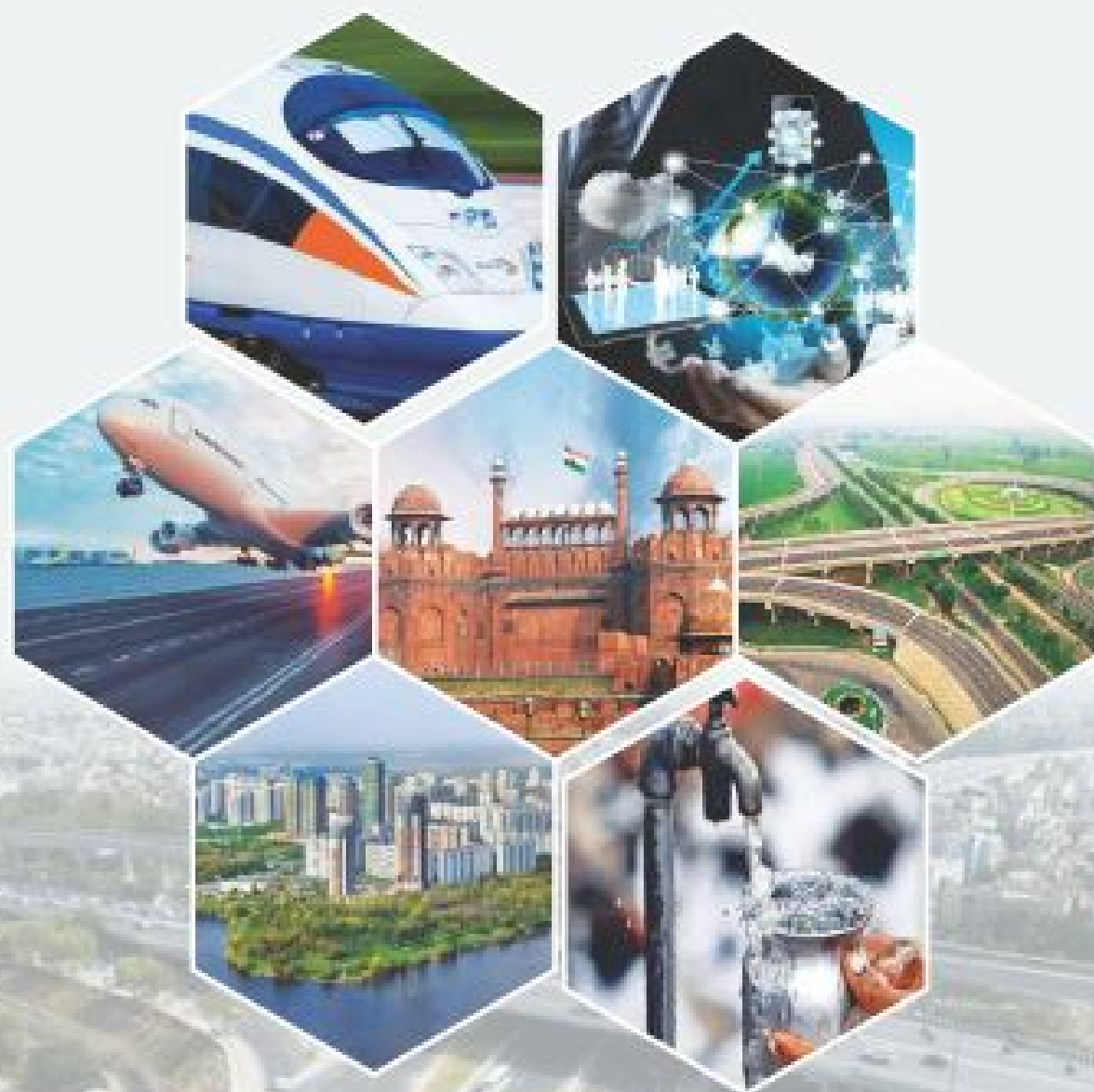


ANNEXURES TO DRAFT REGIONAL PLAN-2041 National Capital Region



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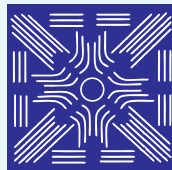
Ministry of Housing and Urban Affairs, Government of India
Core 4B, 1st Floor, India Habitat Centre, Lodhi Road, New Delhi- 110003
Website: <http://ncrphnrc.in>

**ANNEXURES TO
DRAFT REGIONAL PLAN - 2041
NATIONAL CAPITAL REGION**

POLICY ANNEXURES - SECTION-I

DATA ANNEXURES - SECTION-II

December 2021



NATIONAL CAPITAL REGION PLANNING BOARD

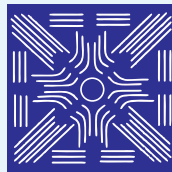
MINISTRY OF HOUSING AND URBAN AFFAIRS, GOVERNMENT OF INDIA
CORE 4-B, FIRST FLOOR, INDIA HABITAT CENTRE, LODHI ROAD, NEW DELHI - 110003

**ANNEXURES TO
DRAFT REGIONAL PLAN - 2041
NATIONAL CAPITAL REGION**

SECTION - I

POLICY ANNEXURES

December 2021



NATIONAL CAPITAL REGION PLANNING BOARD

MINISTRY OF HOUSING AND URBAN AFFAIRS, GOVERNMENT OF INDIA
CORE 4-B, FIRST FLOOR, INDIA HABITAT CENTRE, LODHI ROAD, NEW DELHI - 110003

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CHAPTER-2. DEMOGRAPHY AND SETTLEMENT PATTERN

Indicative broad role of the lower hierarchy of Settlements to be detailed out in Sub-Regional Plans and other lower hierarchy plans

1. **Sub-regional Centre** – these settlements shall generally be medium sized towns or intermediate city performing a variety of roles, particularly in promoting and supporting a more balanced distribution of urban population and in providing functional linkages between the smaller towns and Regional/ Metro Centres. The Sub-regional Centres are proposed to undertake the urban economic and service functions and will have sound infrastructure like transport, power, water, credit banking, marketing, managerial services etc.
2. **Service Centre/ Nodal Points:** These will be settlements with 10,000 to – 99,999 population having linkages with immediate rural hinterlands. These centres would cater to the rural hinterland as agro-service centre in collection and distribution of agricultural goods and services with processing, marketing, warehousing and storage facilities. These settlements would be the Nodal Point for the economy in the micro-regions covering an area of about 15-20 km radius.
3. **Central Village Cluster/ Bazar Villages:** This will include all Settlements with 5,000 to 9,999 population having central location and potential for development within its catchment area, with relatively better services and facilities in terms of education, health, communication, accessibility and has the capacity to serve a group of settlements. These central villages are proposed to provide basic social facilities for population engaged in agriculture and other primary activities. Such villages will have a weekly phenomenon called “Haat” (weekly markets) where people from around 7-8 kms gather either for sale of their local products or as buyers for the non-local products on a weekly basis as suppliers/shopkeepers converge from outside areas to sell products not available/produced in the local area.
4. **Medium Village** - These will be the settlements with 2,000 to 4,999 population having well developed networks with Bazar and would be provided with basic facilities to group of other village. Medium villages shall be having common facilities (eg. post office, senior school, agricultural processing units (atta chakki, ghaani) serving other villages around in an area of about 2-3 km called Small villages.
5. **Small Village** - All other settlements with a population of less than 2,000 have been classified as small villages and would be provided with basic facilities like link roads, water supply and electricity, paved streets and low-cost common sanitary facilities as well as the minimum required social infrastructure as per planning norms.



Annexure P-4.1

CHAPTER 4. ECONOMIC GROWTH

Suggested Policies for Economic Growth in NCR

(i) Farm incomes and traditional economy

1. Revitalising traditional economy (agriculture, diary, cash crops, street vending, etc.)
2. Promote emergence of 'agripreneurs' so that small and marginal farmers can capture a higher share of value addition through agri-market infrastructure, computerization of primary agricultural credit societies, testing facilities, creation of cold chain facilities and mega food parks.
3. Encourage states to undertake agricultural reforms and to provide additional marketing options to farmers to reduce the number of middlemen and to increase farmers' incomes.
4. Every village of 5000 population or every 1000 households in big village in rural areas should have one milk booth. In urban area every group housing, RWA, should have one milk booth and every ward should have 02 booths at least. A scheme/ provision for space be made in respective local area plans of rural and urban area.
5. Initiatives of Haryana like 'Dudh ki Chakki' should be replicated in other the NCR constituent states. Aspect of 'dry dairy' and 'dry dairy farming' should be introduced and followed up in order to support economic viability in the dairy sector when the bovine stop giving milk.
6. Special efforts are required for providing primary processing facilities and marketing linkages for fruits, vegetables and livestock products as they offer better income. These products are also necessary for non-cereal dietary requirements of NCR population.

(ii) Ease of Doing Business

7. Aspects that could be considered while adopting Ease of Doing Business (EoDB) across NCR may include Starting a business, construction permits, power connections, property registration, credit availability, etc. List of suggestive indicators as per World Bank are placed at Annexure-P-3.4.
8. States to ensure the seamless integration of the Shram Suvidha portal and State agencies' portals for all labour related matters.

(iii) Logistics

9. For achieving objectives of the National Logistics Policy, NCR States should work to (i) Reduce Cost of logistics to 10% from 13-14% of GDP, (ii) Help the country to Improve India's rank in LPI to <30, (iii) Contribute to Logistics employment generation and help in achieving the country target of creating additional 10-15 Million jobs, (iv) Facilitate Single point for all logistics data in the NCR coordinated with rest of country, and (v) Strengthen Warehousing industry and improve Cold Chain efficiency reduce agri-losses to <5%.
10. In addition the following should also be done:
 - a) Warehouse directory with Geo-tagging of all warehouses/ godowns in NCR be prepared by NCR States.
 - b) Viability Gap Funding (VGF) to be provided for setting up of warehousing at the block/ taluk levels on PPP mode. Food Corporation of India, Central/ State Warehousing Corporations to also offer their land for this purpose.
 - c) Refrigerated vans may be attached to passenger trains to promote quick movement of perishables.
 - d) Krishi trains can also be run on PPP mode.
 - e) Krishi Udan scheme may be promoted/ launched whereby horticulture and perishable commodities can be transported through the air-route.



- f) Financing of negotiable warehousing receipts to be encouraged along with its integration with e-NAM
- 11. Multi-chambered, differential temperature controlled cold storages for non-potato/onion based Fruits, vegetables and flowers will still be required at central sale points/ Terminal Markets, to prevent wastage, be planned.
- 12. To prevent post-harvest loss, adequate initiatives should be taken to provide infrastructure for short-term storage (particularly at the farm level) and for intermediate processing in the production catchments.
- 13. Special facilities both for transfer, storage as well as after use treatment should be planned for flowers grown for economic purpose.
- 14. Production zones should be created and promoted in urban areas in the NCR as cities and towns have a huge daily demand for fruits and vegetables. Further, region has advantage of better logistics in terms of transportation and storage facilities, air connectivity, etc. and this should be exploited to the extent possible.

(iv) Tourism

- 15. Plan and develop 4-5 globally competitive and world-class Tourism circuits from entry to exit. Specific policy regarding tourism sector be referred in chapter on “Tourism and Heritage”.
- 16. Make NCR the first choice for domestic and foreign tourist visitors by improving the overall experience through excellent tourist infrastructure, facilities, and hospitality services. Efforts may be made in the direction of upgrading existing infrastructure and leasing out the maintenance of such infrastructure to private players and developing new destinations using PPP model.

(v) Skilling and Employment Synergy

- 17. The huge potential of Handicraft-based informal sector to improve incomes in the region be benefited from.
- 18. Employability of labour needs to be enhanced by improving health, education and skilling outcomes and a massive expansion of apprenticeship scheme. A large part of jobs are expected to be generated in labor-intensive manufacturing sectors, construction, and services and States should work towards effectively managing the same.
- 19. Encourage increased formalization of the labour force by reforming labour laws, easing of industrial relations and ensuring of fair wages, working conditions and social security through significant productivity improvements in the economy.
- 20. NCR states to take necessary actions that generate about 10-15% (7-10 lakh) of the total job requirements as estimated by the NITI Aayog Report (2019) for the country.
- 21. A Labour (Workforce) Management Information System maintaining records regarding migratory workers, uncertified & informally trained workforce and those required to be skilled etc. should be created, so that the industry is better equipped for skilling.

(vi) Quality, Technology and Innovation

- 22. Promote in a planned manner the adoption of the latest technology advancements, referred to as ‘Industry 4.0’ (refer Annexure-P-3.6) in NCR, in order to contribute towards doubling manufacturing sector growth rate by 2025 as per national target.
- 23. With the objective of being competitive and leveraging international trade agreements, NCR States may harmonize their quality standards for all sectors with global standards. States may collaborate with BIS and QCI and assess improvements in standards and productivity required.
- 24. Urban spaces like roof tops, terraces, buildings, and colonies should be used for producing vegetables (terrace or kitchen gardening) and vertical farming should be promoted to support urban agriculture.



(vii) **Circular Economy**

25. Concept of 'nothing is waste' should be adopted through technological interventions. The concept of 'circular economy' to use wastes as raw materials or resources should be implemented on priority. Specialized plants can be set up across the region with state-of-the-art technologies to utilize various types of wastes as raw material, generated within NCR and even outside NCR.

Suggested Policies for Economic Growth which could be elaborated in Sub-Regional Plan, District Development Plans and Master/ Development Plans

- 1) Proposed Industrial corridors & Economic hubs which are better connected and more competitive should have:
 - (a) Prioritised public transport investments to deliver 30-minute city objective for strategic centres along the economic corridors,
 - (b) Prioritised transport investments that enhance access to economic corridors & between centres, &
 - (c) Co-located health, education, social & community facilities in strategic centres along economic corridors.
- 2) Integration of two elements i.e. economic activities and social activities should be kept in mind while planning at local level in all sub- regions. Planning from investment perspective should be done based on the DNA/ character of the city or area. Land-use system and the permission to approve should be automatic/time bound manner.
- 3) Following infrastructure should be developed on priority:
 - (i) Increase coverage & quality of roads/ to enhance connectivity & internal & external trade. EPE & WPE be used as growth corridor synchronising CNCR with rest of NCR.
 - (ii) By 2025, NCR should have a rail network that is not only efficient, reliable and safe, but is also cost-effective and accessible, both with respect to the movement of people and goods. Augment the capacity of existing railway infrastructure. All tracks in NCR should be made high speed. Further, develop networks of mass rapid transport system like extension of Delhi Metro to other towns, RRTS and Orbital Rail.
 - (iii) Enhance availability and affordability of International & Regional air connectivity. More transshipment hubs should be created in NCR e.g. at CMAs like Hisar and Jaipur. Improve flight connectivity to tourist destinations. Cities and towns across NCR should be well connected with larger cities like Delhi, Mumbai, Kolkata, Bangalore, Ahmadabad & Chennai and such cities should be converted into efficient and seamless transit hubs.
 - (iv) Develop Inland Water Transport (IWT), water sports and water related tourism by Rejuvenating Yamuna, other natural channels & water bodies across NCR.
 - (v) Physical digital connectivity across all districts, cities/ towns and Gram Panchayats (GPs) across NCR should be ensured through OFC/ WiFi connectivity by 2025 with delivery of government services digitally by 2022-23. (For details, refer Chapter 16 Digital Infrastructure).
 - (vi) NCR participating States & their agencies should act towards improving business environment for logistics & warehousing sector specifically to stimulate economic activity in urban centres, and their rural hinterland to promote 'Make in India'.
- 4) Areas which require razor focus to create and sustain economic growth are as follow:
 - (i) **Sustainable Infrastructure-** Invest in development of infrastructure capable of adapting to population growth while maintaining high quality of life
 - (ii) **Sustainable Environment-** Use of smart technologies to map areas prone to higher degrees environmental degradation to achieve more sustainable urbanization
 - (iii) **Social Inclusiveness-** Allow more community engagement and equitable redevelopment
 - (iv) **Embrace Technology-** Develop strategy to adapt to and leverage changing digital ecosystem led growth



- (v) **Education-** Leverage educational institutions to develop and attract talent for next wave of digital led growth
- (vi) **Build Circular Economy-**Develop strategy to achieve circular economy led by reuse-recycle-replenish of materials consumed.
- 5) For income generation, well synchronized areas which are of Central and State interest should be identified for joint investments and FDIs. Reforms undertaken at the Centre and State level should be implemented in a time bound manner. Reforms undertaken by centre must be implemented at states and reforms undertaken by states should be implemented by the districts.
- 6) Expand the Region's Connections to the Global Economy by: (a) Promoting international trade and increase exports from the region, (b) Attracting additional foreign direct investment, (c) Improving domestic and international mobility connections to the nation and world. Expand production capacity and improve international connections, (d) Enhancing utilization of the region's dry ports and overall leverage of the region's multimodal infrastructure, (e) Enhancing region's desirability to both employers and employees by investing in arts, cultural, and recreational amenities; supporting entrepreneurs and innovative thinkers; improving environmental quality; maintaining affordable housing opportunities; and investing in public infrastructure, & (f) Supporting efforts to make NCR a world-class region.
- 7) Expedite the Development of Modern Service Industries by: (a) Developing NCR as a financial hub - develop special financial products & services promoting mutual financial markets access, (b) Developing a system of modern service industries by - (i) promoting specialization & progression towards high end of value chain for producer services such as business services and distribution services, refine and improve the quality for consumer services such as healthcare services and family services, focus on logistics services, travel services, cultural and creative industries, human resources services, convention and exhibition and other professional services, etc., and develop as system of modern services which promotes coordinated development, complementarity and cooperation, (ii) Promoting cooperative development of logistics services among major Cities, vigorously pursue development of logistics and cold chain logistics, raise the level of supply chain management, and develop NCR as a logistics hub, (iii) Supporting efforts in development of Agro-food processing sector, (iv) leveraging the strengths and expertise of NCR talents in the film and television industries, promote cooperation among the film and television industries, & (v) Consolidating and enhancing NCR status as a high-end convention, exhibition and sourcing centre, globally.
- 8) Industrial estates based on agriculture should be setup on agriculture land which can support food processing units. Also, the non-polluting industries migrating from Delhi should be established in sub-regional areas, which have ample land.
- 9) Identify key sectors and work with academic institutions, business incubators, venture capitalists, and others to attract or create new companies while simultaneously supporting and expanding existing companies in those sectors.
- 10) There are new opportunities like defence production & aerospace sector. Future of mobility has changed and new dimensions such as energy efficient products, green technologies, service skilling, etc., have emerged. Products for women, millennial, finance and health are new age requirements. Fintech, data analysis, artificial intelligence are amongst others. Hence, related business, Institutes & Industries to support this kind of requirement need to be set up in region.
- 11) Action should be taken for improving business environment for logistics sector specifically to stimulate economic activity in urban centres and their rural hinterland should be boosted to promote 'Make in India' program of Govt. of India. At the same time, agricultural productivity and income should be improved through farmer / producer/ APMC/ marketing nexus using ENAM platform in a regional and pan India context to network and create stakeholders.
- 12) New schemes be rolled out for MSME promotion & Employment Generation in NCR:(a) One District One



Product (b) Entrepreneurship Development, (c) New Skill Development Center at regional & sub-regional level, (d) Schemes for Eco-friendly non-polluting industries, (e) Incentive schemes for Food Processing Park & IT Park at sub-regional level.

- 13) In the MSMEs Sector, a serious fall in demand as many micro-industries cannot cope with the changing consumer preference and many units close down as they are unable to repay their debts. In this regard, following Strategies be taken into consideration:
 - (i) To decrease cost of production in MSMEs, governments should ensure smooth and constant supply of power and water to these units. Constructing plug and play complexes to accommodate MSMEs could ensure an efficient supply chain for inputs.
 - (ii) Ensure availability and wide disbursal of formal credit to micro enterprises along with credit schemes focused on female entrepreneurs. Loan be easily available for MSMEs.
 - (iii) Start-ups to be promoted through government Incentives to boost employment
 - (iv) Policies, guidelines, schemes of GoI and NCR States related to various sectors should be timely implemented in all NCR districts to benefit from convergence of different schemes.
 - (v) New Common Facility Center for MSMEs be established at regional and sub-regional levels and previously established CFC Centers 'be improved so that SME can be benefitted.
- 14) Following aspects should be considered to improve the industries and MSMEs Sector in NCR:
 - (i) Air Taxi must be started in NCR. Proposed Airport of Meerut should be developed fast.
 - (ii) Micro, Small & Cottage Industries in Villages of NCR should be promoted with provision of rebate, less obligations and statutory requirements.
 - (iii) As RRTS is going from Delhi to Meerut, it should provide connectivity at regional level as well as at sub-regional level in NCR. If it is laid out with establishment of commercial activity centers / hubs for Small Scale Industries & Residents, this may help growth engine thus generating income & prosperity.
 - (iv) Regional Exhibition Center based on local products and Warehouses be established in each sub-region, with easy commutation & connectivity to Rail, Metro and National Highways.
 - (v) Sub-Region wise Container depot should be established in NCR, and along with it, Freight Corridor should relate to the sub-container depot.
- 15) Micro Enterprises play important role in employment and income generation. Micro enterprise, has two parts - livelihood and services. Necessary actions should to be taken to improve the condition of Micro Enterprises.
- 16) Publicize, at home and abroad, traditional crafts and agricultural produce harvested in NCR, to promote the NCR brand.
- 17) Railway station of Partapur, Meerut should be fully developed.
- 18) Due attention should be given by all concerns towards development of logistics in line with existing potential, future expectations, wholesale Market policy of Ministry of Commerce, Govt. of India and follow up policies of Haryana, Rajasthan and UP. It should cover start-ups, incentives on investment, fiscal (stamp duty/electricity duty) concessions, and interest subvention, development of e-Market place, Retail Centres, Cross-regional trade, e-Commerce platform and viability gap funding. These initiatives can minimize costs in logistics to the tune of 10% to 12%. Further, the development of suitable logistics (warehousing and transportation etc.) may reduce agricultural waste from current line of 25-30% to 20-25%. It will minimise rural urban divide and imbalance in the regional development¹.

¹ IIPA, Review Report recommendation



- 19) Four things having impact on business are globalisation, technology, sustainability & scalability. In case of automobile sector, now the electric vehicles are becoming the priority. Study says that India has 22 cars per 1000 people. Compared to BRIC countries, China has 179, Brazil as 360, Russia has more than 300 cars. Changing the fuel from diesel / petrol to electric, about 2000 parts of a normal car would become redundant. Lot of other industries, not related will have to close down. Therefore, alternatives be planned for such industries.
- 20) Support and promote the growth of key economic sectors, including Tourism. Substantial concentration is required on tourism activities. Policies to develop tourism sector for economic growth, parking and other tourism facilities should be addressed at Sub-Regional Plans.
- 21) Consider the following when preparing plans for tourism and visitation:
 - (i) encouraging the development of a range of well-designed and located facilities
 - (ii) enhancing the amenity, vibrancy and safety of centres and township precincts, improving public facilities and access and supporting appropriate growth of the night-time economy
 - (iii) supporting the development of places for artistic and cultural activities
 - (iv) protecting heritage and biodiversity to enhance cultural and eco-tourism
 - (v) developing industry skills critical to growing the visitor economy
 - (vi) Incorporating transport planning to serve the transport access needs of tourists.
- 22) Local craftspersons, masons, carpenters and labourers should be engaged for heritage conservation & restoration activities to create jobs. Support private sector institutes in tourism regulated by government to create required talent pool. This can be done by expanding the number of private sector institutes or bodies recognized as implementing agencies for delivering Ministry of Tourism's 'Hunar Se Rozgar Tak' initiative to create employable skills.
- 23) There is high labour productivity in sectors such as electricity, water and gas, finance, real-estate and communications. However, other sectors witness modest to low productivity. Low work force participation rate (WFPR) implies low per capita savings and low standards of living. To tackle these major strategies include – (a) Formalization of informal sector activities, to ensure disbursement of benefits to all workers who are eligible for government's labour welfare programmes, (b) Establishment of Plug and Play manufacturing zones complete with basic infrastructure facilities (power, water, sewage, Effluent treatment, roads, security) for in-house industries as well as housing, skill development and healthcare for workers, (c) Promotion of females in workforce, ensuring equal pay for equal work at all levels. Make work spaces gender sensitive, and including day care centres within these spaces could foster female inclusion.
- 24) In order to enhance skills of youth necessary training should be imparted and World Class Skill Centres, Schools designed with specific curricula to teach crafts like handloom & handicrafts should be established at sub-regional/ district level. Vocational training & internship programs be designed at district level to push for innovation and entrepreneurship right from the school level. Annual roster can be prepared for such skilling & training programs. Create spaces for skilling centres. Make sure new spaces for education are connected from urban space around. NCR should be prepared for the world to upscale and re-skill life.
- 25) Best practices and innovations of local governments in the region, nation and elsewhere be suitably shared. NCR Local Forum (NCRLF) be created to involve local government's interaction and sharing of experience & expertise on different aspects of economic development. The forum should have Annual Work Plan activities covering meetings, fairs, workshops, seminars, research and capacity building.



Annexure P-4.2

Suggested Policies Power and Energy Efficiency

1. NCR States should assess the related technological options, introduce Time of Day (ToD) metering, and regulatory issues for peaking.
2. It is critical to identify sufficient reserve power capacities for contingencies.
3. States may explore possibilities of converting old thermal units in States into Synchronous Condenser (help in Inertia & dynamic VAR).
4. Initiatives be taken to promote solar inverters and other energy storage systems with grid forming capability. Further, HVDC Voltage Sourced Converters (VSC) be considered due to their black-start capabilities.
5. Efforts may also be made towards re-conductoring of existing transmission lines with higher capacity conductors.
6. States should coordinate with CEA to ensure FGD installation in all thermal power plants.
7. Provide “**priority sector status for Second Generation (2G) bio-ethanol projects**” whose feedstock includes agricultural residues like rice, wheat straw, etc.
8. NCR’s spaces over extensive network of irrigation canals like Agra canal, Eastern Yamuna canal, Upper Ganga canal, Western Yamuna canal etc.may be explored to put solar panels which would meet the twin objectives of reducing the evaporation and production of clean energy.
9. NCR States may introduce/ update/ amend their building codes to promote and provide clarity for Solar Energy harvesting and its roof rights, as applicable.
10. State Governments have to ensure accountability of the DISCOMS and explore possibilities of discounting the consumers for load shedding. Adequate measures be taken to improve the financial health of DISCOMS and to bear the financial burden arising from the AT&C losses beyond the base mark of 15%.
11. Power Utilities in NCR should prepare a bankable distribution plan clearly defining the road map to augment their distribution system to match the expected load demand of the area and to identify land for sub-stations and their timely acquisition also, as to avoid time lag in commissioning of the projects. They may approach NCRPB or other financial institutions like Banks, REC, PFC, World Bank, ADB etc. for funding of their distribution infrastructure.
12. Aggregate Technical & Commercial (AT&C) loss and T&D (Transmission & Distribution) loss, reduction road map be prepared and implemented by each of the NCR States as part of their Sub-Regional Plans. NCR States should take necessary initiatives to improve the health of DISCOMS.
13. State Sector generation projects power evacuation system is to be planned and implemented by respective State Transmission Utilities (STUs) through:
 - (i) Improvement of T&D system through proper augmentation.
 - (ii) Promotion of Cross-border electricity trade.
 - (iii) While current ISTS cater to power transfer requirement till 2025, further phasing of ISTS should be worked out on five year interval till 2041 in the respective Sub-Regional Plans by the NCR States in consultation with CEA/ MoP.
14. **UP has estimated its requirement** (new substations and infrastructure) for sub region with a total cost of Rs.68,720 crore (Refer **Para 31 below**). **Delhi** has recently worked out proposal for power transmission/ distribution systems improvements (Refer **Appendix 4.5 of RP Main Document**) Other NCR states should also prepare such detail Plans in their SRPs.



15. Digital infrastructure, control systems and information technology need to be introduced and optimally utilized for efficient delivery and monitoring of power.
16. Implementation of various renewable energy options for example Solar energy, Hybrid renewable energy systems such as solar PV+ biomass, Commercial biogas, wind, hydrogen, etc. need to be explored and promoted
17. Setting up of Solar Parks can be done based on studies of solar power potential, by the concerned agencies of the Central Government or NCR States. If necessary, the solar potential of NCR sub-regions can be re-evaluated by engaging agencies like National Institute of Solar Energy, etc. The load pattern of NCR cities like Noida, Gurugram and Delhi can be matched with solar profile to address the peak demand of the cities (around afternoon) mainly due to Air conditioning load. As per land availability the solar installations need to be promoted to reap the benefits of renewable energy.
18. If sufficient roof capacity is not available, the land available in societies, farm houses, etc. can be used for surface mounted solar panels. Ground mounted and solar roof top especially on all Government buildings and vacant roof tops need to be promoted.
19. Make Open Access market viable for procurement of power so as make the sector competitive. For power procurement, DISCOMS need not consider the demand of open access consumers; however, the same would have to be considered for augmentation of network by the DISCOMS/States.
20. Actions need to be taken up by the concerned States/SERCs for improving the financial health of DISCOMs like Rationalization of tariff to reduce gap between average revenue realized (ARR) and actual cost of supply (ACS), Adequate investment to strengthen distribution network, Formulation of Enforcement Strategy to prevent theft, Real time energy accounting and auditing Adoption of enhanced revenue management techniques, Timely payment of subsidy and gradual reduction of the same, Managerial intervention and bringing accountability, Cooperation from employee and Sound financial restructuring plan.
21. Demand Side Management (DSM), Energy Conservation & Efficiency Improvement programmes initiatives need to be popularized so that the consumer can participate in DSM measures undertaken by DISCOMs.
- 22.. In 2008, the Ministry of New and Renewable Energy, the Government of India have launched Green Rating for Integrated Habitat Assessment (GRIHA). GRIH Arating standards have been incorporated the provisions of the NBC 2005, ECBC, and other Indian Standard codes.
23. Bureau of Energy Efficiency (BEE) may formulate strategy for NCR 2041 on energy efficiency in various sectors and specify energy consumption norms. BEE may also develop MSME cluster-specific programmes for energy intensive industries in NCR to introduce energy efficient technologies.
24. State Designated Agencies (SDAs) need to be more empowered and provided with adequate resources to implement EE related programmes. There is a need to ensure greater participation of Energy Service Companies (ESCOs) using appropriate financing models with a risk sharing mechanism, particularly by public sector banks.
25. NCR States should adopt the latest version of the Energy Conservation Building Code (ECBC) in their building by-laws and ensure faster implementation in their respective sub-regions.
26. Widen and deepen the Perform, Achieve and Trade (PAT) scheme and make Energy Saving Certificate (ESCert) trading under the PAT scheme effective in NCR by ensuring strict penalties against defaulters.
27. NCR States may come up with specific norms of 'Energy Intensive Industries' and new/ old industries should follow these norms by adopting appropriate measures/ technologies. Energy Intensive Industries be permitted after ensuring that energy consumption norms are provisioned for.



28. Suggested Demand Side Management (DSM) Solutions

- i. Mandatory use of ISI marked motor pump sets, power capacitors, and foot-reflex valves in the agricultural sector.
- ii. Prepare Detailed Project Reports (DPRs) for municipal DSM programmes.
- iii. Adoption of the mandatory Energy Conservation Building Code (ECBC) in all government buildings and in all new building projects. Effective implementation of ECBC with the help of architects and BEE empanelled consultants. Changes in the building bye-laws to incorporate ECBC.
- iv. Energy efficiency of existing government buildings through retrofitting to be carried out so as to achieve at least a rating of one-star from BEE under their building labelling programme.
- v. Promotion of energy efficient building design
- vi. Mandatory use of CFLs and electronic chokes in government buildings / government aided institution / boards and corporations. Mandatory use of T-5, 28 Watt tube-lights in government buildings and government-aided institutions/corporation.
- vii. Mandatory use of solar water heaters in NCR in different categories of buildings like industries, hotels, hospitals, canteens, corporate and residential building having an area of 500 sq.m. or above, government buildings, etc.
- viii. Promotion of CFLs/LEDs in all buildings, as well as for street lightings, hoardings, and advertisements.
- ix. Effective utilisation of SECF for energy conservation in small and medium enterprises (SMEs), energy audits, capacity building, etc.
- x. Subsidy for promoting battery operated vehicles.
- xi. Implement scheme on an interest free loan for energy conservation measures.
- xii. Energy audits of government buildings, industries and commercial establishments
- xiii. Time of Day tariffs²
- xiv. Power Factor Surcharge/Incentive
- xv. Awareness programmes
- xvi. Pre-paid Meters
- xvii. Efficient lighting programmes
- xviii. Load Research

29. **Indicative Suggestions for Reducing Losses in Distribution & Transmission Lines** - It is fact that the unit of electric energy generated by power station does not match with the units distributed to the consumers. Some percentage of the units is lost in the distribution network. This difference in the generated & distributed units is known as transmission and distribution loss. Distribution Sector considered as the weakest link in the entire power sector. Transmission losses are approximately 17% while distribution losses are approximately 50%. There are two types of transmission and distribution losses i.e. Technical losses and Non-Technical (Commercial Losses) losses³. Various methods & steps to reduce these losses are suggested as follows:

29.1 Reducing Technical Losses

- (i) **Converting LV Line to HV Line-** Many distribution pockets of low voltage (430V) in town are surrounded by higher voltage feeders. At this lower voltage, more conductor current flows for the same power delivered,

² Source: <https://www.prayasapune.org/peg/publications/item/281-demand-side-management-in-india-an-overview-of-state-level-initiatives.html>

³ <https://www.electricalindia.in/losses-in-distribution-transmission-lines/>



resulting in higher I²R losses. Converting old LV (430V) feeders to higher voltage the investment cost is high and often not economically justifiable but if parts of the LV (430V) primary feeders are in relatively good condition, installing multiple step-down power transformers at the periphery of the 430 volt area will reduce copper losses by injecting load current at more points (i.e., reducing overall conductor current and the distance travelled by the current to serve the load).

- (ii) **Large Commercial / Industrial Consumer get direct Line from Feeder** - Design the distribution network system in a way that large consumer gets direct power line from feeder.
- (iii) **Adopting High Voltage Distribution Service (HVDS) for Agricultural Customer** - In High Voltage Direct Service (HVDS), 11KV line direct given to cluster of 2 to 3 Agricultural Customer for Agricultural Pump set and employed small distribution Transformer (15KVA) for given these 2 to 3 customers through smallest (almost negligible) LT distribution lines. In HVDS, there is less distribution losses due to minimum length of distribution line, high quality of power supply with no voltage drop, less burn out of motor due to less voltage fluctuation and Good quality of Power, to avoid overloading of transformer.
- (iv) **Adopting Arial Bundle Conductor (ABC)** - Where LT Lines are not totally avoidable use Arial Bundle Conductor to minimize faults in lines to avoid direct theft from line.
- (v) **Reduce Number of Transformer by methods like** reducing the number of transformation steps.; Transformers are responsible for almost half of network losses; High efficiency distribution transformers can make a large impact on reduction of distribution losses.
- (vi) **Utilize Feeder on its Average Capacity**- By overloading of distribution feeder, distribution losses will be increased. The higher the load on a power line, the higher its variable losses. It has been suggested that the optimal average utilizations rate of distribution network cables should be as low as 30% if the cost of losses is taken into account.
- (vii) **Replacements of Old Conductor or Cables** - By using higher cross-section area of conductor / cables, losses will be lower but at the same time cost will be high. So, by forecasting future load, an optimum balance between investment cost & network losses should be maintained.
- (viii) **Feeder Renovation / Improvement Program**: Due to Feeder Renovation Program T&D loss may be reduced from 60-70% to 15-20%.
 - a) Reconductoring of Transmission and Distribution Line according to Load.
 - b) Identification of weakest areas in the distribution system and strengthening or improving them.
 - c) Reducing the length of LT lines by relocation of distribution sub stations or installations of additional new distribution transformers.
 - d) Installation of lower capacity distribution transformers at each consumer premises instead of cluster formation and substitution of distribution transformers with those having lower no load losses such as amorphous core transformers.
 - e) Installation of shunt capacitors for improvement of power factor.
 - f) Installation of single-phase transformers to feed domestic and nondomestic load in rural areas.
 - g) Providing of small 25kVA distribution transformers with a distribution box attached to its body, having provision for installation of meters, MCCB and capacitor.
 - h) Laying direct insulated service line to each agriculture consumer from distribution transformers.
- (ix) **Industrial / Urban Focus Program**
 - a) Separations of rural feeders from industrial feeders
 - b) Instant release of New Industrial or HT connections



- c) Identify and replace slow and sluggish meters by electronics type meters.
- d) In industrial & agricultural consumer adopt one consumer, one transformer scheme with meter.
- e) Change old service line by armoured cable and tighten Joints, Wire to reduce leakage current.
- f) Strictly follow Preventive Maintenance Program of Line to reduce Losses due to Faulty /Leakage Line Parts.

29.2 Reducing Non-Technical Losses

- (i) Mapping of complete primary and secondary distribution system with all parameters such as conductor size, line lengths etc. Compilation of data regarding existing loads, operating conditions, forecast of expected loads etc. is also important. Preparation of long-term plans for phased strengthening& improvement of distribution systems along with transmission system.
- (ii) **Implementation of Energy Audits Schemes** - It should be obligatory for all big industries and utilities to carry out energy audits of their system. Further, time bound action for initiating studies for realistic assessment of the total T&D losses into technical and non-technical losses has also to be drawn by utilities for identifying high loss areas to initiate remedial measures to reduce the same. The realistic assessment of T&D loss of a utility greatly depends on the chosen sample size which in turn has a bearing on the level of confidence desired and the tolerance limit of variation in results. In view of this, it is very essential to fix a limit of the sample size for realistic quick estimates of losses.
- (iii) **Mitigating power theft by Power theft checking Drives**
 - a) Theft of electric power is a major problem faced by all electric utilities. It is necessary to make strict rule by state government regarding power theft. Indian Electricity Act has been amended to make theft of energy and its abetment as a cognizable offence with deterrent punishment of up to 3 years imprisonment. The impact of theft is not limited to loss of revenue, it also affects power quality resulting in low voltage and voltage dips.
 - b) Required to install proper seal management at meter terminal box, at CT/PT terminal to prevent power theft. Identify power theft area and required to expedite power theft checking drives.
 - c) Installation of medium voltage distribution (MVD) networks in theft-prone areas, with direct connection of each consumer to the low voltage terminal of the supply transformer.
 - d) All existing unmetered services should be immediately stopped. Replacement of Faulty/Sluggish Energy Meter
 - e) It is necessary to replace faulty or sluggish meter by distribution agency to reduce unmetered electrical energy.
 - f) Required to test meter periodically for testing of accuracy of meter. Replacement of old erroneous electromechanical meters with accurate electro static meter (Micro presser base) for accurate measurement of energy consumption.
 - g) Use of meter boxes and seals them properly to ensure that the meters are properly sealed and cannot be tampered.
- (iv) **Bill Collection Facility**
 - a) Increase bill's payment cells, increasing drop box facility in all area for payment collection.
 - b) E-payment facility gives more relief to customer for bill payment and supply agency will get payment regularly and speedily from customer.
 - c) Effectively disconnect the connection of defaulter customer who does not pay the bill rather than give them chance to pay the bill.
- (v) **Reduce Debit areas of Sub-Division**
 - a) Recovery of old debts in selected cases through legal, communication and judicial actions.



- b) Ensuring police action when required to disconnect connection of defaulter Consumer.
- (vi) **Watchdog Effect on Users**
 - a) Users must aware that the distribution Agency can monitor consumption at its convenience. This allows the company fast detection of any abnormal consumption due to tampering or by-passing of a meter and enables the company to take corrective action.
 - b) The result is consumer discipline. This has been shown to be extremely effective with all categories of large and medium consumers having a history of stealing electricity. They stop stealing once they become aware that the utility has the means to detect and record it.
 - c) These measures can significantly increase the revenues of utilities with high non-technical losses.
- (vii) **Loss Reduction Programmed-** The increased hours of supply to agriculture and rural domestic consumers have resulted in higher loss levels.

30. Suggested measures regarding energy conservation and reduction of carbon emissions

30.1 Energy Conservation Activities:

- i) Efficient development control regulations and building byelaws from the point of view of energy efficient design should be considered. The legal framework for promoting energy conservation activities should be adopted and implemented across NCR which includes: Standards and Labeling for appliances & equipment, Energy Consumption norms for energy intensive industries, DSM programs, ECBC for commercial buildings, & Certification of Energy Auditors and Managers.
- ii) Adoption and effective implementation of mandatory ECBC in all government buildings and new building projects, with the help of architects and BEE empaneled consultants. Changes in the building bye-laws to incorporate ECBC; energy efficiency of existing government buildings through retrofitting to be carried out so as to achieve at least a rating of one-star from BEE under their building labeling programs ; Promotion of energy efficient building design; Efficient lighting programs - Mandatory use of T-5, 28 Watt tube-lights, CFLs/LEDs electronic chokes in government buildings / government aided institution / boards and corporations, s CFLs/LEDs in street lightings, hoardings, and advertisements; solar water heaters in different categories of buildings like industries, hotels, hospitals, canteens, corporate and residential building having an area of 500 sq.m. or above, government buildings, etc. Effective utilization of SECF for energy conservation in small and medium enterprises (SMEs), energy audits, capacity building, etc.; Subsidy for promoting battery operated vehicles; Implement scheme on an interest free loan for energy conservation measures; Energy audits of government buildings, industries and commercial establishments; Time of Day tariffs⁴³; Power Factor Surcharge/Incentive; Awareness programs; Pre-paid Meters and Load Research are the other measures that can be implemented.
- iii) As per the report of the Sub-Committee for development of National Sustainable Habitat parameters for energy efficiency in residential and commercial buildings, 15% of the total external lighting load should be met through renewable energy and for commercial/ institutional/ industrial / mixed use buildings, 5% of the total lighting load should be met through renewable energy sources (solar, wind, biomass, fuel cells and so on). Further, there should be development of city level Energy Efficiency (EE) and Renewal Energy (RE) policy actions. Similar to the leadership in Energy & Environmental Design (LEED) rating system (practiced globally), the LEED-India promotes a whole building approach to sustainability by addressing performance in the five areas of (a) sustainable site development (b) water savings (c) energy efficiency (d) materials selection (e) indoor environmental quality. It also meets the specifications of ECBC 2007, NBC 2005, MoEF Guidelines, and CPCB norms.

30.2 Reduction of Carbon Emissions:

- i) Increased ratio of renewable energy sources in primary energy sources needs to be integrated. Efforts should



be made to reduce total carbon emission in a phased manner; Targets for all NCR states set by the Ministry of New and Renewable Energy (MNRE), Govt. of India should be followed (refer Annexure-D-4.3.1); Local governments should allow and promote renewable energy systems in zoning, building, design guidelines, and energy codes and explore bulk purchasing options; Promote eco-houses, energy-saving measures at buildings and factories, and the conversion of metropolitan facilities to zero-energy buildings across all sub-regions. NCR States may adopt, promote and set annual targets for getting 'Green Rating' for all buildings and accordingly work towards Zero-Energy Building (ZEB) i.e. buildings with zero net energy consumption through energy efficiency and use of renewable energy and should also aspire and explore options for utilization of 'Hydrogen Energy' wherever possible.

- ii) Installation of Flue Gas Desulfurization (FGD) for reduction of SO₂ is necessary to be complied with under new environment norms regarding emission of flue gases in and CEA has to closely monitoring its implementation at thermal generation stations. A provision for TOD in cities should be considered, as it encourages high density and mixed land use development overall reducing the travel demand and in turn reducing the carbon footprints. Adoption of green transport models through a combination of Promotional, Regulatory and Fiscal Measures.

31. District wise proposal for electrical networks in U.P. sub-region

Overall proposal for electrical networks (new sub-stations and infrastructure required to be added) includes the following:

- 33/11 KV sub-stations (total no. 926 & total cost Rs. 5986 Cr.)
- 33 KV line (total length 8480 km & total cost Rs. 6546 Cr.)
- 11 KV feeder (total length 13462 km & total cost Rs. 9933 Cr.)
- Underground Cable (total length 13000 km & total cost Rs. 14550 Cr.)
- AB Cable (total length 36500 km & total cost Rs. 5850 Cr.)
- Distribution T/F (total No. 87280 & total cost Rs. 15355 Cr.)
- Auto Re-closer / RMU with SCADA work (total No. 7035 & total cost Rs. 10500 Cr.)

31.1 UP sub region District wise details are as provided below:

Table P-4.2.1: Proposal for Electrical Networks of UP sub-region of NCR - 2041																	
DISCOM Name: PUVNL																	
S. No.	Name of Districts No.	132/ 220 KV Sub-station	33/11 KV Sub-station	33 KV Line	11 KV Feeder				AB Cable		Distribution T/F		Auto-Reclosure / RMU with Scada Work				Total Amount
		No.	Amt.	No.	Amt.	Km.	Amt.	Km.	Amt.	Km.	Amt.	Km.	Amt.	No.	Amt.	No.	Amt.
1	G.B. Nagar			146	792	980		1650	5640	2400	2400	3000	450	6480	2440	1200	15667.00
2	Ghaziabad			150	1080	1800		2400	2400	3100	4650	7500	1500	21600	7800	2600	25130.00
3	Shamli			90	630	720		1260	270	1200	1200	3000	450	7500	675	250	5150.00
4	Muzaffarnagar			160	1120	1280		2240	480	1600	1600	4000	600	9000	850	500	5280.00
5	Baghpat			75	480	690		1500	315	900	900	3000	450	8400	660	135	3305.00
6	Meerut			100	700	1200		2100	450	1400	1400	3000	450	13500	1275	1300	5153.00
7	Hapur			60	420	480		840	138	1000	1000	6000	900	7500	675	400	3673.00
8	Buland-shahr			145	764	1330		1472	240	1400	1400	7000	1050	13300	980	650	5362.00
Total				926	5986	8480		13462	9933	13000	14550	36500	5850	87280	15355	7035	68720.00

(Rs. Sixty Eight Thousand Seven Hundred Twenty Cr. Only)

Load Required for:

- Primary Substation: @ 1.0 Acre per substation
- Secondary Substation: Total 11 Acre at different location.



- (iii) Charging Station along Star Highway & National Highway @ 1.0 Acre per Charging Station.
- (iv) Load Growth @ 3 to 4 percentage per year including proposed works of Metro Rail, Vehicle Electric Charging Stations, Industrial, Domestic and Commercial Load.
- (v) Load Growth due to constrictions of Tower International Airport is also included.
- (vi) Primary Substation (400 KV, 200 KV and 132 KV) are also required to be constructed. Cost of Primary S/S is not included in this.

The Service sector share which is expected to be more than 80% in State GDP against current contribution of 55%, will demand more power in future. Expected Jewar Airport development will also lead to related development of service sector and real estate, offering more job opportunities in the region will demand more power. UPPCL had the energy tie-ups up to year 2027. Considering the current tie-ups the deficit in UP is expected to kick in from FY 2030 onwards. It is also expected that Solar Battery Storage will kick-in from FY 2025 onwards as will be the increase in E mobility services.

32. NCT-Delhi also has made proposals for expansion of transmission/ distribution systems with sub-stations, details given in **Appendix-4.5** of the main document of this Plan. NCT Delhi has also made space efficient norms for land requirement for transmission/ distribution sub-stations which could be usefully followed by the other NCR regions in view of the space crunch in the foreseeable future. The norms are given below:

i. NORMS FOR ESTABLISHMENT OF 400KV SUB STATION

- a) Plot Size For Establishment of 400/220/66kv Gas Insulated Metal Enclosed Switchgear (GIS) Sub Station: 200 X 200 sq. mtr.
- b) Transformation Installed Capacity : 4 X 500 MVA (2000MVA)
- c) Reactive Power Management Installed Capacity For Over Voltage : 1 X 125 MVAR
- d) Capacity To Feed Downstream Transmission Network At 220kv Voltage Level : 4 NOS. Sub-station X 500MVA = 2000MVA (considering the reliability (n-1) at both level).

ii. NORMS FOR ESTABLISHMENT OF 220KV SUB STATION

- a) Plot size for establishment of 220/66 /33kv Gas Insulated Switchgear (GIS) substation: 100 x 100 sq. Mtr.
- b) Transformation Installed Capacity : 3 X 160 MVA (480MVA) or 4 X 100 MVA
- c) Reactive Installed Capacity For Over Voltage Management : 2 X 25 MVAR
- d) Capacity To Feed Downstream Sub-transmission Network at 66/11kv Voltage Level For Discom's : 4 Nos. Substation X 95MVA = 380MVA (considering the reliability (n-1) at both level).

Accordingly, suitable plot size for 400kV and 220kV Sub-station may also be kept for new land development schemes.

iii. NORMS FOR ESTABLISHMENT OF 400KV TRANSMISSION LINE

- a) Dedicated right of way (row) i.e, 52 meters for establishment of 400kv overhead (o/h) double/multi-circuit transmission lines is required.
- b) Transmitting capacity :
- c) double circuit (quad bersimis) =2200mw
- d) multi circuit (quad bersimis) =4400 mw

iv. NORMS FOR 220KV TRANSMISSION LINE

- a) Dedicated Right of Way (ROW) i.e, 35 meters for establishment of 220kv overhead (o/h) double/multi-circuit transmission lines is required.



- b) Right of Way (ROW) requirement for establishment of 220kv (u/g) double circuit transmission lines is 2 x 2 (width and depth) meters.
- c) 220KV Underground cables is preferred in place of overhead transmission line because of space constraints/ non-granting of ROW by land owing agencies
- v. **Over Head Transmission Line Is Preferred Over Underground Cable Due to following reasons:**
 - a) Underground cable generate reactive power which leads to over voltage in network and to compensate this issue, reactors are required to be installed which add to the cost of project and extra space (land).
 - b) Higher current carrying capacity of 1200 A per circuit in case of O/h TL with comparison to underground cable having capacity of 700 A per circuit only.
 - c) By using the overhead multi circuit transmission tower in the same corridor, the current carrying capacity can be increased by a factor of 2 .
 - d) Lower project cost (tentatively 1/3 of underground cable).
 - e) Easy Fault Detection and Lower Fault Rectification Time.
 - f) Accordingly, suitable row corridor for 400kv and 220kv overhead transmission lines may also be kept for new land development schemes.



AGRICULTURE SECTOR

Suggested Agriculture Policies which could be detailed out in Sub Regional & lower level Plans

Apart from Recommendations in main Volume, other aspects that could be focussed on in Sub Regional and Lower level plans are as under:

A. Water Efficiency

- 1 Water applied by the irrigation system and not being made available to be taken up by plant roots is wasted and reduces irrigation efficiency. The major causes for reduced irrigation efficiency include storage losses, conveyance losses and field application losses, which needs to be addressed.
- 2 Automation in water management can save irrigation water in vegetables (bottle gourd and potato) in tune of 40% by applying water at appropriate scheduling. It involves real-time monitoring and less human labour, which adds to its benefits.
- 3 For increased water productivity, Drip Irrigation system be preferred over Flood irrigation methods. Drip and sprinkler irrigation system would enhance the efficiency of water usage. The cost of such systems range from Rs. 20,000 to Rs. 1, 00,000. Govt. is providing a subsidy of upto 55%. Benefits of drip irrigation-water saving, less energy cost, reduced labour cost, marginal soils and water, improved crop quality, Higher yields, Higher profits, reduced soil loss. Drip irrigation system be considered for homestead
- 4 Economic analysis of kharif onion-wheat-mungbean cropping system under drip-fertigation technology has shown following benefits as per IARI and should be considered in NCR: :
 - a. Irrigation water requirement for all three crops under drip was estimated as 1015 mm.
 - b. Kharif onion (August to October) - wheat (November to April)-mungbean (April to June) cropping system was found most appropriate from water productivity point of view.
- 5 For Balancing in reservoirs / Farm ponds, use of Solar pumps has been found suitable in irrigation methods, and may be adopted:
 - i) Flood irrigation method -efficiency is 40%-50%. Its suitability to use with solar pumps depends on local conditions.
 - ii) Sprinkle irrigation method -Efficiency is 70% to 80%. It can be used with Solar Pumps.
 - iii) Drip irrigation method – efficiency is 90%. It can be used with Solar Pumps.

B. Farmer Empowerment

- 6 Organic Farming be taken up as it helps in bringing down cost of cultivation. Farmers be encouraged to develop biological insecticides or botanical insecticides, themselves instead of procuring it from the market. Through Param Paragat Krishi Vikas Yojana, 25 clusters in the Alwar district were taken up in 2018-19, and another 150 clusters are taken in 2019-20, where farmers are advised for developing biological/ botanical insecticides.
- 7 Warehouses be developed and declared as market to facilitate city dwellers to buy the produce directly without middlemen, especially along the Expressways.
- 8 FPOs through development of value chain and linking to consumers to play critical role in empowering farmers. In case FPOs appear too small to handle the dairy sector, Milk Producer Companies need to come up and be promoted in an integrated manner. Anand, Gujrat has been promoting the milk producer companies across the country. It is also promoting Bio Gas units for Dung management. In Jakharia village, the entire village is provided with a gas line connected to the bio gas plants. The slurry is also being procured by the



agency, for which the farmers are being paid. Further, the slurry is being converted to fertilizer and is being sold.

- 9 Under the scheme of Soil Health Card, all villages of the Alwar district have been covered with an objective of doubling farmer income by 2022. The scheme, emphasizes on efficient utilization of fertilizers through which farmers got benefitted. Hence, the recommendations of Soil Health Card Scheme may be taken adopted by all Farmers in NCR.
- 10 Concerned departments should encourage farmers to benefit from the National Agriculture Market (eNAM), a pan-India electronic trading portal which networks the existing APMC mandis to create a unified national market for agricultural commodities. Small Farmers Agribusiness Consortium (SFAC) is the lead agency for implementing eNAM under the aegis of Ministry of Agriculture and Farmers' Welfare, Government of India. Farmers's Produce Organisation (FPO) concept need to be followed as FPOs are to play critical role in empowering farmers through development of value chain and linking to consumers.

C. Cropping Pattern

- 11 **Services of agriculture universities** like the ones located in Hisar and Meerut, central institutions of excellence like IARI should be utilized for increasing agricultural activities. Such institutions should also issue seasonal advisories for the NCR districts through Interactive Voice Response System, and call centers with video facilities.
- 12 Every village should have space for horticulture/ vegetables production for the consumption of local people. This space can be based on per person daily vegetable requirements of 231 grams of vegetables or up to 500 grams of fruits and vegetables per day.
- 13 Similarly, certain area should be earmarked based on per person daily milk requirement (250 ml milk per person/day) at local level in each village, space for dairy activities be earmarked in each such Plan. (DDP or ICAP detail)
- 14 Mapping and identification the land and areas for horticulture and vegetables production and dairy activities be done in the SRPs/ DDPs/ Master Plans/ Development Plans/ GPDPs, etc. as applicable.
- 15 Concerned departments in states to assess its available land resources (agriculture land; waste lands; lands with poor quality of soil; saline, barren agricultural & rocky lands, water availability. etc.) and make efforts to optimally utilize such areas through micro planning.

Intensive cultivation leading to maximisation of production from the same landmass be promoted. For example, introduction of hybrid varieties of paddy, specific variety of mustard which produces around 40-42% of oil, hybrid variety of mustard. Productivity led growth should be promoted and area led growth should be discouraged.

Box P-4.2.1: Protected cultivation technology:

- a. Require less land (500- 1000 m² area)
- b. Increases 3 to 4 times crop productivity
- c. Employment opportunities at village level
- d. Improving economic situation (Benefit Cost ratio more than 2)
- e. Maintaining controlled environment
- f. Round the year cultivation

The major crops grown under protected structures include: floriculture crops like rose, gerbera, carnation, anthurium, liliun, orchids, chrysanthemum, etc., and the vegetable crops like tomato, yellow and red bell peppers (from the capsicum family), cucumber, leafy and exotic vegetables, etc.

- 16 With protected cultivation, unseasoned crops/ vegetables and fruits for the population of this region may be produced. This shall help the region to be self-sustainable which would further lead to a decrease in carbon footprint because it would further lead to a decrease in transportation activities required to carry vegetables or fruits from other areas. Currently, Sonipat, Panipat and Karnal area have one of the



largest density of protected cultivation ⁴in the country supported through central Govt. programs. Comparison between open cultivation and protected cultivation indicates that production in protected cultivation is much higher than the open cultivation. E.g. It shows 336 % increase in cultivation of capsicum.

- 17 Adopt Plug-tray nursery raising technology is suitable for Melons, gourds and squashes for their off season cultivation in Northern India. This kind of technology is good option for the agri. entrepreneur by the progressive farmers or unemployed educated youths in major vegetable growing parts of the country.)
 - a. Production cost per seedling: Rs. 0.6 to 0.7 without seed cost
 - b. 1.5 to 2.0 lakhs seedling in 500 m² area under semi climate-controlled poly house (10 to 16 lakhs in year, 6-8 batch per year)
 - c. Benefits: Selling price Rs. 1.5 to 2.0 / seedlings, Income: 4-8 lakhs per year, Employment generation: 2-3 persons per structure
 - d. Developing seedlings 15 days earlier with minimal mortality also helps in earning extra benefit of Rs 37,500-50,000 per ha.
- 18 Adopt High Quality vegetables production technology, as applicable:
 - a. Cucumber :80-100 tons/acres; 3-4 crops cycle; BC ratio 3.8
 - b. Tomato :60-70 tons/acre, 10-11 months crop duration; BC ratio 2.5
 - c. Capsicum :30-40 tons/acre; 9-10 months crop duration; BC ratio 3
- 19 Crop diversification option from low value crops to flowers (IARI)⁵ :
 - a. Rose :4-5 lakhs/ha; perennial crops 5-7 years; profit of Rs. 2.5 to 3.0 lakhs per year from 1000 m² area with BC ratio of 3.0
 - b. Chrysanthemum :5-7 lakhs/ha; crop duration 3-4 months; BC ratio of 4.0
 - c. Gerbera: 10-12 lakhs/ha; perennial crop 4-5 years; BC ratio of 3.5
 - d. Carnation: 6-9 lakhs per ha; perennial crops 3-4 years; BC ratio of 2.5)

D. Planning norms

- 20 States may devise a strategy to protect and support agricultural production and mineral resources by preventing inappropriately dispersed urban activities in rural areas. Reference of initiatives taken in Cuba and Sikkim regarding urban agriculture and agriculture production promotion, could be considered.
- 21 Haryana has identified an 25 acre area for Dairy Cluster. The idea is to shift the dairies from the city core. Such initiative may be taken by other states, preferably in peri urban areas. The value of land varies according to its use. residential/ commercial land value is higher than agricultural land. Hence, the areas where the dairies are to be shifted, zoning should be done such that they are considered under agriculture land use. Discounted land prices to dairy farmers may also be planned to incentivize them.

E. Food Processing & Logistics

- 22 Avoid unnecessary planning for Cold chain. If a fruit/vegetable is harvested and its selling cycle is within 48 hours, faster movement of the goods so that it reaches to the consumers should be focused upon.

F. Food Safety and Produce Certifications

- 23 Regulations of the FSSAI should be followed and enforced strictly. Possibilities of having globally benchmarked food standards and practices should be explored and food testing with standardized testing methods and protocols should be carried out.

⁴ National Centre for Cold-chain Development (NCCD)

⁵ Water Technology Centre, Indian Agricultural Research Institute, New Delhi



- 24 Possibility of having consumer testing kits for preliminary checking of adulteration in food, milk, etc., be explored by the concerned departments.
- G. Agri-Marketing**
- 25 Significant operational changes shall be required at working level to encourage use of processed waste water for irrigation, which shall involve Hand holding support by academicians & experts.
- 26 Use of compost created from solid waste management and other waste management sources in the village/ block/ tehsil/ district, etc. should be ensured at local level.
- H. Livestock & Fodder**
- 27 Four pillars in livestock sector to be focussed upon:
- a. Disease Control – vaccination program to be done. Tagging of animals to be done, this unique identity will be there throughout the lifetime. Through this, presently govt. has initiated the task on traceability of products.
 - b. Breed Improvement
 - c. Nutrition and cost of fodder- Awareness in ration balancing.
 - d. Processing and marketing of products.
- 28 Initiatives of Haryana like ‘DudhkiChakki’ be replicated. It is a project ongoing, where a milk processing van with experts goes to the village and trains youth to process milk and prepare 8 milk products like khoya, paneer etc. This is initially to motivate the youths. Then the youths are being trained in the training centers. The idea is that the milk produced in the region, is being utilized in the same region itself. This may be done to reduce the adulteration aspect.
- 29 Often, milch cattle owners do not have arable land where they could use the cow-dung. Hence, cow dung disposal units, usage of cow dung in bio gas plants, should be thought off. In Punjab, a machine has been developed which compresses the cow dung which is mixed with a little amount of straw. This forms a shape of a wooden structure which can be used for burning instead of firewood. Machine costs around Rs. 52,000 om 2019 prices.
- I. Research and Development, Technology & Skill Up gradation**
- 30 IIT Delhi has come up with technologies where wastelands could be developed using locally available micro-organisms in the soil. Some major steps for the same are:
- i) Isolation and identification of the desired micro-organism from the local soil.
 - ii) Multiplication of the micro-organism isolated & identified to develop a culture for same.
 - iii) Combining the culture with a carrier to produce a bulk product easy for transportation and application at a decentralized level.
 - iv) Development of nurseries based on the above technologies and training of farmers.
 - v) Transportation and application of the saplings in the farmer’s field.
- 31 State Agricultural Departments need to work in close coordination with Agricultural universities and research institutions in the sector. Joint efforts should be not only to increase farmer incomes in NCR but also provide agricultures produce/products at reasonable prices to end consumer. NCR states may explore possibility of having Center of Excellences in the region for the purpose.
- 32 NCR has Strong possibilities to enhance the production & availability of green fodder through various technological interventions from the existing land under fodder cultivation & pastures, which need to be exploited. Hydroponic fodder unit is available with National Institute of Animal Nutrition, the design is available with the institute. Just for Rs. 30,000, it gives 30 kg of fodder every day with just 35 kg of water.



It feeds about 3 cows a day. Where land is scarce fodder can be grown, at home itself through Hydroponics. Soft loans of NABARD may be directed in this direction also. This unit is also available in solar version. There is another unit which produces 100 kg per day of fodder, and it costs Rs. 90,000. Hence, NCR states may explore possibilities to introduce Hydroponics, as well.

- 33 Courses on dairy farmer and entrepreneur, veterinary health assistant, animal health worker, fish farmer related to animal husbandry and fishery sector may be imparted to people in this region. PashuGyan Ganga program, as initiate in Haryana to educate children about animals, could be taken up by other states as well. In addition, promotion of Pashu Kishan Credit Card could be undertaken.
- 34 Biogas slurry linked micro irrigation system, as already being applied for wheat in certain areas of District Bulandsaher, could also be adopted based on the following benefits:
 - a. For 12 ha of irrigated land having wheat, paddy, soybean, mung, gram & pulses
 - b. For Horticultural crops like guava, mausambi, jamun, jackfruit, mango,
 - c. 15 animals and selling milk and ghee.
 - d. Maximum seed production in pulses like pea (i.e., 43 q/ha)
 - e. Gobar gas slurry spray system with sprinkler.
 - f. Motivates other farmers to opt organic farming.
- 35 Central Institute of Fishery Research has come up with a model which is costs about Rs. 90 lakh, where 10 dead cows can be disposed off every day by feeding it to those fishes which eat the dead animals.
- 36 Adoption of Artificial lights applications could be attempted for floriculture. Flower induction along with desired stem length (>65cm) can be achieved in 39-42 days through PAR @110-120 $\mu\text{mol m}^{-2}\text{sec}^{-1}$ from a combined 80% red 20% blue Ledsin Chrysanthemum.
- 37 Strategies for R&D on Sugarcane⁶
 - a. Developing high sugar, high biomass, disease resistant and pest tolerant, good ratooning, input responsive sugarcane varieties.
 - b. Precision agriculture with improved planting methods, stress management modules and integrated nutrient supply system in plant and ratoon crops.
 - c. Carbon sequestration to balance nutrient requirement.
 - d. Quality seed production with timely seed replacement.
 - e. Developing integrated pest and disease management modules, specifically for red rot disease and sugarcane borers.
 - f. Increasing physiological efficiency of sugarcane varieties for biomass and sugar.
 - g. Design and development of machinery sugarcane cultivation, esp. for small farmers.
 - h. Minimizing post-harvest sucrose losses.
 - i. Quantifying and mitigating the effect of climate on yield and quality of sugarcane.
 - j. Harnessing the power of emerging and frontier areas of science like biotechnology, bioinformatics, product diversification, etc., in sugarcane.
 - k. Developing sugar beet agro-technologies.
 - l. Outreach Programmes viz., training, consultancy and advisory services to farmers, industries and other stakeholders.

⁶ Crop Protection Division, ICAR-Indian Institute of Sugarcane Research, Lucknow



J. Pisciculture

- 38 A Re-Circulatory Aqua Culture System is available at 2019 cost of Rs. 50 lakhs. In 1000 gauge area, in every 8 months, Rs. 18 lakhs of fish can be cultivated. Re-Circulatory Aqua Culture System, Bio Flock and Back Yard RAS will play an important role in the near future and may be developed in the NCR area.
- 39 Efforts may be made such that water may be taken from the canal and stored in a small area (pond) which can be used for fisheries, and then later on through drip irrigation, the nearby areas may be cultivated through it. Azola fodder with 28-35% protein may be cultivated on the same pond that has been developed. Azola is fodder for cow, buffalo, pigs, hen etc. and can be harvested after every 21 days. Efforts should be made to communicate such initiatives and encourage the farmers for adoption.

K. Strategies to reduce food wastage

- 40 **To address the issue of food wastage, while additional /required storage spaces/facilities are to be in place at macro level, certain important steps can be taken at micro level as well, which may include:**
- a. Large grocery stores to donate all unused but still edible food to charitable organisations. All the large market chains, malls and stores may plan in advance by concluding formal agreements with various charities regarding the deemed donation and use of unused, but safe-to-eat food.
 - b. Food that is not packaged properly or is damaged or is past the expiry date but is still safe to consume must be donated.
 - c. Specific penalties could be prescribed for stores that fail to follow the government directives and deliberately spoil unsold food, thereby pre-empting their consumption by the needy
 - d. To eliminate commercial food waste steps of banning retailers from wasting edible food could be considered as in France. All edible food be donated to food banks or animal feeds.
 - e. Administrations need to put in place a strong mechanism against intentional or incidental food wastage.
- 41 Roof top vegetable production/ Terrace Gardening or kitchen gardening or Vertical farming should be focused upon. Usage of Urban Space like the terraces, building colonies, for producing the vegetables required would further lead to enough quantity of vegetables for exporting. Getting soil for terrace cultivation has been an issue in urban areas. Hence, alternate media for crop growth like coco peat may be looked at.

L. Other Aspects

- 42 Agri data system be improved and this may include data related to Sowing, Central database, output estimates, marketing facilities, storage and warehouse facilities, etc.



Annexure P-4.4

EDUCATION AND SKILLING

Suggested smart and digital infrastructure policies which could be elaborated in Sub-regional Plans, Master / Development Plans and other lower level Plans

1. Technology⁷**1.1 Technology for Students**

- a) Use of Internet of Things (IoT) to enhance quick response service for student safety
- b) Student safety in schools and transport vehicles leading use case for IoT in student safety
- c) Convert all classes into the Smart class

1.2 Higher education

- a) Technology could provide high quality courses to democratize higher education through digital platforms such as DIKSHA

1.3 Skilling

- a) **Open and Distance Learning (ODL)** of courses in higher education has the potential to significantly increase skilled human resource in workforce
- b) **Platforms such as DIKSHA** could enable life long learning for a vast number of students in higher education

1.4 Digital Integration of schools

- (i) schools through internet and IoT
- (ii) Making teaching data driven through enabling sharing of learning data and digital resources across schools
- (iii) Globally, EdTech is being used to tackle multiple challenges and with different cases:
 - a) In-Classroom case Challenges include Large backlog in learning leading to huge diversity in learning levels within the classroom leading to Multi-grade Teaching and Multi-level (MGML)Teaching
 - Role of Edtech:Personalized Adaptive Learning (PAL) solutions identify student misconceptions and can remediate at the right level
 - b) For Teachers case Challenge is Teacher incentives in public-school system not aligned to outcomes; 20% of teachers are absent from classrooms; 15% of teaching positions vacant
 - Role of Edtech-Technology driven need-based teacher training and support
 - Tech-enabled delivery of curriculum-aligned teaching content vis DCR, VCR
 - c) At Home the Challenge is Low parental education levels & awareness of tech for education in low income communities and First-generation learners do not have access to quality school education
 - Role of Edtech-Students can access free high-quality content after school in multiple languages using smartphones connected to the internet
 - Many of these solutions are self-learning, requiring minimal (if any) parental support
 - d) Via Data the Challenge is Limited knowledge on teacher knowledge gaps and student learning levels and Current curriculum design not data-driven based on student learning pathways
 - Role of Edtech-Data-driven interventions to solve for critical challenges and gaps for students and teachers

⁷ Training & Skill Education Div., Central Board Secondary Education



- Science of Learning Library (SLL) is an open source encyclopaedia of assessments, learning data, gaps etc.

2. Infrastructure

- 1.1 The gap between Government and Private Institution with regard to infrastructure, fees, quality of teaching etc. need to be minimized.
- 1.2 Foreign language institutions should be established in the region.

3. Evaluation & Monitoring

- 1.1 Ensure sufficient supply of quality education and even childcare facilities to meet demand and offer educational choice. Districts/Departments should:
 - a) Identify and address local needs and any shortages in supply, both locally and sub-regionally, including cross-boundary issues
 - b) identify sites for future provision through the Local Plan process, particularly in areas with significant planned growth and/or need

4. Design and Planning

- 1.1 Development proposals for education and childcare facilities should:
 - a) locate facilities in areas of identified need
 - b) locate facilities in accessible locations, with good public transport accessibility and access by walking and cycling
 - c) locate entrances and playgrounds away from busy roads, with traffic calming at entrances
 - d) link to existing footpath and cycle networks to create healthy routes to schools, and other education and childcare facilities, to encourage walking and cycling
 - e) maximise the extended or multiple use of educational facilities for community or recreational use, through appropriate design measures
 - f) ensure that new developments are accessible and inclusive for a range of users, including disabled people, by adopting an inclusive design approach
- 1.2 Social and public services, including hospitals, education and training centres, be developed in the less developed areas of NCR.

5. Skill Development and Trainings

- 1.1 Along with basic education, Skill trainings provide the right framework for best use of people to enhance productivity.
- 1.2 While MSDE is working on availability of resources, Gram Panchayats should prepare Gram Panchayat Development Plan which be integrated in the District Skill Development Plan.
- 1.3 For Convergence and decentralization, possibilities be explored at district level for dovetailing various skill trainings. For decentralisation - District Skill Committee to prepare District Skill Development Plan. The functionaries of districts should be aware fully about all aspects. Migration is important factor to be included and District Skill Committee may set up a Sub-committee for this aspect.
- 1.4 State departments may encourage the prospective people to benefit from various apps (applications) prepared by different Skill Councils, and enable them to stay updated about the sectors and related required skills.
- 1.5 Domestic work sector presents vulnerability for Migrants, women (which are under the risks of being trafficked or physical and sexual exploitation) as nature of work is limited to the private space of household. Hence



the domestic work sector in India which is currently operating in absence of a legal framework protecting the welfare and rights of the workers, needs a Legal Framework in this regard. Frequent and regular State-wise Awareness Events and Workshops should be organised by State missions/ departments in coordination with DWSSC to sensitize the stakeholders on the need for skill development of domestic workers and the opportunities open for them to get dignity of their services to the society.

- 1.6 NCR state departments and concerned skill mission to take benefit of the SAAMARTHA scheme which envisaged re-skilling of 1 Million workforce in the rubber sector over the next 5 Year as approved by Ministry for Skill development & Entrepreneurship (MSDE). In the first phase SSC has been allocated 32000 numbers to be trained under RPL.

6. Other Macro Level recommendations

1.1 Department of Higher Education to formulate policies for the following:

- a) Consider hiring of retired distinguished teachers/researchers, without any age limit as mentors in Universities (shall help young faculty being groomed as currently superannuated faculty are not eligible to submit research proposals).
- b) Initiate employment track for university staff including faculty to help in identification of talents right from the early stages of educational ladder, who are visualizing their career and livelihood through teaching and research. ECR (Early Career Researchers) program at UG level in all the disciplines.
- c) Ratio of academician vs practitioner be well defined in advance, especially in professional programmes
- d) Clarity be provided regarding permissions to practitioners regarding teaching & research
- 1.2 Strengthening the existing institutions of learning in the Sub-region. Universities should focus on sector specialists.
- 1.3 Creation of an environment that students from abroad are attracted in the Sub-regions of NCR and get trained here and help in the betterment of world.
- 1.4 All classrooms in the existing universities and colleges should be smart and equipped with latest pedagogical tools.



Annexure-P-5.1

CHAPTER-5. TRANSPORT AND MOBILITY

Suggested Policies - Transport and Mobility

A. Road Network Proposals

1. All missing links needs to be taken up on priority for competition both at intra city, inter- city as well as intra and inter region levels. The sub-regional plans should prepare a comprehensive list of missing links of National and State highways, Major district roads and major bypasses along with major rail links in the sub-region with maps.
2. Widening and strengthening of all NH and SH in NCR should be undertaken in a phased manner, as applicable.
3. All rural settlements across NCR should relate to all-weather roads and norms may be relaxed to enable this under PMGSY.
4. NHAI and state PWDs or related departments, may consider having dedicated freight lanes on respective NH /expressways/ SHs etc. to optimise freight productivity in the region.
5. Hapur-Kothore- Mawana road could be upgraded to NH and can act as outer ring for Meerut.
6. Possibilities should be explored for additional road network supplementing the NH-1(erstwhile) in the North-Western side of Delhi NCR.
7. Expedite the completion of other important projects in NCR already identified by NHAI for completion by 2025 (refer list of 15 such projects given in the key projects list).
8. To ease congestion, Delhi government to invest in widening of roads stretches like roads in Mahipalpur area, road stretch connecting Dhaura Kuan to Gurgaon, Rao Tula Ram Marg (single lane roads), etc.

B. Bicycles and Pedestrian Facilities

9. MoHUA is expected to purchase 20,000 buses for these 5 lakhs plus cities & capital cities. MoHUA support to these cities will be provided either through state budget, PPPs mode and per km basis. NCR States should make a plan to mobilise resources from this budget and prepare projects in their SRPs.

C. Rail Network Proposals

10. Explore possibilities of construction of the proposed railway lines/ introduction of new rail networks/ conduct feasibility studies on new lines and line expansion, centering on those proposed by the Indian Railways.
11. Possibilities of providing additional capacity at rail freight bottlenecks, rail yards, and rail lines shared with passenger rail operations, should be explored.
12. Utilisation of spare and off-peak capacities for cargo movement can be explored gainfully in NCR portions of Railways.
13. Railways right of way (ROW) could be critical factor for future and should be planned in advance. Better and optimal usage of huge railway land in NCR along with possible sharing of right of ways of railways, be looked into, after making it encumbrance/ encroachment free.
14. NCRTC should explore possibilities to increase average speed of RRTS to about 250-300 kmph⁸ may be with dedicated tracks and inter- stoppage station distance of at least 50-60 kms for high-speed options.
15. States may make assessment and prepare plans for same, and indicate Metro Lite/ Metro Neo corridors in respective SRPs. Such cities should undertake feasibility studies and make proposals for accessing MoHUA funds, so that the same can be planned as part of SRPs.

⁸ Currently, Shanghai Maglev has the highest maximum operational speed of 430km/h and average speed of 251kmph



D. Air connectivity Proposals

16. The funnel regulations with respect to having airports / airstrips and identified locations / already existing unserved /underserved / non- functional airstrips, may be take care of, in advance and land reserved/allocated accordingly, to avoid future development related issues, in future.

E. Intra urban public transport system

17. NCR States should develop extensive fleet of buses along with electric vehicles and supporting infrastructure like depots, workshops, electric charging stations etc., at city transportation level as well as inter-city level to encourage low carbon mobility.
18. Possibilities of having high speed capacity bus systems, needs to be explored for all NCR regional centres

F. Multi-Modal Integration

19. Initiatives need to be taken to integrate existing and new modes into an accessible multimodal network. Various new digital shared mobility services, such as bike-sharing, car-sharing, courier networking services, ridesharing, and transport service providers (including micro-transit, ride-sourcing, and ride-splitting), along with traditional taxi services can offer huge potential in providing new options in getting around the urban areas in the region.
20. Need to introduce flexible fleets of on-demand, shared, electric and eventually, self-driving vehicles (autonomous vehicles) that connect to transit within a mobility hub in the region. Further new mobility hubs may be introduced, with a range of travel options, to address first- and last-mile connectivity challenges and to deliver a more seamless travel experience.

G. Warehouse and Logistics facilities

21. District/ City Administration should understand transport patterns and needs and suitably plan for city freight logistics allowing more hours for movement of freight vehicles.
22. To have good transportation facilities radial network with reticular road and rail networks shall have to be planned in NCR, as illustrated conceptually in figures below:

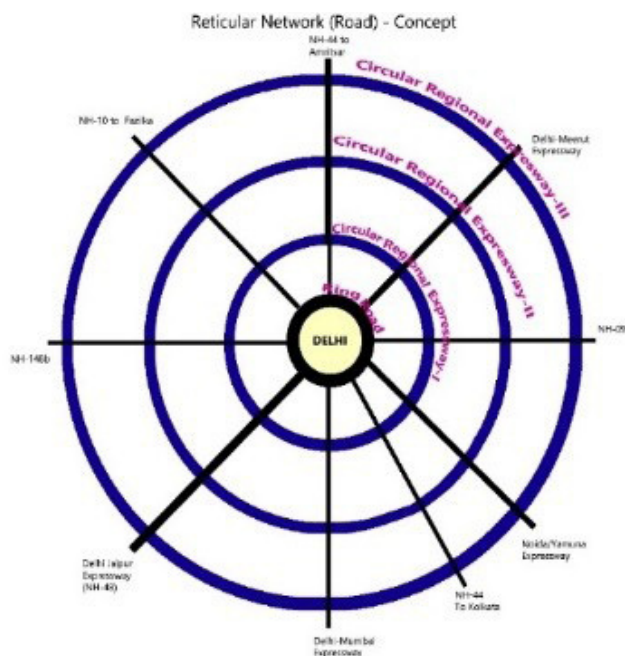


Figure P-5.1.1: Reticular Network (Road)-Concept

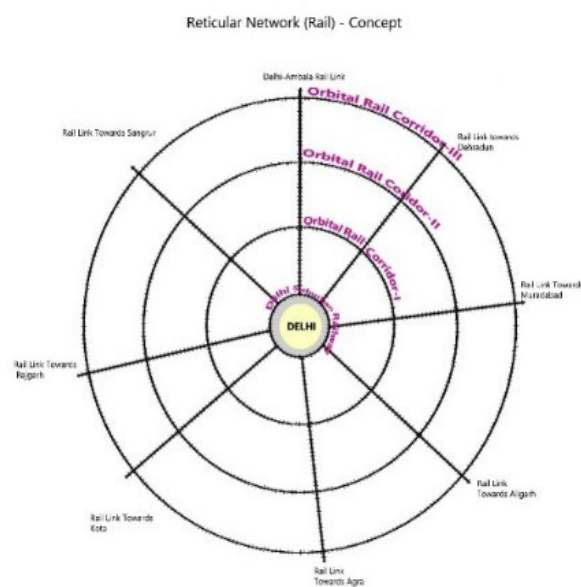


Figure P-5.1.2: Reticular Network (Rail) - Concept



ICT and Smart Mobility

23. Government must support the development of local and regional transportation system management strategies based on ITS such as the provision of information to operators of goods and service vehicles for efficient travel decisions, management of traffic flow using transit priority measures, coordinated traffic signalization, and lane management.

H. Institutional arrangement

24. Transport Policy and Planning Group (TPPG) should be an “Empowered Group” with ACS level officer as its head and should take into consideration the policies for overall spatial planning for the region with the objectives:
 - a) to spell out goals and formulate policy guidelines to facilitate preparation of a Strategic Transport Plan (STP) for the sub-region and a multi-modal plan for linkages with NCR
 - b) to coordinate activities of various groups/agencies at the plan formulation stage,
 - c) to regulate allocation of funds to different agencies for coordinated development
 - d) to ensure provision of land with focus on identification, reservation, and protection for development of transport related projects.
 - e) to conduct Safety Audit of all transport plans, designs and operations.
25. State departments should collaborate engagement with the safety and security regulators for promoting safe air traffic in NCR with initial focus on Metro Centres and its satellite/ nearby towns.

I. Transit Oriented Development (TOD)

26. Efforts be made to achieve transformation from the present inefficient land use and unsustainable land markets to synchronizing public and private investment around transit stations, nodes and transformation areas in future in the region.
27. Major projects need to be identified with justification of benefits and land be reserved along the transit corridors for future development up to 2041. Identifying and preserving land for future port and airport, intermodal and rail infrastructure at macro level and even the land required for transit uses, like truck/ bus layovers.

Suggested Broad Policies for Multi Model Transport which could be elaborated in Sub-Regional Plans and Master/ Development Plans

1. For Intra NCR connectivity the potential demand within shorter leads need to explore possibilities of making Helicopters as a popular option. Option of considering the versatility, Heli operations can be viable for i) Heli Emergency Medical Services, ii) Airborne policing iii) Tourism, iv) Higher disposable income customer,
2. Improved Air connectivity through Helipads for purpose of normal commute/ air ambulance / policing & security purposes/ Disaster mitigation etc. also enhancing prospects of tourism.
3. **Multi-Modal Integration** - Basic Design Principles of Multi Modal Integration (MMI) to:
 - a. Ensure seamless integration of Metro stations with all public transport within 300m radius distance from the metro station.
 - b. create adequate pick up and drop off facilities
 - c. create pedestrian pathway/ plaza, cycle track for safe and easy movement of people
 - d. Improve walkability around metro station.
 - e. Follow UTTIPEC Street Design Guidelines.
4. Interventions required from MMI to be considered at the micro level may include Road junction improvement & traffic calming measures; Creation of Pedestrian Zones with Universal Access; Drop off zones & road crossing facilities; Improvement of lighting; Provision of all public facilities; Creation of Cycle Track and



dedicated bays for IPT; Provision of Signage and Railings, have Bus stops within 150m of metro station entrance.

5. Traffic management at local level

- a. Benefits of Staggered Working Hours could include 10-15% reduction in peak hour traffic, reduction in commuting time, improvement in workers' efficiency, better health and well-being of community, possible increasing participation of women in work force, so different starting and closing times for different establishments could be explored/considered. Flexi work hours in offices (as in UK, all employees have the legal right to request flexible working hours; more than 1/3rd of employees in US work on flexi- schedule; Flexible Work Arrangements (FWA), Singapore- the employers offering flexi work hours are entitled to receive financial incentives). Flexibility in working schedule is attributed to improvement in well-being of employees, their productivity, level of satisfaction, attracting and retaining the talent.
 - b. Other ways may include Work from home- once or more in a week as in Singapore and Hong Kong ; Tele-meeting/Video conferencing ; Compressed Work hours- 10-11 hrs for 4 days a week; Shared Mobility etc.
6. **Transport System for cargo:** Develop an integrated digital supply chain or e-cargo gateway based on the National Air Cargo Community System (NACCS) platform⁹. The modular development may include the digital business enablers as plug-ins (as suggested by NITI Aayog) such as
- a) e-contracting/ booking of cargo – with access to financial payment gateways.
 - b) e-transportation multimodality (road-air first/ last mile connectivity).
 - c) e-compliances
 - d) Cargo Sewa – a grievance redressal module linked to Air Sewa.
7. Suggested Amenities and Facilities for Bus Terminals are shown in **Table P-5.1.1:**

Table P-5.1.1: Suggested Amenities and Facilities for Bus Terminals

S. No.	Amenities / Facilities	S. No.	Amenities / Facilities
1.	Drinking water & Hand Pumps	2	Lighting & passenger sheds & station
3.	Fans in passenger sheds	4.	Benches & chairs
5.	Display of time table and fare list	6.	Toilets and urinals
7.	Suggestions/complaint box	8.	Booking and enquiry counter
9.	Canteen/book stalls/general merchant shops	10.	Boarding platform
11.	Stalls	12.	PCO
13.	Passenger lounge	14.	Mini tube well and moulded tank
15.	Idle parking	16.	Public address systems
17.	Water cooler	18.	In-out enquiry
19.	Generator	20.	Administrative office
21.	Driver/ conductors rest room	22.	Private car, scooter rickshaw parking
23.	Television	24.	AC canteen
25.	AC waiting room	26.	Dormitory
27.	Computerized arrival/ departure	28.	Computerized booking/reservation
29.	Tube well & RCC overhead tank	30.	Cloak room
31.	Tourist information centre	32.	Washing machine
33.	Security room	34.	Passenger Information system
35.	Real Time Information System		

Source: Functional Plan on Transport for NCR-2032

⁹ <https://www.civilaviation.gov.in/sites/default/files/Final%20ACS%20Report-compressed.pdf>



Annexure-P-6.1

CHAPTER-6. TOURISM & HERITAGE

Tourist Destination which may be developed as ‘Smart Tourist Destination Sites’

1. **Tourist Destination which may be developed as ‘Smart Tourist Destination Sites’ are at Table P-6.1.1**

Table P-6.1.1: Major Tourist Destinations in NCR

(i) **Most Visited Tourist Destinations in NCT Delhi, 2019**

Major Tourist Destinations		
1. Qutub Minar	2. Indira Gandhi Smriti	3. Kotla Feroz Shah
4. Red Fort	5. Lodhi Tomb	6. Tughlaqabad Fort
7. Delhi Zoo	8. Mughal Garden	9. Rahim- Khan- I-Khana
10. Pragati Maidan	11. Gandhi Smriti	12. Sultan Ghari's Tomb
13. Dilli Haat – INA	14. Asola Wild Life Sanctuary	15. Nehru Museum
16. Jama Masjid	17. Gurudwara Rakab Ganj	18. Agrasen ki Baoli
19. Akshardham Mandir	20. National Museum of Natural History	21. Craft Museum
22. The Bahai Temple (Lotus Temple)	23. Nehru Planetarium	24. Yog Maya Mandir
25. Hazrat Nizam-ud-din Shrine	26. Shankar's International Dolls Museum	27. Buddha Memorial
28. National Science Centre Museum	29. Humayun's Tomb	30. Ahimsa Sthal
31. Purana Qila	32. Chhatarpur Temple	33. Air Force Museum
34. National Rail Museum	35. India Gate	36. Safdarjung Tomb
37. Gurudwara Bangla Shahib	38. The Garden of Five Senses	39. Sanskriti Museum
40. Gurudwara Sis Ganj	41. National Museum	42. Dilli Haat - Pitampura
43. Raj Ghat	44. National Gallery of Modern Art	45. Palika Bazaar
46. ISKCON Temple	47. Laxmi Narain Temple (Birla Mandir)	48. Jantar Mantar

(ii) **Tourist destinations of Haryana in NCR**

Major Tourist Destinations		
District Bhiwani	District Mahendergarh	District Rewari
1. Ancient Site of Naurangabad	1. Birbal Ka Chhatta	1. Baag Wala Talab
2. Fort of Loharu	2. Chor Gumbad	2. Bada Talab
3. Palace of Dadri	3. Fortress of Islampur	3. Bhagwati Bhakti Ashram
4. Prithviraj Ki Kutcheri	4. Jal Mahal	4. Fort of Bawal
5. Star Monument, Bhiwani	5. .Mirza Alijan's Takhat & Baoli	5. The Ghanteshwar Mandir
6. Tombs of Loharu	6. Pir Turkman Tomb Complex	6. The Red Mosque
District Faridabad	7. Shah Quli Khan's Tomb	7. Tombs of Turkiawas
1. Anandpur Bandh (Dam)	8. .Shobha Sarowar	District Rohtak
2. Aravalli Golf Course	9. Tomb of Ibrahim Khan Suri	1. Ancient Site of Farmana
3. Gymkhana Club	10. Tomb of Shah Nizam	2. Ancient Site of Khokhrakot
4. Mughal Bridge	11. Tomb of Shah Wilayat	3. Asthal Bohar
5. Nahar Singh Cricket Stadium	12. Tripolia Gateway	4. Meham
6. Nahar Singh Palace	District Palwal	5. Shahjahan ki Baoli
7. Rajhans Convention Centre	1. Baba Udasnath Mandir Mandir	6. Tilyar Convention Centre
8. Rose Garden	2. Dauji Mandir	District Karnal
9. Surajkund	3. Panchvati Temple	1. Cantonment Church Tower
10. Surajkund (a masonry tank)	4. Pandav Van	2. Dargah Nuri



Major Tourist Destinations		
District Gurugram	5. Raja Nahar Singh Fort, Ballabgarh	3. European Soldiers Grave
1. Aranya Greens Farm	6. Roshan Chirag Tomb	4. Gateway of Old Mughal Sarai
2. Ariisse Farm	7. Sati ka Talab	5. Kalander Shah Tomb
3. Badshahpur Fort and Baoli	8. Sayeed Sharif ki dargah	6. Karna Tank
4. Baoli Ghaus Ali Shah	District Panipat	7. Kushan Stupa
5. Begum Samru Palace	1. Bab-i-Faiz Gate	8. Miran Sahib Tomb
6. Cawn Sarai	2. Devi Temple	9. Naraina
7. DLF Golf and Country Club	3. Hemus Samadhi Sthal	10. Old Badshahi Bridge
8. Golden Greens Golf & Resorts	4. Ibrahim Lodhi's Tomb	11. Old Fort
9. Golden Turtle Farm Village	5. Kabuli Bagh Mosque, Panipat	12. Sita Mai Temple
10. ITC Classic Golf Resort	6. Obelisk Commemorated to 3 rd Panipat Battle	13. Taraori Sarai
11. John Hall	7. Panipat Museum	District Sonapat
12. Karma Lakelands Golf Course	8. Salar Gunj Gate	1. Ancient Pandav Place
13. Kingdom of Dreams	9. The Kala Amb Park	2. Ancient temple of Guru Gorakhnath
14. Manesar Golf Course	10. The Original Babri Masjid	3. Baba Dham
15. Mosque & Sarai of Ala Vardi Khan	11. Tomb of Bu-Ali-Shah Qalandar	4. Baba Meer Mukand Sainipura
16. Sheetala Devi Temple	District Jind	5. Buddhist site of worship
17. Shish Mahal	1. Ancient Fort at Safidon	6. Dada Shambhunath, village Nahri
18. Sultanpur Bird Sanctuary	2. Bodh Stupa	7. Historical memorial site in village Badkhalsa
19. Tarudhan Golf Course	3. Dhamtan Sahib	8. School of Sports, Rai
20. TERI Golf Course	4. Fort of Jind	9. Tirath Satkumbha temple
21. The Golf Retreat Farm	5. Hansdehar	10. Tomb of Khwaja Khizr
District Jhajjar	6. Narwana	
22. Bua Wala Talab	7. Pindara	
23. Group of Tombs and Mosques	8. Qilla Jafargarh	
24. Gurukul, Jhajjar Museum	9. Ramrai	
25. Rattan Garh Farm	10. Rani Talab	
26. Ancient Temple of Pandvas Bhimeshwari Goddess		

(iii) **Tourist destinations of Uttar Pradesh in the NCR, 2019**

Major Tourist Destinations		
District Baghpat	District Meerut	District Ghaziabad
1. Laakshagrah :- (Barnava)	1. Shahpeer Dargah	1. Dudeheshwar Nath Mandir
2. Pura Mahadev Temple :- (Baloni)	2. Vilveshvarnath Mahadev Temple	2. Mahamaya Temple
3. Badagaon Jain Temple (Near Khekhra), Chandra-prabhu Digamber Jain Atishya Kshetra, Barnawa; Chhaprauli Jain Temple, Baraut	3. Pracheen Balaji Mandir	3. Swarn Jayanti park
4. Valmiki Ashram (Balani)	4. Haji Kabristaan	District Hapur
District Bulandshahr	5. British cemetery	1. Nacha Kuan
1. Balai Kot or Upper Court	6. Dargah of Hazrat Bale Miya	2. Ganga Temple
2. Exhibition site	7. St. John's Church	3. Brijghat
3. Moti Bagh Palace	8. Jali kothi	District Muzaffarnagar
4. Ahmadgarh Fort near Sikarpur (Ruins)	9. Ghantaghar	1. Shukratal town - A 72 ft high idol of Hanumanji
5. Narora Ganga Barrage	10. Mustafa Palace	2. Akshay vat Shukthirih
6. Belon-Wali Mata Mandir	11. Shaheed Smarak and Freedom Struggle Museum	3. Government Educational museum



Major Tourist Destinations		
7. Raj Ghat	12. Historical Jail	4. Ganeshdham Shuktirth
8. Anoopshahar Ganga Ghats (Known as Mini -kashi)	13. Augharhnath Mandir	5. Vehelna Shuktirth
9. Ahar (Ganga Ghat)	14. Suraj Kund	6. Sambhalheda Panchmukhi Shivling
10. Aankeshwar Mahadev Temple	15. Chandi Devi Temple	7. Shuktirth Ganges Holy Bath
11. Avantika Devi Temple	16. Jama Masjid	8. Nakshatra vatika, Shukartal
12. Unchagaon Fort	17. Ghandhari Talab	9. Shukateerth Shukartal
13. Mud Fort and Rao Raj Vilas	18. Gopeswar Temple	District Shamli
District G B Nagar	19. Sharang Rishi Ashram	1. Mosque and Tomb of Shah Abdul Razak and his four sons
1. Surajpur Bird Sanctuary	20. Bahsuma	
2. Iskon Temple	21. Draupdeswar Mahadev Temple	
3. Botanical Garden	22. Draupdi Ghaat	
4. City Park, Greater Noida	23. Archaeological sites of Hastinapur	
5. Stellar Children's Museum	24. Jamboo Dweep & Jain Temples	
6. Okhla Bird Sanctuary	25. Hastinapur Wild Life Sanctuary	
7. Dankaur (Dronacharya Village)	26. Begum Place & Begum Samru Church	
8. Bisrakh	27. Sardhana Church	
9. Buddha International Circuit		
10. India Expo Mart & expo Center		
11. Murseedpur Reserved Forest		
12. Gulistanpur Reserved Forest		
13. Surajpur Jheel:Migratory Birds Saras.		

(iv) **Tourist destinations of Rajasthan in NCR**

Major Tourist Destinations		
District Alwar	11. Viratnagar	District Bharatpur
1. Alwar	12. Bhartrihari	1. Keoladeo Ghana National Park,
2. Sariska	13. Pandupol	2. Museum
3. Siliserh	14. Kankwari	3. Bharatpur Palace
4. Tijara	15. Tehla	4. Bankey Bihari temple
5. Neemrana	16. Pratapgarh	5. Deeg
6. Tatarpur	17. Rajgarh	6. Dholpur Palace
7. Bansur	18. Ajabgarh	7. Band Baretha
8. Taalvriksh	19. Bhangarh	
9. Kesroli	20. Naraini Matha	
10. Kushalgarh		

Proposed Blue Green Gateways Circuits in NCR at Table P-6.1.2.**Table P-6.1.2: Proposed Blue Green Gateways Circuits in NCR**

Circuit Name	Destinations
NCR Blue Green Getaway Circuit -I	5 No-Okhla Bird Sanctuary, Suraj Kund Lake-Badkal Lake- Damdama Lake-Asola Bhatti Wildlife
NCR Blue Green Getaway Circuit -II	9 No-Okhla Bird Sanctuary -Asola Bhatti Wildlife Sanctuary -SurajKund Lake - Badkal Lake-Damdama Lake-Sultanpur Bird Sanctuary -Khaparwas Wildlife Sanctuary- Bhindwas Wildlife Sanctuary-Nahar Wildlife Sanctuary.
NCR Blue Green Getaway Circuit -III	4 No-Keoladeo National Park-Band Baretha Wildlife Sanctuary- via Rajghar Siriska Tiger Reserve-Siliserh Lake



Annexure-P-6.2

Suggested Policies - Tourism and Heritage**A. Making NCR - A Tourism Hub**

1. NCR States should make efforts to 'Create an elegant barrier free NCR. Another action shall be for preservation of historic scenery – restoration of historic structures.
2. Heritage, Cultural and Tourism sites should be clearly identified on the land use plan of towns and cities to prevent encroachment and inappropriate development in their precincts.
3. Any pollution or dust creating activities like stone crusher, dumping sites should be strictly prohibited near or along state identified Heritage, Cultural and Tourism sites, across NCR.
4. Following key stakeholders should work together/ in tandem for making NCR a Heritage-Cultural- Tourism Hub/ Destination in Asia and World are at **Table P-6.2.1:**

Table P-6.2.1: Key Stakeholders for making NCR a Heritage-Cultural- Tourism Hub/ Destination in Asia and World

Stakeholders	Suggestive Role
Government Agencies and Local Bodies	Conservation, Governance, Information portal, Helpline/Emergency, Education, Electricity & other infrastructure, etc,
Private sector	Infrastructure, Amenities, Philanthropy & Conservation
Institutions/ Individual Experts	Expertise, Domain Knowledge, Training & Skilling
People/ Communities	Visitors, Local communities comprising citizens, students, craftsman, artists, performers, guides, other service providers etc.

5. Champaner -Pavagarh Archaeological Park as best practice/ experience should be followed in NCR for finding innovative answers for the protection of heritage area and promoting tourism activities.
6. Short term tourists add to population of an area and facilities should be planned for them as well. Strategy should be to have High-grade cultural facilities for which action may be to provide 2-3 theatres, 6 galleries, 1-2 museums and 4 libraries per lakh population¹⁰.
7. Prepare plan for protection and rejuvenation of potential waterways and take actions to enhance sustainability and live ability by improving and managing access to waterways for recreation, tourism, cultural events and water-based sports and transport. Design places for people, increase access to open spaces, and have great places that bring people & environment together. All towns/ cities above 10,000 population should have at least one water body for recreation and cities above 01 lakh should have at least two water bodies.

B. Safety, Security, & Accessibility

8. Proper security arrangements be made by constructing walls/ fencing and trained tourist guides-cum-guards may be adequately deployed at all tourist site. A security system is important for all tourist areas, Heritage sites and cultural events to ensure safety of the site and people visiting them.
9. Tourist police and women's security is of utmost importance in the region. NCR States should have and expand Tourist police facilities in a coordinated manner.
10. Ensure comfort and safety for international visitors/ tourists, by way of removing language barriers through Multilingual support at transit hubs such as major railway stations and stations that offer direct airport access, by easy to understand signage – digital signage and using advanced technologies actively, etc.
11. Heritage, Cultural and Tourism sites should be hygienic, pollution free, universal accessible, disabled friendly & equipped with world class facilities. These sites should also receive priority in transportation and other infrastructure planning.

¹⁰ In Line with Shanghai

12. Suitable multilingual grievance redressal system for tourists be established in each sub-region with 24X7 facility and different digital platforms be utilized in this regard. The local administration should have a ready response teams for grievances.

C. Skills, Training, & Capacity Building

13. State Departments related to Heritage, Cultural and Tourism should collaborate with Tourism & Hospitality Skill council (THSC) and such councils at States level to look into skill training of tourist guides and tour operators including soft skills, at or near the respective sites, preferring the local population who are living the culture, as may be applicable.
14. Refresher courses for Tour Guides & Operators should be mandatory and continuous refresher courses be arranged periodically for keeping them updated to international standards. The courses can also be as videos recorded in local language. Important words/ terminologies of languages of main tourist origin countries should be compulsorily taught to all guides & operators and specific foreign languages proficient guides be developed.
15. Avenues of communication amongst concerned government departments / officials and Tour Operators & Guides, should be open at all times, as feedback received & action on same by authorities shall be mutually beneficial to visitors, operators, guides and departments.
16. The tourist police in NCR should be trained to assume the dual role of security police and guides.
17. Crowd management is important as more footfalls although means more revenue but also demands better facilities and arrangements to make each visitor feel important and valuable guest in this regard, special arrangements be made at local level for crowd management during mass gathering events in NCR. Necessary training arrangements for all concerned also be made in each sub-region.
18. State may adopt one or more of the following suggested strategies to implement the projects listed below:
 - (i) Adopt Revenue Generation Model through PPP Schemes,
 - (ii) Professional and focused marketing effort with Information Technology and Promotion may be adopted
 - (iii) Each ASI site to be treated as separate profit centre. For example Domestic Tourists Marketing could be developed and implemented for capitalising each heritage site to its optimum interlinking both tangible and intangible benefits, events, programs, performances besides the built heritage experience of the site.
 - (iv) ASI revenues to be ploughed back to the site
 - (v) National Culture Fund should be effectively utilized. The Ministry of Tourism extends financial support¹¹ under the Domestic Publicity and Promotion including Hospitality Scheme for organizing fairs/ festivals/ tourism related events may also be benefited from (as in 2020 the support is to 30 lakh for UT and 50 lakh for State).
 - (vi) Bring more sites under “Adopt a Heritage” & processing of the pending MoUs should be accelerated.
 - (vii) Crowd funding/ community funding/ CSR to be targeted along with Complete Tourist Experience to cater to all segments of Society and Officials, School students’, families, guides, drivers, police officials and others.

D. Support Infrastructure

19. Concerned departments/ agencies to make efforts to connect local communities to tourism by encouraging them to set up small enterprises to supply the tourism industry (accommodation, food and material), in an organized manner. Employment opportunities can be expanded by ensuring that investors and operators in the organized sector are encouraged to hire staff locally.

¹¹ INDIAN TOURISM INFRASTRUCTURE - Investment Opportunities & Challenges-FICCI <http://ficci.in/spdocument/23099/FICCI-report-TIM-2019.pdf>



20. NCR States make efforts to make the tourist/ pilgrimage/ historic/ cultural spots more visible and inviting, by developing aesthetics of the site and surrounds, routes to the site from the nearest arriving point, hygiene, and quality amenities & facilities.

E. Heritage & Culture- Conservation & Promotion

21. A 'Common Heritage Conservation Policy for NCR' can also be formulated by the Ministry of Culture, Govt. of India/ ASI in collaboration with NCR State Governments, so that all agencies can work in tandem. Ministry of Tourism, ASI, State Department of Archaeology, Tourism and Planning departments to ensure that their works/ projects are in accordance with the Common Heritage Conservation Policy for NCR'.
22. Conservation of heritage be adopted as part of the mainstream development activity, as it also relates to the employment in local communities in crafts, and crafts related activities and thus an inclusive culture milieu be cultivated.

F. Planning & Design

23. While planning for sustainable tourism infrastructure, integration of basic infrastructure and amenities along with all tourism facilities may be looked into and developed.

G. Awareness & Publicity

24. Periodic awareness and publicity and campaigns be launched to promote heritage and tourist attractions, cultural activities, congregations and other events of NCR for both national and international outreach.
25. State tourist departments and individual organizations/ departments handling/managing heritage & tourist destination points, may collaborate with other national and surrounding tourist destinations to publicize each other's attractions. This will enable mutual publicization of each other tourist destination attractions which could be a part of tourist circuit.
26. On-line 'Virtual Museum' tours be designed to publicize tourism resources and visit experience that awaits the visitors and thereby attracting interest from people.
27. Common objective should be to prepare a comfortable environment for national as well as international visitor and small efforts like having multilingual signs and having mix of Indian and western-style toilets etc. would be helpful.
28. Use digital platforms, print media, broadcast media, outdoor advertising, etc. for creating awareness about NCR tourism, especially for lesser known points of interests in NCR.
29. Each district should come up with its specific tourism resources publicity plan/campaign, to attract interest from foreign people.
30. States should fix annual targets towards achieving the indicative Tourism KPIs as given at Annexure-P-14.6, under the guidance of Ministry of Tourism.
31. Concerned departments need to ensure free flow of authentic information regarding new policies and new developments that are required and feedback from ground.

H. Cultural Resources of a Place

32. Database on Cultural Resources of a Place could include:
 - (i) Community Cultural Organizations-Ethno-cultural Organizations (Government agencies, NGOs, Zonal Cultural Centres, University research groups), Educational Institutions
 - (ii) Natural Heritage-Regional/National Park Botanical/Zoological Garden, Lakes, Wetlands, Water bodies River, Forests, Sacred Groves, Farms & Orchards
 - (iii) Intangible Elements-Stories, Folklore Customs Oral Traditions Religious Ceremonies Cultural Practices Cuisine



Local Healing Practices Traditional, Knowledge

- (iv) Festivals, Fairs and Events- Seasonal Festivals Fairs Religious-cultural events
- (v) Built Heritage-Built Heritage Properties Archaeological Sites Local Monuments, Tanks, Baolis or Stepwells
- (vi) Creative Cultural Occupations-Classical & Folk: Musicians Dancers Actors Singers Folk and Tribal artists Craftsmen, Artisans
- (vii) Creative Cultural Industries-Art & Craft Initiatives Cottage Industries Agri-products Self Help Groups (SHGs) Theatre companies or Dance troupes
- (viii) Spaces & Facilities-Theatres Libraries/Archives Art/Craft Centres Museums Village Chaupals Other Cultural Spaces Community Centres

I. Other Suggested Policies which could be elaborated in Sub-Regional Plan & Master/ Development Plans:

- 33. Detailed framework of policies regarding protection, conservation and management of heritage sites and the mechanism for social safeguard should be provided in the Sub-Regional Plans.
- 34. **Detailed mapping & verification of following should be done as part of each Sub-Regional Plan-2041:-** (a) Existing areas of heritage, cultural, natural and tourism importance, (b) Ranges of cultural resources, tourism activities and planning projects which will be a great base for including Heritage and Tourism in mainstream development, (c) Newly upgraded area of heritage, cultural and tourism importance, (d) Verification of heritage monuments/ site of all types i.e. man-made & natural or tangible & intangible heritage, & (e) Prepare a detailed digital catalogue of such sites to check whether they still exist and if they can be recovered or resorted. Digital catalogue should be used to attract travellers and researchers to disseminate knowledge.
 - a) **Regional Database and Documentation** - Archaeological Database should be made on GIS Database for monuments and sites to be authenticated and validated with ISRO.
 - b) **Technology use for National Heritage** - New technology like Photogrammetry & 3D Laser scanning should be used for documentation, surveys, excavation and conservation works. LIDAR (Light Detection & Ranging) and Drone Surveys to document monuments & sites.
- 35. Make a list of important sites other than world heritage and Govt. of India, ASI/ State Archaeology Departments and provide phasing for their development. Further, a checklist of development needed in each of such site be also prepared along with the baseline information.
- 36. State, ASI, Tourism and TCP departments must ensure that a conservation policy is reflected in their legislation. For heritage contents, a method has to be formulated and followed.
- 37. The 'systems approach' be adopted to look at the cultural resources carefully and all information/ data has to be mapped accordingly. The collected data must be constantly upgraded. An interdisciplinary Technical Committee can be formed at sub-regional level with the participation of stakeholders to operate and monitor the process of collection and management of the Cultural Resource database.
- 38. The natural heritage components should be identified and inventoried for example through the identification of natural resources such as rivers, streams, hilly areas and national parks. Such specific places in each sub-region should be identified & earmarked through corresponding Sub-Regional Plans in addition to few which are provided in the Regional Plan. Sub-Regional Plan / States should identify such natural streams/rivers/water bodies/ other natural formations which are well entrenched in the public psyche, and declare them as natural heritage sites. Such sites shall be protected and conserved as per the conservation policy framed for this purpose by the MoEF&CC, ASI and other concerned central or State Authorities. Where such sites are already specifically not declared as protected under any Central/ State law, in such cases the District Magistrate shall form and chair a committee to oversee the conservation and management of such sites and where central/state laws already exist, with regard to any specific natural heritage site selected as above by the state govt., these laws shall be followed.



39. Culture should be an inherent part of the concept of 'quality of life'. The cultural needs of a society thus need to be considered along with economic and social aspirations, especially in the context of tourism, tourists and local communities. Important aspects to be considered to ensure efficient and effective promotion and facilitation of Cultural and Heritage Site would include focus on:
- How is promotion of the cultural and heritage value of heritage site/monument happening?
 - How are livelihoods for local communities of these sites being generated?
 - How is employment being created through active involvement of local communities?
 - Is tourism being harnessed enough to address local economic imperatives?
 - Is local cultural heritage being integrated in this scheme?
 - Are local governments and local communities being involved effectively?
 - Is expert knowledge and public opinion reflected in the projects?
40. **To overcome issues, Checklist on following aspects to Promote and Facilitate cultural and heritage site should be prepared to enhance the value of heritage sites:**
- Skill development initiatives should ideally factor in development of local creative, cultural skills and occupations around crafts, performance and oral traditions, and be tailored to local needs and context
 - Interpretation Centers: comprehensive information on cultural heritage, history, arts, crafts, and available resources
 - Maps, Brochures and Publications
 - Cultural events in sync with the local heritage and available cultural spaces
 - Certification for heritage hotels, arts and crafts, Yoga and Ayurveda centers
 - Heritage Volunteering training programs for local guides, university students
 - Theme-based Heritage walks by locals
 - Arts, crafts and food workshops for locals and visitors
 - Temporary exhibitions showcasing different aspects of local heritage
 - Temporary Haats for crafts
 - Food festivals
 - Chance for locals (skilled /non-skilled categories) to be involved in conservation activities
 - Website with all the above information
 - Use of Technology in Museums
41. **Local administration should work towards:**
- Resolving issues of limited hours of experiences and limited seasons to experience: may not be same for all sites, and should be responsive to demand e.g. Delhi is a diverse city with multiple visiting experiences, but visitor is provided with less time to explore.
 - Working out and promoting Fly –drive vacation options
 - Offering platforms like Delhi Walks/ Jaipur Walks, built around core values (and not infrastructure) involving community participation and being Neighbourhood driven along with being Age and gender sensitive
 - Delhi acting as a mere touchdown city : Singapore which less than half the size of Delhi, keeps on reinventing its tourist facilities for attracting repeat visits of international tourists as well as its local citizens



- e) Efforts should be made that visitors who are coming to a city should stay and spend some time, and not just visit a site and return back. Infrastructure be such that each site could provide as option to stay and visit the neighbouring sites of importance for not just foreign tourists and but domestic tourists as well.
42. Technology should be used for e-governance & one-window for permissions and clearances as well. Advanced Technology for Promotion and Marketing of sites needs to be actively used to cater to all visitor kinds – school children, families, researchers & other segments of society.
43. Focus of Governments should also be to tap tremendous opportunity to engage competent private investors to run and maintain different Heritage Site, Old buildings, Forts etc. through PPP mode which will finally enhance the overall economy and employment at local level.
44. Check styles of point-of-sale materials in market, e.g., online operators, travel publications, retailers, souvenirs, etc. Modes of stay like bed and breakfast (B&B) in small lodging establishments to offer overnight economic & affordable accommodation and home-stay, etc. should be promoted, especially in small and medium towns and rural areas across NCR.
45. Efforts like the Udaan scheme of GoI where small cities are being integrated and private airlines being offered international licenses should be promoted and continued to improve Air connectivity hurdle, which is key in the tourism sector for international tourist attraction. Cities and towns across NCR should be well connected with larger cities like Delhi, Mumbai, Kolkata, Bangalore, Ahmadabad and Chennai.
46. In collaboration with IRCTC for Delhi Mega Darshan project plan and develop the following circuits across NCR - (a) Bishrakh Circuit Greater Noida; (b) Faridabad-Gurgaon-Mewat Circuit; (c) Sonipat-Panipat-Rohtak Circuit; (d) Jhajhar-Rewari Circuit; (e) Bulandshehar-Gautam Buddh Circuit; (f) Gaziabad-Bagpat circuit; and (g) Alwar circuit
47. The basic requirements for the development of Tourism Infrastructure, but not limited to, to be addressed across NCR includes: (a) Accommodation – Hotels, lodges, tented accommodation, tourist complexes/ dormitories, wayside amenities, restaurants, tourist reception centers, etc. & (b) Tourist transport - Mini-buses, jeeps, etc. for wild life viewing; powerboat/ boats, for water transport; tourist coaches in selected circuits; special tourist trains, flights/ helicopter/ helitaxi, etc. Such infrastructures & facilities should be developed across NCR for accelerating tourism growth, as per local requirement.
48. Make area/city/region easy for sale by informing customers of where & how they can experience. Concerned agencies & stakeholders should upload consumer testimonials from within international, national & local markets, and actively seek them out with visitors to NCR.
49. States and concerned department to come up with clear policy for Tour Guides & Operators. Selection process of guides should be transparent and also continuous. Technology be used to do the selection online through remote interviews by experienced team and Categories of guides can be created. Young interns for guide profession can also be thought of. Nearby schools and colleges can be scouted – especially for young persons who are looking for alternative and interesting professions. Summer training as guide interns can also be introduced; this will have a win-win effect – fresh enthusiastic guides from local community will improve tourist experience, plus this will strengthen the community bonds with the local heritage & cultural strengthening the economic rationale for tourism. Tour Guides & Operators and Local Authorities as well as the Tourism, Cultural and Heritage departments in NCR should work in collaboration.
50. The profession of Guides is not much respected and due to background of guide profession & reasons like reasons no fixed pay, no smart turnout, etc., many fresh young guides & educated outsiders do not join this profession. Therefore, for making the guide a professional, smart, well provided for, occupation, with not only all labour benefits but also treating them as knowledge workers (with a decent minimum salary plus bonuses based on tourist feedbacks). This will bring about a paradigm shift in the sight-seeing experiences around monuments. This will have a cascading effect on all aspects of tourism industry. Further, the tips system for



guides could be remodelled on the lines of other hotels and hospitality practices, for instance tips could be part of service charges; and /or tips could be pooled at one place and shared as per set policy, with guests having a choice to make special mention of a particular guide who would be entitled to a higher share from this pool.

51. While infrastructure is one part of the puzzle, training people and communities at the same time is the other essential aspect, especially in soft skills of communication, knowledge of local culture, and creative and innovative approaches to building an appealing ‘story’ of the heritage site or monument
52. Strategy for NCR to continue to attract visitors from around the world as a popular tourist destination should be brimmed with the spirit of ‘*Atithi Devo Bhava*’. Anticipating needs is at the heart of the concept and it is certainly fair to say that in NCR utmost care is being given to its visitors. Action involving spread of volunteerism, creating a welcoming environment, increasing communities support and promoting the Delhi NCR brand should be supported in each sub-region by the authorities, local governments and stakeholders. NCR brand’s message to be disseminated around the world through steps like creating a logo and catch phrase, sharing the concept of NCR with residents and private sector companies, and airing TV commercials abroad.



CHAPTER-7. WATER, DRAINAGE AND SANITATION

Suggested Policies - Water, Drainage and Sanitation

1. Water and Drainage

- 1.1 All opportunities should be utilized to recharge ground water as proposed by the Central Govt. under various schemes.
- 1.2 As drainage is closely related to overall water management, the relation between rainfall in and local floods, due to overflowing of water from rivers Yamuna, Ganga, Hindon, Sahibi, should be considered while planning and upgrading drainage infrastructure in NCR.
- 1.3 Areas surrounding the Aravalli Ridge may be treated to allow higher subsurface recharge by constructing trenches, gully plugs, gabion structures, etc. Geo-tagging of initiatives should be done with pictures and regularly updated on the NCR Geo-Portal.
- 1.4 For **conservation and restoration of water bodies, ponds, etc.**, all NCR districts should focus on the policy of **'Identify, Repair, Renovate and Restore'**. Water bodies, ponds and lakes should be revived by way of catchment treatment, de-siltation work and deepening of ground water recharge with provision of recharge shafts.
- 1.5 Revived local and regional water bodies can be also utilized for various activities like tourism (water amenity spaces), cattle use, fairs, boating, recreation, etc. based on their potentialities.
- 1.6 All potential recharge spaces like forests, water bodies, rivers and tributaries, lakes, large open spaces like gardens, parks, etc. should also be identified and protected from encroachments, siltation, depletion, and pollution.
- 1.7 Future construction of higher order roads in the region should follow natural slopes as far as possible and also view roads as carriers of storm water. Each urban settlement should be divided into several manageable parts and all these divisions should be demarcated based on natural parameters. Master/Development Plans should attempt, as far as possible, to localize surface runoff in these divisions by creating recharge spaces at local level.
- 1.8 Possibilities of having river policing by a dedicated unit may be explored and enforced for securing rivers and other water bodies in NCR, by the respective states.
- 1.9 **Artificial recharge and rainwater harvesting** should be given priority. **Rainwater harvesting** shall be one of the mandatory provisions while granting building permissions for any development project and industries.
- 1.10 The NCR states need to have a single digital platform for all issues related to water and drainage including interstate issues. Digital storm water management should be promoted to help practitioners to scale up rainwater harvesting and improved storm water management for sustainable water management including urban flooding in the NCR.
- 1.11 For comprehensive monitoring and evaluation, a separate cell should be set up in each state for water resource tapping and utilization with the aim of achieving water security in each sub region of the NCR. Introduction and adequate use of appropriate tools of integration such as GIS and databases, need to be promoted, if the basic requirement of integrated development of NCR in water management as well as other sectors, has to be fulfilled.
- 1.12 Water laws for NCR sub-regions should be reviewed/amended to include all residents living in the region, irrespective of nature of their place of residence. It means that total water demand should include water needs of slum dwellers, daily migrants, residents living in unauthorized colonies along with residents living in planned areas.



- 1.13 High quality treated wastewater should be also used for drinking purposes of animals. A separate water network to distribute treated wastewater of high quality should be built throughout the NCR. Municipalities and concerned State departments should build this second network. NCRPB's funds along with other Central Govt. funds can be used to build this network to agricultural fields and other parts of the region.
- 1.14 Steps towards adopting site-specific indoor and outdoor solutions for efficient residential water use and distribution of water-saving devices, rebates for use of water saving fixtures, programmes promoting replacement and retrofitting of water efficient toilets will enhance water management in residential areas, should be promoted across NCR.
- 1.15 Required portal can be made with the help of the National e-Governance Division (NeGD), Department of Electronics and Information Technology, Government of India and these can be further linked with the 'NCR Geo-Portal'.
- 1.16 The Atal Bhujal Yojana should be implemented on a priority basis and enforced in all sub-regions. States should encourage community involvement, strengthen groundwater governance institutions and provide performance-based incentives across the sub-regions.
- 1.17 In order to protect and restore vegetated riparian buffers, maintain naturally functioning floodplains, and preserve **wetland** buffers to manage storm water and improve water quality. Specific guidelines can be issued by MoEF&CC in consultation with concerned Central Ministries and NCR State governments.
- 1.18 Normally, rural **drainage** is designed to drain for 03 days rainfall of 05 year frequency and hence, submergence for 02 days is involved but with high value crops, this should be unacceptable. Similarly, urban storm water drains are designed for a 05 year return but this also needs review as while land flooding for upto 03 hours may be acceptable once in 05 years in residential areas, however, it cannot be accepted in commercial or industrial areas. Hence, better safety is required while designing drains and norms be frames to address the issue.
- 1.19 Detailed analysis of contributing areas to each **drain** along with drain's adequacy and carrying capacity for current and future scenarios should be evaluated by ULBs and PRIs. This task should be initiated in phases starting with Metro & Regional Centers to be finished by 2025, followed by remaining towns & finished by 2031. This should also be undertaken for rural clusters in a phased manner and finished by 2031. All SRPs should include phasing details of building of capacities of all drains.
- 1.20 All-natural **drains** should have a '**right of way**', which may be depicted in all maps, plans and documents of the area.
- 1.21 All **lakes and ponds** of 02 acre and above shall have catchment area delineated, which shall be depicted in all plan documents. Except plantation, water bodies, water harvesting components, compost making and paved walk ways not exceeding 10 percent of gross area only should be permitted within **right of way of drains** and catchment areas of lakes. It may form part of green corridors.
- 1.22 Public awareness campaigns should be also organized through societies or trusts for the **revival and rejuvenation of water bodies**.
- 1.23 **Unaccounted for water** should be reduced across the NCR and specific targets should be provided for each district in the respective Sub-Regional Plans and Master Plans in this regard. States should give status and targets in the SRP and Master plans for the same.
- 1.24 Waste water treatment and **water bodies' rejuvenation** are major elements of Jal Jivan Mission (Urban). NCR State should prepare their Action Plans / proposals in this regard and get funds from the MoHUA, and make this part of SRP.
- 1.25 One of the strategies identified for implementation under the comprehensive mission of the National Water Mission is to make a reassessment of basin wise water situation under the present water demand by using the latest techniques. States may work accordingly in this regard for their sub-regions.



1.26 Water reuse categories and typical applications:

- a) Agricultural land - Crop Irrigation, Commercial Nurseries
- b) Landscape Irrigation - Parks, Schoolyards, expressway median, Golf courses, Cemeteries, Green Belts, Residential
- c) Industries recycling and reuse - Cooling Water, Boiler Feed, Process water, Heavy Construction
- d) Ground Water Recharge - Groundwater Replenishment
- e) Recreational/ Environmental uses - Lakes and ponds, Marsh enhancement, stream water augmentation, fisheries, Snowmaking
- f) Non-potable urban uses - Fire- Protection, Toilet Flushing

1.27 Digital Support for Water and Drainage Planning

- (i) It is highly desirable to change the strategy of planning, development and management by introducing the appropriate tools of integration such as GIS and databases, if the basic requirement of integrated development of NCR has to be fulfilled. Otherwise, this shall remain business as usual and conditions shall keep on deteriorating further.
- (ii) Ample stress has been given on capacity building of various departments engaged in various aspects of water, wastewater, storm water and many allied areas. The capacity building shall be meaningful if a GIS framework is formulated that has the capability of integrating all the sub-components that interact with each other. NCT of Delhi already has such GIS framework in place with GSD Ltd. and possibility of the same be explored by other sub-regions.
- (iii) Surface water from Yamuna basin, groundwater as well as transported water from other basins in spatio-temporal manner be depicted using the GIS environment as a water resource layer.
- (iv) Mapping of Water Demands: Various demand layers such as domestic, industrial, irrigation, etc., be depicted in a spatial and temporal manner at each sub-regional level. Such depiction shall provide a easy understanding of status of water use for each area of sub-regions or districts and overall, at NCR level and reveal extent of water deficit created in respective areas.
- (v) Mapping of Water Quality: It is observed that many areas in NCR are having poor water quality due to varied reasons. It is important to map water quality status along with reasons for each sub-regions or district and accordingly required actions be planned in detail in the Sub-Regional Plans and necessary actions should be taken and evaluated for effectiveness.
- (vi) Non-revenue water: Firstly, map all areas that are implemented with water distribution systems or are in process of implementation. Secondly, these distribution networks should be evaluated for non-revenue water and losses of various other kinds. SCADA systems should be put in place for purpose of evaluating distribution system with respect to pressures and discharges at various strategic locations. This should be done by all ULBs/rural agencies in NCR.
- (vii) Impacts of implemented projects: Another level of information that needs to be implemented in the framework is about range of projects that are being implemented and planned. It is important to bring all projects that have been completed and are being taken up, in the GIS framework so as to get a proper assessment about up-to-date status. These may range from water supply projects to rainwater harvesting projects to sewage treatment projects. All these projects are part of integrated planning and management and are having lot of interaction that needs to be kept track of. E.g., If rainwater recharge structures have been recommended & implemented, then location of such implementation as well as targeted recharge is very essential so as to do requisite evaluation for effectiveness of action taken & investment made.



(viii) Demand management: It is observed that in NCR net demand is much more than the water availability in the NCR and deficit is increasing constantly. It has been seen that first priority has invariably been to target more water to become available from various sources, be it through rainwater harvesting or through some proposed structures e.g dams. All such options are equivalent to moving water from one use to other & is not termed to be highly beneficial in terms of bringing water security. Moreover, these options also have some externalities that are not always straightforward and need to be understood through proper analysis. E.g Over-extraction of water from river or groundwater has environmental implications. Other options that have been recommended & need implementation for demand management are through enhancement of water use efficiency and by reuse of wastewater. These aspects of water management are also required to be mapped and quantified on the GIS framework for proper evaluation.

1.28 **GIS Framework for Storm Water Management** - GIS framework is one of the best solutions for drainage system in NCR. A GIS framework loaded with Storm Water Management Model can be used for:

- a) Analyzing flooding situation in NCR corresponding to any rain, as well as relation between local flood and flood in Yamuna
- b) Capability of drain's capability to stimulate the flow and its vulnerability assessment has to be known. It needs to understand whether it is a natural drain or manmade drain
- c) Effective design of various interventions and analyzing impacts of various interventions through simulation
- d) Mechanism for effective deployment of desilting process
- e) Can become a segment of the Integrated Framework for Planning and Management of NCR having many other segments
- f) Help Delineate the NCR area into catchment area.

1.29 Regarding River rejuvenation, the responsibilities assigned by Hon'ble NGT which include following, may be followed by the stakeholders that include Delhi Jal Board, MCD, Upper River Yamuna Board, DDA, DSIIDC, UP and Haryana, Irrigation and Flood Control Department.

- (i) To provide universal access to sewerage system.
- (ii) To capture entire sewage and convey it to STPs, treat and dispose it safely.
- (iii) To prevent dumping of garbage in the drains and river.
- (iv) Desilting and Fencing of Drains: The process of desilting is started in the month of March-April and completed by the end of June-July every year.
- (v) Closing illegal industries, slaughtering and dhobi ghat in residential areas.
- (vi) Desilting and channelizing of drains preventing solid waste, idols and plastic waste from being thrown in the river or falling back into river.
- (vii) To prevent discharge of untreated industrial effluent and sewage into water coming into Delhi.
- (viii) Ensure all Industrial effluent is treated through CETPs before discharge. During COVID-19 lock-down improvement in quality of Yamuna in Delhi was observed because industries upstream were closed, and there were no floating population or squatters on Yamuna floodplains.
- (ix) Removal of squatters from the banks of the river and flood plain.
- (x) To release adequate water for dilution.
- (xi) **Flood Plain rejuvenation:**
 - a) All solid waste dumps within the active floodplain should be removed forthwith.



- b) Recycling units, farmhouses, cattle farms and nurseries to be relocated. Report on Restoration and Conservation of River Yamuna submitted to the National Green Tribunal with reference to Main Application no. 06 of 2012 (Tribunal's order dated 24 September 2013) recommended it. Nurseries located within the active floodplain to be relocated.
- c) Construction of new bunds, roads etc. within the active floodplains should be stopped and banned. It is recommended in the Report on Restoration and Conservation of River Yamuna.
- d) No filling of the floodplains or riverbed be allowed for ghats¹².
- e) The floodplain under built up areas be recovered.
- f) All recreational facilities for ghats be created close to the embankments or roads, by diverting channel for this purpose.
- g) Construction of new barrages and roads, railway and metro bridges, and embankments and bunds only in most exceptional cases.
- h) Identify additional landfill sites catering to the next 25 years of requirement.
- i) Protect riverbed from dumping of debris, MSW and Biomedical Waste.
- (xii) **Regarding River Zone:**
 - a) The 'O' zone as defined in MPD 2021, be designated as the river zone.
 - b) The River Zone so designated should be preserved and protected for the conservation and restoration of the river.
 - c) No development activity should be permitted within the river zone that encroaches upon the active floodplain, obstructs the flow or pollutes the river (solid waste or wastewater).
 - d) The existing constructions, facilities or within the river zone allowed as an exception, be treated as a Special Zone a regulatory regime to ensure that these areas do not impact water quality or flow of the river.
 - e) Barbed wire fencing in highly vulnerable areas for preventing encroachments and waste dumping in future. The polluter-pays principle should be enforced for defaulters. Restoration cost should be recovered from the defaulters.
 - f) No to Riverfront: CWC has recommended that Yamuna Riverfront Development is untenable and should be stopped – as the area of the proposed YRFD is within the active floodplain¹³.
- (xiii) **The Riverfront Development:** This could be done by a plan for restoration of the river and its floodplain as suggested below:
 - a) Controlled dredging of riverbed, barrage, wetlands and floodplain water bodies.
 - b) River training works (spurs etc.) to be relooked -extension and development be stopped, length of spurs should be restricted to allow a wider space for the river channel.
 - c) Culverts be constructed under the existing guide bunds of roads and flyovers, for flood discharges, aquatic biota (e.g., fish) and enhanced the groundwater recharge.
 - d) A mosaic of wetlands and floodplain vegetation having native biodiversity be developed, along the banks. Outfall from all the major drains (after treatment in STPs) to be routed through them.

¹² Proposed in the Report that "the floodplain under built up areas at Sur Ghat and Quidesia Ghat should be recovered. All recreational facilities for people visiting ghats should be created close to the embankments/roads where a channel taken out from the water course of the river can be brought for the purpose.

¹³ Views of CWC. Further, In the Report on Restoration and Conservation of River Yamuna it is recommended that the Yamuna Riverfront Development is untenable and should be stopped. It is noteworthy that the DDA itself admits on their proposed re-delineation of 'O'-zone (as per the Public Notice issued by DDA on 28 September 2013) that the riverfront refers to the area that lies outside the embankments. But the area of the proposed YRFD is within the active floodplain.



- e) A greenbelt or greenway be developed on both sides of the embankment, for controlling erosion, reducing sediment, reduce pollution, and beautification. Nature trails.
- f) Nature trails be provided across riparian areas for recreation to the public without losing the ecological functions of the floodplains.
- g) Control of sewage pollution must be given highest priority: interceptor sewer, capacity augmentation of STPs, enhanced efficiency, extension to un-sewered areas, and the present sewerage systems be rehabilitated.
- h) Adoption of new technologies to reduce BOD levels.
- i) Ensure the provision of environmental flows. Treated sewage and stormwater, if within acceptable quality norms, be counted for e-flows.
- j) A comprehensive master plan for sewerage for complete city.
- k) Agricultural activity on the floodplain be regulated to totally prohibit the use of agrochemicals (fertilisers and pesticides), & restricted to areas beyond 100 m.
- l) Access to the river channel for social/cultural/religious functions and recreation be allowed provided it avoids construction of paved (pucca) paths and does not cause any kind of pollution.

(xiv) **Institutional arrangement:**

- a) The river stretch in Delhi should be declared as a Conservation Zone under section 3 of the Environmental Protection Act 1986 (29 of 1986) and appropriate rules be framed for the human activities to be permitted or prohibited.
- b) High Power Committee for integrated management and coordination among various planning, execution, funding and regulatory agencies.¹⁴
- c) Responsible Organizations: Ministry of Environment and Forests, Government of India.

2. Sanitation

- 2.1 Use machines and modern technologies like Robots (e.g. Bandicoot) with machineries like Sewer jetting machines, Gulper machines, Grab bucket, Super Sucker machines and CCTV camera equipped machines, etc. for cleaning of sewer/ drainage line.
- 2.2 Wherever required hasten the process of land use change for critical services like sanitation and address issues like the **NIMBY** (“**not in my back yard**”) syndrome.
- 2.3 Concerned authorities should ensure substantial improvement in the quality of treated effluents for discharge from sewage treatment and industrial effluent treatment facilities, so that discharged water could be safely reused or discharged into natural water bodies.
- 2.4 All concerned authorities should promote proper disposal and treatment of sludge from on-site installations (septic tanks, pit latrines, etc.). Initiatives should be taken to ensure 100 percent safe disposal of human excreta and liquid wastes from all sanitation facilities including toilets and after collecting safely, it should be confined and disposed of after treatment, so as not to cause any hazard to public health and environment. Prohibit dumping of untreated wastes from septic tanks. Ensure that the faecal matter does not discharge in open spaces, drains, rivers and other water bodies.

¹⁴ In the said report, under institutional Arrangement, it is mentioned that the River Zone of the river Yamuna within the NCT-Delhi (together with the corresponding areas of U.P.), as identified in this report, is highly vulnerable to several anthropogenic pressures in the absence of regulatory measures and legal protection. The ecological integrity of the river, particularly the functioning of floodplain ecosystems, cannot be sustained even after restoration unless adequate measures are taken for its protection. The Committee therefore recommends that the 52 km stretch of the river Yamuna in the NCT of Delhi and UP should be declared as a Conservation Zone under section 3 of the Environmental Protection Act 1986 (29 of 1986) and appropriate rules be framed for the human activities to be permitted or prohibited.



- 2.5 NCR states to prepare statutory guidelines for reuse of treated wastewater specific to desired application or use. Needs of carriers of treated water to utilization sites i.e. tankers should be addressed at local level. Mechanisms should be put in place for continuous monitoring of treated water and soil quality when reused for irrigation purposes. The ground water quality also should be monitored regularly. Adoption of higher standards for treated water should be emphasized through protocols. The NCR participating states should associate national level institutions like NEERI, TERI etc., in drafting guidelines for use of treated wastewater and also for vehicles conveying and transporting wastes.
- 2.6 Necessary certification for decentralized sewage plant by CPCB, SPCBs or NEERI, etc. and manure produced from organic wastes to be taken up to ensure the quality of manures produced. This certification is important for building consumer confidence in the quality and safety of such manures. There is a need to create a business model such as agro-forestry whereby sanitation and municipal waste-based manure and organic fertilizer, etc., could be effectively consumed, like in Surat, Indore, etc.
- 2.7 This should be part of the conditions for granting building permissions across the NCR. Building byelaws should be amended or formulated such that all new buildings have separate networks for grey water and should have mandatory dual piping both at inlet and outlet levels. Above amendments in required laws/ byelaws be ensured by 2022. Retrofitting of all other existing group housing and multi-story buildings to meet above standards shall be ensured and included in the Sub-Regional Plans (SRPs) of the NCR participating States in such a way that Metro Centers, ensure
- 2.8 Invest in construction of sewerage networks, conveying systems and STPs; Reuse of effluents and Energy generation in STPs.
- 2.9 Dedicated teams for working on Swachhta related matters should be formed at each district, city, ward and village level for coordination, campaigns, trainings, etc. and regular training of event coordinators should be imparted. Regular campaigns should be organized for sharing of best practices at district, tehsil, city and lower levels towards solving various Swachhta related problems and issues.
- 2.10 NCR States/Cities should create business models such as agro-forestry where sanitation and municipal waste-based manure and organic fertilizer, etc., could be effectively consumed, like in Surat, Indore, etc.

3. Solid Waste Management

- 3.1 The concept of “nothing is waste” should be considered to utilize environmental resources and need to be preserved, and protected through technological interventions. The concept of circular economy ‘to use wastes as raw materials or resources should be implemented on priority. Specialized plants can be set up across the region with state-of-the-art technologies to utilize various types of wastes as raw material, generated within NCR and even outside NCR.
- 3.2 All cities and town should achieve 100 percent door to door collection and segregation of solid wastes at source into categories that is dry, wet, domestic and hazardous other than sanitary wastes. Local authorities should allow only the non-usable, non-recyclable, non-bio-degradable, non-combustible and non-reactive inert waste and pre-processing rejects and residues from waste processing facilities to reach sanitary landfills. The sanitary landfill sites shall have to meet all specifications. Every effort should be made to recycle and reuse the rejects to achieve the desired objective of “zero waste”.
- 3.3 Local authorities should provide incentives to design and encourage hybrid annuity mode for such facilities but on performance basis, to make this a viable business model. Similar steps should be taken for all other solid waste categories like bio-medical waste, e-waste, hazardous waste, plastic waste, etc
- 3.4 Local authorities should allow only non-usable, non-recyclable, non-bio-degradable, non-combustible and non-reactive inert waste and pre-processing rejects and residues from waste processing facilities to reach sanitary landfills.



- 3.5 Transportation of unsorted garbage and its dumping at unplanned/unapproved locations should be strictly banned and large financial penalties should be imposed. ULBs need to shift its approach from only collecting and dumping wastes to mandatorily getting segregation of wastes at source and explore possibilities of maximum reuse and minimum dumping at scientifically designed landfill sites.
- 3.6 The **domestic hazardous waste** like discarded paint drums, pesticide cans, CFL bulbs, tube lights, expired medicines, broken mercury thermometers, used batteries, used needles and syringes and contaminated gauge, etc. should be stored separately and given separately to waste collectors every day.
- 3.7 Civic bodies may create a mechanism to procure compost and give coupons that can be used in all Mother Dairy and Safal counters, PDS or similar outlets. On a trial basis, this model can be run in a few RWAs in each local authority.
- 3.8 The organic waste in the form of vegetable waste may be used for compost; and the food waste may be used as fodder for animals. Dry waste like paper, metal or plastic may be sold for recycling purposes. Only the rejects should be handled by municipalities.
- 3.9 Segregation and recycling of waste at source be made mandatory for all religious places in the NCR.
- 3.10 Bioprocessing of wastes can only be dealt and monitored by manpower appropriately trained in the fields of biotechnology and biosciences and such processing generates substantial labor employment.
- 3.11 Authorities and ULBs may explore possibilities for deploying and maintaining smart infrastructure like capacity sensors in waste bins and wireless networks for data transferring. All cities and towns in the NCR may undertake IT initiatives on the lines of smart cities. Citizens may be encouraged to participate through online media for waste-related activities which need urgent attention from the authorities. New technologies should be used to manage solid, liquid and agriculture residue waste. The National Mission for Clean Ganga (NMCG) may be approached as it undertakes environment technology verification (ETV).
- 3.12 The NCR states should install more waste treatment plants, waste to energy plants, etc., based on wastes being generated at the NCR level. There is a need to have separate strategies for industrial areas, gated complexes, regular colonies, unauthorized colonies, food grain mandis, dairy colonies, etc.
- 3.13 Local authorities should strengthen systems for segregation, collection, transportation and processing of segregated wastes. All local authorities should prepare a roadmap for taking steps to strengthen segregation, collection, transportation and processing. The roadmap can include: (a) Enforcement of segregation of wastes (b) Ward by ward mapping and coverage to ensure segregation at source (c) Building awareness in households (d) Distribution of bins (e) Monitoring of progress to achieve the desired objectives (f) Ensuring compliances from bulk generators (g) Ensuring compliances from street vendors (h) Creating infrastructure to collect segregated waste (i) Protection and training of waste collectors (j) Ensuring compliance over processing of segregated streams. (h) monitoring of above activities.
- 3.14 Some of global corporate recycling examples to follow are: (i) HP recycles print cartridges into Scanjet printers, (ii) Nike converts old athletic shoes into basketball and tennis courts, football and soccer fields and running tracks (iii) Tangent Technologies manufactures park benches out of scrap plastic packaging, which are then donated to Chicago's national parks by Unilever, which can be followed in NCR.

4. Suggested Micro level policies which could be detailed out in Sub Regional and Lower level Plans

A. WATER AND DRAINAGE

- 4.1 Segregation of sewage should be looked into in a scientific manner in all areas of NCR.
- 4.2 Each settlement should have effective and efficient de-silting plans as lot of pollutants get into drains which creates large amount of slit in the drains and back flows.
- 4.3 Options regarding treatment of storm water be explored to ensure the quality of water that is being used or



reused or is being utilised to recharge ground water.

- 4.4 Drain designs across NCR should cover requirements of high intensity rainfalls now being experienced possibly due to climate change. To accommodate the climate change, the return period rain values obtained from the past data should be increased by 10%¹⁵ and existing drainage in built up areas be revamped and remodelled accordingly.
- 4.5 Drainage related agencies and departments in NCR should completely avoid activities like puncturing sewer lines and draining sewage into storm drain in the event of blockage. Such punctures are invariably never mended and sewage is allowed to flow into drain forever. Agencies should resort to using latest mechanisms such as super suckers for de-clogging the sewer lines, and dedicated funds be allocated for regular upgradations¹⁶. Hon'ble NGT order of January 2015, regarding Sewerage Master Plan of Delhi, already specifies that no sewage should be allowed to enter the storm drains even from unauthorized colonies; interceptor sewers should be set-up wherever required to trap the sewage coming out of such colonies and take it to the nearest sewer line or STP. It is important that such measures shall be taken across NCR and its implementation should be monitored for effectiveness.
- 4.6 No construction should be allowed inside any storm drains. There are two specific violations that are usually observed; utilities are laid inside the storm drains and pillars of elevated roads/metro are built inside the storm drains. All identified encroachments in drains be removed and no further encroachment along and, in the drains, be ensured, throughout NCR.
- 4.7 Design of new storm drains should not be done in isolation. Overall impact of any new drain on the existing storm drainage system should be studied. Data collected and modelling system deployed as part of the IIT Delhi study should be used for checking design feasibility of any new drains, in Delhi and its adjoining areas. Similar action should be taken for other cities of NCR and districts of Haryana & Uttar Pradesh, adjoining Delhi may initiate the action with integration with Delhi model, in the first phase to start with.
- 4.8 Identify and rejuvenate the lost and ignored water bodies. Water bodies act as detention and recharge basins. They should be continuously monitored and maintained in order to reduce runoff into storm drains at local level.
- 4.9 Conserve water bodies as sources of aesthetics and recreation
- 4.10 Local administration should plan and identify places which can be used under circumstances of flooding. Manage the wider drains or nalas with drain flow in the middle portion and use the banks for gardening. Flood Management Plans should be prepared for all flood prone areas. Integrate Storm-water Management Plans in the development of municipal plans.
- 4.11 MoHUA manual on urban drainage be referred and help and assistance of IMD be taken for the data of respective sub-regions/ districts.
- 4.12 Review the municipal plans for integrated environmental sanitation. Guidelines for water supply systems, sewage, urban cleaning, integrated solid waste management and urban drainage, formulated by the Government of India, should be thoroughly implemented.
- 4.13 Reduce or mitigate storm water impacts of surface transportation.
- 4.14 Porous and Permeable Pavements be promoted for Storm water harvesting
- 4.15 Implement land use policies and development control strategies which support integrated storm water management and water conservation objectives. Introduce Loop Closing System for Water Management.

¹⁵ For construction of sewers system "the design infiltration value shall be limited to a maximum of 10% of the design value of sewage flow". http://cpheeo.gov.in/upload/uploadfiles/files/engineering_chapter3.pdf

¹⁶ IIT Delhi in the drainage Master Plan for Delhi quoted that "The current practice of DJB of puncturing sewer lines and draining sewage into storm drain in case of blockage should be stopped and suggested that DJB should use latest mechanisms such as super suckers for de-clogging sewer lines."



- 4.16 In case watershed is water deficit following steps could be considered
- (i) Importing water from a nearby water surplus watershed (river linking on a small scale).
 - (ii) Making efficient use of water -both in irrigation and industrial sector- thus resulting in net saving of water.
 - (iii) Arresting water leakages in the piped water supply
 - (iv) Taking up artificial recharge to Ground water and rainwater harvesting- based on proper plans prepared by state govt./CGWB
 - (v) Treating wastewater and using it for various purpose as per its level of treatment- Horticulture, building, industry, etc.
- 4.17 In case watershed is water-surplus, best ways to for efficient use of water such as following may be adopted:
- (i) One can still make the watershed more water efficient and save even more and recharge it so that the downstream watersheds are benefitted.
 - (ii) Have more area under crops- for increasing food requirement
 - (iii) Have more industries.
 - (iv) Assess the feasibility of transferring surplus water to nearby watersheds.
- 4.18 Re-allocation of water should be done source-wise and activity wise as per the management plan developed for each watershed.

B. SANITATION

- 4.19 **Land availability:** Land for new STPs construction is a major constraint and therefore it is imperative to earmark land for STPs in the Master Plans. MoHUA has published the Manual on “Sewerage and Sewage Treatment Systems” (2013) which may be followed.
- 4.20 **STPs and Decentralized Sanitation Systems:** Provision for landuse change, for setting up STPs & waste/ sewage treatment & processing facilities, should be delegated to Revenue Authorities at local level. This is necessary since have pulse of popular sentiments and address issues from NIMBY (not in my back yard) syndrome, if any, from site selection stage itself.
- 4.21 Emphasis should be on developing a decentralized sanitation system¹⁷. Then a semi decentralized system may be developed followed by large system. It should be mandated in small clusters and gated community. NCR States should subsidize the decentralized facilities, from expected savings by not construction of large, centralized facilities.
- 4.22 **Decentralized sanitation systems** are defined to be limited to single or several households with a maximum capacity of up to 20 persons. The two decentralized sanitation systems selected were household pit latrine and household septic tank. It was assumed that pit latrines can be constructed and maintained by the users and are operated as a dry or pour flush system.
- 4.23 **Semi-centralized systems** are defined in various ways in literature. They generally can be categorized by their number of connections of households, or by outline of the sewer system relative to the central sewerage system. (e.g., settlements, villages, small towns and suburbs)
- 4.24 **Centralized systems** generally have a wide range and high number of people connected¹⁸. Think of saturation of all habitations of all sizes with STPs or FSTPs, DSTPs of different sizes in a phased manner
- 4.25 **Design and Planning:** Planning for areas and regions, always need to consider the population density of the areas in focus. Approach for Delhi (pop. Density 12,500 persons/sq.km.) cannot be same as that for NCR

¹⁷ M/o. Jal Shakti

¹⁸ <https://www.witpress.com/Secure/elibrary/papers/ISUD13/ISUD13019FU1.pdf>



(density 788 persons/sq.km. with Delhi and 452 persons/ sq.km excluding Delhi). Locations or space be identified and specified for community toilets during planning for the area. Hence, while planning, street infrastructures (toilet, water & sitting facilities) need to be provided and space be allocated accordingly. Specifications for community toilets be of higher category and access controlled in different kinds of shopping areas, etc. It should be of same level as in Malls in the shopping areas, and can be paid, to ensure maintenance and careful usage.

- 4.26 Data pertaining to network service area, inflow in STPs, treated quantity, influent and effluent characteristics of sewage reuse quantity, expenditures, revenues, cost recovery, collection efficiency, sewer connections etc. at project level has to be responsibility of the projects.
- 4.27 **Technology:** Bioprocessing and biotechnology-based waste and wastewater treatment produce better results at substantial lower energy input and also provides more scope for production of energy (renewable). Bioprocessing fully recognizes interdependence among water resource, drainage, wastewater treatment & SWM and highly suited in tropical zone. Agencies need to engage more expertise (with work culture) to deliver this benefit.¹⁹ As per a case study for wastewater treatment to energy, located near Innsbruck, Austria, the Strass im Ziller tal facility is one of the best performing wastewater treatment plants in Europe. Through successive optimization efforts, Strass engineers were able to transform this facility into one that produces more energy than it requires for operations, thus making it energy independent.
- 4.28 Self-purification potential in a river or rivulet or surface water body receiving pollution load, depends on quantity of pollution load discharged and dilution available in receiving water body. Therefore, options for boosting self-purification potential in a natural body are to be explored. These may include either finding large quantity of fresh water to effect appropriate dilution or substantially improve quality of discharged treated effluent (by lowering multiple criteria BOD, COD, TSS, turbidity, total Coliform, SAR etc.). As large quantity of fresh water required for dilution may be available only from trans-boundary water projects which are entangled with consent of the neighboring countries, and it may be prudent to improve the quality of discharged effluent.
 - a. Phased targets for each criteria and differential for differential regions based on area type, capacity, downstream impact etc
 - b. Expert bodies like TERI to make/suggest such lower/better criteria/protocols
- 4.29 Explore possibilities & promotion of technology intervention for sewer cleaning to discourage manual scavenging. Robot, named Bandicoot, can travel up to a depth of 20 meters and municipal bodies in Kerala, Tamil Nadu and Andhra Pradesh have already commissioned it and have also trained manual scavengers to operate the bots from a safe distance.
- 4.30 Designs of STP like that in Chennai which has a sewage treatment renewable energy recycle of treated sewage²⁰ under a profitable model, be adopted. Such STPs have two-fold benefits and about 50-60% of cost of operations is reduced with green returns. The raw sewage from cities passes through various screens through treatment and the energy is produced to make the plants self-sustained and eco-friendly. NCR states may adopt similar approaches.
- 4.31 To handle the sludge from septic tanks, septage management could be considered. In terms of capital expenditure FSSM system involves approximately 20 times less per capita cost than centralized sewerage systems²¹. Few best practices in Fecal Sludge Treatment Plants²²:
 - a) Faecal Sludge Treatment Plant Odisha of capacity 75KLD²³
 - b) Faecal Sludge Treatment Plant Dhenkanal²⁴ of capacity 27 KLD with solar pasteurization unit, UV disinfection, solar panels used for running pumps, easy operations and completely closed system, gravity-based system.

¹⁹ Expert Inputs

²⁰ Va Tech Wabag

²¹ Views from KPMG

²² <http://swachhbharaturban.gov.in/writereaddata/Day%201-Session%203-All%20PPTs.pdf>

²³ <https://scbp.niua.org/sites/default/files/FSTP%20Bhubaneswar.pdf>

²⁴ <https://www.cseindia.org/faecal-sludge-treatment-plant-at-dhenkanal-odisha-9722>



- c) Faecal Sludge Treatment Plant Leh²⁵, of 12 KLD capacity with planted drying bed technology implemented for the first time in India. It has DEWATS module which is used for treating the water which in turn keeps O&M costs low.
- 4.32 Treated wastewater of STP in urban and rural can be channelized and treated and further can be reused through suitable natural systems like Phytotid technology for treatment of sewage. There are about more than 35 Phytotid system with varying capacities form 2000 L/day to 1 MLD are working in the field successfully for treatment of sewage. The first ever plant was installed at Mumbai University, Kalina campus in 2006.²⁶
- 4.33 **Mapping:** Highlight the effectiveness of the sewerage system of every locality by identifying and demarcating all those storm water drains that are carrying sewage or industrial effluent. This is one of the major reasons that River Yamuna despite all efforts has remained polluted as pollution has not been tackled at the starting point when it enters storm water drains, and it becomes almost impossible to tackle pollution when it reaches the major drains like Najafgarh or Barapullah in NCT. DJB had revised their Sewerage Master Plan on direction from NGT to ensure that no sewage from any area is allowed to enter any storm water drain. GIS mapping of sewerage system of every locality by identifying & demarcating all those storm water drains that are carrying sewage or industrial effluent is critical and should be done by all concerned agencies/ department in each district and town. Geo-tagging of wastewater or effluent generation be undertaken on priority (in Mission mode).
- 4.34 **Monitoring:** Every household should have water quality and quantity monitoring at both entry and exit points of the house. This may also be Geo-tagged.
- 4.35 **Reuse of wastewater:** As more than 50% of treated water is consumed in toilet flushing, which is a total waste and misuse of potable water. Safe reuse of treated wastewater for toilet flushing can be considered as priority. Dual mode of flush discharging smaller quantity of water for flushing after urination be also promoted to help in water conservation. For safe use in flushing, processed wastewater needs to be completely odorless and free from suspended matters to leave no stain in WC pan. Further, the quality of processed water needs to prevent no slime formation in flushing device. In smaller campus this may economically delivered by on site polishing of processed water through DEWAT system of wastewater treatment. Experience in Namibia, Israel and Singapore is help full.
- 4.36 Chennai has achieved around 15 % of the city's water demand through water recycling. Around 8 % of the treated wastewater is sold to industries and up to 40.7 percent of domestic water needs in newly built houses are secured from in-situ wastewater reuse. In-situ wastewater reuse in residential areas and rainwater harvesting has reduced nearly 60% of water reaching the sewer system that has contributed to improved operation of sewer networks. Utilization of biogas for energy production reduces GHG emissions and also electricity consumption from city grid. As demand for onsite wastewater treatment systems increased, new markets for wastewater treatment manufacturers & businesses were created²⁷.
- 4.37 Sanitary waste, generated at the household level be wrapped in paper and handed over separately to waste collector, daily in areas where segregation is already happening.

C. Waste Management

- 4.38 **Landfill Sites:** Landfill is also the most expensive option when land cost is taken into consideration. Also when land requirement for SWM is worked out for two alternatives processing based on i) existing practice of transportation of mixed wastes to garbage dumps, and ii) decentralized SWM based on biodegradation of organic waste, both land requirement as well as operational cost reduces significantly besides elimination of pollution risk.

²⁵ <https://smartnet.niua.org/sites/default/files/resources/fstp.pdf>

²⁶ https://www.cseindia.org/static/mount/recommended_readings_mount/19-Phytotid-Wastewater-Treatment-Technology.pdf

²⁷ <https://www.iwa-network.org/wp-content/uploads/2018/02/OFID-Wastewater-report-2018.pdf>



- 4.39 **Infrastructure:** Waste-to-energy plants be planned cause lesser air pollution than coal plants, but more than natural gas plants. At the same time, it is carbon-negative, processing waste into biofuel releases considerably less carbon and methane into air than having waste decay away in landfills or the lake²⁸. Waste-to-energy plants are designed to reduce emission of air pollutants in the flue gases exhausted to the atmosphere, (e.g. NO_x, SO_x and particulates, and to destroy pollutants already present in waste, using pollution control measures such as baghouses, scrubbers, and electrostatic precipitators. High temperature, efficient combustion, and effective scrubbing & controls can significantly reduce air pollution outputs.
- 4.40 When the waste management is deficient (evident from low interception of waste, lack of waste reduction, processing, reuse and safe disposal) then substantial quantity of wastes are bound to find its way (through drainage channels) to natural water bodies (lake, river or sea) and further add to pollution load already created by discharge of deficient sewage or effluent treatment. NCR states and its related agencies need to take up incubation models²⁹ for 50 and 100 TPD SWM modules based on biodegradation of organic waste. Some such examples include, Panaji, 100 TPD SWM Project and Ghazipur, Delhi 100 TPD SWM project (funded by NCRPB).
- 4.41 **Waste segregation and disposal practices:** No C&D waste should go to the land fill sites. This construction and demolition waste could be put to this use as construction material. As per Indian Road Congress³⁰ the C&D waste needs to be processed and tested to be used as road construction material and for this a large-scale plant and small plants for which technologies are available.
- 4.42 All cities practice 100 percent door to door collection and segregation of waste at source into minimum three categories that of dry, wet, domestic hazardous other than sanitary waste. No garbage or leaves should be burnt in the open. Home and community composting is to be encouraged and reuse, recycling of dry recyclable waste through sorting at Material Recovery Facilities is a must. Ragpickers or erstwhile waste workers should be integrated into sustainable solid waste management system with proper personal protective equipment and proper working conditions.
- 4.43 **Waste producer responsibilities:** Adopting the strategy of Extended Producer Responsibility (EPR) wherein producers are given a significant responsibility – financial and/or physical – for the treatment or disposal of post-consumer products, steps like EPR Cess going into escrow account of ULBs to cater to budgetary requirements for waste management and sanitation be adopted by states as per feasibility and thus take steps towards formalizing EPR.
- 4.44 According to the E-waste (Management) Rules, 2016 every producer of electrical and electronic equipment listed in Schedule-I, can apply for Extended Producer Responsibility (EPR) in Form-I and obtain authorization from CPCB. As well as maintain records in Form-2 and shall file returns of previous year in Form-3 to CPCB on or before 30th day of June every year³¹.
- 4.45 All bulk generators must have facilities for separation, collection, processing of wet biodegradable waste within their premises and hand over the non-biodegradable, non-recyclable including hazardous waste to municipalities and corporations and pay for their collection and processing. All cities in the NCR for aim for Zero Landfills and if there is a small percentage only for non-degradable items which should be placed in secured or sanitary landfills and Not Garbage Dumps. It would be a good idea to incorporate the Service Level processing parameters that have been formulated for Swachh Survekshan and Garbage star rating as monitoring parameters, which also has a high component of citizens and Resident Welfare Association and Trade association participation besides IEC in educational institutions, public places and using ICT applications. Thereafter for decentralized and centralized or semi-centralized processing, different processing can be established in

²⁸ <https://www.powermag.com/energy-waste-greenhouse-gas-winner-pollution-loser/> and <https://www.prescouter.com/2017/10/waste-to-energy-technologies-available/>

²⁹ *Experts Inputs*

³⁰ *TERI*

³¹ <https://dpccocmms.nic.in/userMaster/consentPolicy.gsp>



different localities and locations to enable processing and recycling of maximum waste and least amount going to secured landfills.

- 4.46 Others: It is imperative that an approach of creating the information about the implementation of procedures/ infrastructure is highly desirable so that the loopholes can be identified and plugged. Following initiatives should be taken in this direction:
- (i) All entities relevant with respect to the SWM in NCR be mapped for both, the present infrastructure as well as the proposed infrastructure for the RP-41. For such mapping, each town should be covered and the fate of solid waste along with location (with capacity) should be indicated. For big cities it shall be more appropriate to show connection of the locality with the disposal/landfill site. It is important to understand as to what is the SWM policy of the city and is it adequate with respect to the projected growth. Most of the road sweeping and the Construction & Demolition (C&D) waste lands up either in storm water drains and water bodies which in turn shall result in the flooding of the areas because of poor disposal of storm water. Amount of waste likely to be generated from a construction or demolition site should be assessed by the municipality and its proper disposal ascertained. Public involvement is very important in this segment and procedures should be developed to engage public by using social media and other IT based applications. The framework itself can be very conducive in identifying the problem locations and thus shall help in creating focus and eventual arriving at the solution.
 - (ii) Each public utility shall have a social media account for complaints only and where identity of complainant shall be protected. A common complaint forum for all civic services in a sub-region should be created, where calls are recorded, documented and followed up/ tracked till satisfactory resolution of the problem – along with photographs of problematic site for records.
 - (iii) Such handling shall also be able to demonstrate the crux of the integration approach. Adequacy of the solid waste management has a huge reflection on the effectiveness of the sewage and storm water handling of a city. Some of the major problems of the sewerage and the storm drainage systems are on account of the solid waste mismanagement. Therefore, it is required to handle these three together along with their interaction.
 - (iv) To make waste collection sustainable, a mechanism be created to manage the system by monetizing it. e.g., a *Kabadiwala* who collects newspapers from consumers, sells it in the recycling plants at a higher rate, hence creating a supply chain. In this process, jobs are created, making it a financially viable model.
 - (v) As all Compost cannot be absorbed in parks only and local administration may look for other aspects as well.
 - (vi) Generally, operation of STP and SWM are dealt by staff trained in Civil, electrical & mechanical engineering fields who are trained to deal with construction and operation of electro-mechanical equipment only. This prevents utilizing specialists from biosciences who can deliver better operation and monitoring of STPS & Biodegradation of solid wastes. Trained Bio-scientists are better equipped in generating and sharing data on operation and performance monitoring of these components and the problem of data generation/ sharing shall get addressed. Necessary editions and updating be done accordingly, in staffing.
 - (vii) Opportunity for employment generation through creation of livelihood (income generation) with hand-holding support which shall generate employment in the knowledge based (organizing, technical knowledge and supervision) personnel:
 - a) Watershed Management
 - b) Constructed Wetland Treatment
 - c) Decentralized Bioprocessing (composting) of Domestic Solid Waste
 - d) Production of organic fruit, vegetable as well as livestock and pisciculture, supported by wastewater irrigation and organic compost.



- (viii) All bulk waste generators to have facilities for separation, collection, processing of wet biodegradable waste within their premises and hand over the non-biodegradable, non-recyclable including hazardous waste to municipalities and corporations and pay for their collection and processing.
- (ix) The issue of availability of land where composting can be done, be addressed by the states at both district and habitation cluster level. An institutional mechanism be set up to manage it so that the certified manures can be sold to various consumers (e.g., gardening in public parks), at district level. Agencies themselves can appoint private contractors to handle the task or can give it given to the department of Horticulture or the department Agriculture in the respective sub-regions NCR. This will help creating a supply chain and jobs. Appropriate certification mechanism shall however be put in place before recommending its usage.



CHAPTER-8. URBAN REGENERATION- HOUSING & HABITAT

Suggested Policies - Urban Regeneration- Housing and Habitat

A. **Planned Housing along Transport Corridors (TOD)**

1. As the population in housing pockets evolves, the amenities provided must also respond to meet their changing needs. Housing supply needs to be in the right areas & right type and should take into consideration unique character of local neighbourhoods. New towns need to be planned and designed with technology as enablers to bring convenience and nature closer to residents, for their well-being.

B. **Slum Improvement and Low Income Housing**

2. Housing supply for low and middle income group of people should be increased. Public Sector should provide Affordable Housing to the Low and Middle Income Groups and improve conditions in existing slums.
3. At micro level, alternative housing units be provided to people affected from infrastructure expansion projects like road widening, opening roads within the same area or nearby or direct compensation based on consultation.

C. **Institutional Housing**

4. It shall also be ensured that all new building for dwellings meet requirements related to 'accessible and adaptable dwellings'.

D. **Redevelopment & Up gradation**

5. To improve quality of living and reduce transport cost and pressure on transportation infrastructure, a "15 minutes neighborhood" by walk or cycle and walk to work should be planned in all new developments and also in all redevelopment areas including in slums, etc. across NCR. This will necessary require creation of mix-used zones both spatially -horizontally and vertically as well as earmarking a mix-used areas by recognition/ permission of mix-used in existing areas/redeveloped areas, TOD areas and another areas as required.
6. NCR should be made **slum free**. It is proposed to be achieved by using the TDR tool and reserving 10-15% of developed land area or 20-25% of FAR whichever is more for EWS and LIG.

E. **Vacant Housing and Stalled Projects**

7. NCR States should take necessary steps so that the large quantum of vacant housing in NCR towns is reduced. It shall be ensured that no residential areas/ projects lying vacant. Alongside, focus should also be on creating of infrastructure for economic activities and employment generation.

F. **Support Infrastructure**

8. To ensure fast development of NCR towns, it must be ensured that the projects are populated well. This can happen only when there is good support infrastructure in terms of schools, public transportation and safety. Adjoining areas particularly Meerut, Baghpat, Noida, Greater Noida, Ghaziabad, YEIDA, Gurugram-Manesar-Sohna, Faridabad-Bahadurgarh, Sonapat-Kundli, Ballabhgarh, Bhiwadi-SNB Complex, etc. should be connected with a high quality and high speed inter & intra-city train and bus services. Adequate social infrastructure like education, health, daily needs, recreational facilities, etc., should be created at local level and security of residential areas and housing complexes must be ensured. This will also help in fast occupancy of vacant housing.

G. **Other Policies which could be elaborated in Sub-Regional Plan and Master/ Development Plans**

9. Housing land requirement should take into account new household growth, existing inadequately housed households, households affected by redevelopment and miscellaneous demand (e.g. non-local students and buyers).



10. Key Aspects to be taken care in lower order Plans (District Plans) shall be Capacity; Viability; Good design; Environment ; Mix - a mix of housing types that allows people to relocate within their local area and stay connected to community services, friends and family; Supply; Affordable rental housing; Local character ; Social housing ; Delivery; Monitoring- homes completed & ready for occupation.
- (i) **Urban renewal**
11. Locational criteria for urban renewal investigation opportunities shall include:
 - a) Alignment with investment in regional and district infrastructure which acknowledges catalytic impacts of infrastructure such as RRTS, MRTS corridors, Orbital rail corridors, major expressways, etc.
 - b) other possible future investments areas such as opportunities created by enhancements to existing infrastructure such as upgrades to schools, open space, sporting facilities and transport
 - c) catchment areas within walking distance (up to 10 minutes) of centres with rail, light rail, RRTS, MRTS corridors or regional bus transport
 - d) efficient interchanges with a comprehensive walking and cycling network
 - e) areas of high social housing concentration with good access to services, transport and jobs
 - f) Distance from special land uses such as airports (YEIDA), railway stations, etc.
12. Promote urban restoration with an emphasis on the balance between home and work.
13. Redevelop underutilized parking lots near rail stations without constructing one new building.
- (ii) **Livable neighborhoods and Quality of life**
14. Necessary initiatives be taken to improve urban life in neighbourhoods through steps which may include:
 - a) Encouraging active façades,
 - b) Expanding the network of social and urban facilities: education, health, sports, culture, social assistance and food security
 - c) Elaborating the district regional plans and neighbourhood plans with participatory planning
 - d) Increase the number of open spaces/ parks in urban areas
 - e) Ending the requirement for a minimum number of parking spaces
15. Ensure that shade and shelter are provided with appropriate types and amounts of seating to encourage people to spend time in a place, where appropriate. This should be done in conjunction with the removal of any unnecessary or dysfunctional clutter or street furniture to ensure the function of the space and pedestrian amenity is improved. Applications which seek to introduce unnecessary street furniture should normally be refused.
16. Ensure that on-street parking is designed so that it is not dominant or continuous, and that there is space for green infrastructure as well as cycle parking in the carriageway. Pedestrian crossings should be regular, convenient and accessible.
17. Provide One-stop hubs allowing residents to go for a swim, shop for groceries and have dinner, all within the same development.
18. Ensure the provision and future management of free drinking water at appropriate locations in new or redeveloped public realm.
 - a) accommodate a greater variety and intensity of uses
 - b) connected routes and spaces that help to define the character of a place
 - c) Healthy Streets Approach



- d) Pedestrian crossings should be accessible and provide tactile paving
- e) effective management and ongoing maintenance
- f) lighting
- g) provision of free drinking water fountains

(iii) **Create Community-Centric & Connected Neighborhoods**

- 19. Planned Cycling paths to encourage alternative modes of transportation.
- 20. Well-connected public spaces and amenities to create new housing towns that serve the diverse needs of all residents.
- 21. To create more inclusive environments that encourage walking and cycling, precincts should be designed to be car-lite, prioritising the movement of people over cars whenever possible.
- 22. To safeguard and strengthen key natural habitats in new developments, water sensitive urban design features such as bio-swales and rain gardens should be introduced to manage storm water and cleanse water before it reaches our reservoirs.
- 23. Adopt Innovative strategies to conserve natural heritage, and to expand island-wide network of play corridors, parks, sports facilities and green spaces.
- 24. Allow residents to have more opportunities to connect with nature, enjoy a wide variety of recreational experiences.

(iv) **Technology and R&D**

- 25. Sixteen new emerging technologies have been identified, evaluated and promoted under PMAY(U). These fall under formwork systems (3), precast sandwich panel systems (6), light gauge steel structural systems (2), steel structural systems (2) and precast concrete construction systems (3). These alternate and sustainable technologies offer safer and disaster resilient affordable housing. These will also improve the quality of construction in a cost effective and environment friendly manner across states/regions and achieve economies of scale in urban areas.
- 26. Smart Homes – based on ICT infrastructure and modern technologies shall be regularly incorporated in the operation of home appliances.

(v) **Design and Planning**

- 27. While creating and developing any area/ town, it should be kept in mind and planned that how area will attract employment as that can help in decongesting the bigger cities.
- 28. Templates for cost and size of dwelling units and quality of housing could be prepared and developed which could help dwelling unit construction in proper manner, especially in lal dora areas and areas where no explicit approval provisions exist. Smaller utility accommodation/ rental housing for different income level and housing sizes should be elaborated.
- 29. Housing areas/ complexes developments and landscaping with Green & Blue Features should be done with following mandatory provisions:
 - a) Skyrise greenery to cool the urban environment, clean the air and soften cityscape.
 - b) Landscaping for Urban Spaces and High-Rises (LUSH) programme for providing incentives and greenery replacement requirements to integrate skyrise greenery within buildings.
 - c) Water sensitive design features, which are natural and environmentally-friendly aid sustainable rainwater management, also help to enhance the lushness of urban greenery while slowing down and treating rainwater runoff.



30. While planning and developing housing projects (affordable and sustainable) explore possibilities for the following:
 - d) Parks - Parks and squares covering over 400 sq. Mtr - 90% within 5 minutes' walking distance
 - e) Public space - 4 sq.mtr. community public space per capita Achieve planning goal of 4 sq. Mtr. per capita, including community parks, small squares, and street-corner green areas
 - f) Public facilities - 15 minutes' walking distance 99% public facilities within a 15-minute walking distance in communities
 - g) Travel - Average travel distance for the daily life needs will be limited to 2.5 km.
31. Preserve Sanctity of Industrial Areas by adopted followings:
 - a) Residential Activities should be restricted around Industrial areas designated for hazardous industries.
 - b) Buffer Zones around hazardous Industrial use Areas should be closely monitored for unauthorized residential activities.
 - c) Manufacturing Sector should be given due importance during planning phase which may involve moderately polluting industry or MSME.
 - d) Incentives for providing Dormitories/ Residential complexes within Industrial zones (other than Industrial Areas designated for hazardous industries) should be given.
- (vi) **Efficient use of land**
32. As suggested in the NITI Aayog's Three-Year Action Agenda (2019-22), cities should focus on vertical growth, adopting following measures:
 - a) Launch a mass campaign to sensitize cities and states on the benefits of vertical growth.
 - b) Provide capacity building to states and cities willing to undertake measures towards vertical growth.
 - c) Provide considerable rewards to cities that relax their floor space index (FSI) norms.
 - d) One of the key reasons behind India's horizontal sprawl is stringent FSI norms.
 - e) The discussion on changing FSI norms considering trunk infrastructure and other social issues needs to be expedited across India.
- (vii) **Norm and Regulation**
33. Advantages of Integrated Development with Higher FAR be benefited from. This may include:
 - a) Integrated development of individual dwelling units is conducive for better community interaction, efficient functioning of infrastructure facilities.
 - b) Encourage lower ground coverage and thus large open areas utilizable for water bodies, laygrounds, etc.
 - c) Opportunity of integrating neighborhood units with each other as well as the adjoining commercial belt will also help in reducing the transportation load. High rise buildings could be planned along the MRTS.
34. Proposed neighborhood plans should establish the criteria of high FAR, high residential density, improved quality of life with better civic amenities, education and health facilities at walking distances, increased living area.
35. Regulations should be well defined and elaborated so as to facilitate the implementation of the same at plot level. All necessary parameter and yardsticks should be well detailed in the Plans.
36. Formulate urban management tools aiming at discouraging the maintenance of vacant or underused lands.



(viii) **Access to Financing**

37. Investment in housing sector should be scaled up and Urban Local Bodies/ Development Authorities/ Agencies should be supported for developing housing projects and ensure that projects are properly executed and also that built assets are maintained.
38. Government projects should focus on the life cycle cost (LCC) approach to the construction of houses rather than the cost per square foot approach to ensure quality of construction and reduce expenditure incurred on the maintenance of houses.

(ix) **Skill Development**

39. It is necessary to ensure convergence of provisions under the National Urban Livelihood Mission, Pradhan Mantri Kaushal Vikas Yojana, Construction Skill Development Council of India and MGNREGS (for rural areas) for large-scale training of masons to meet construction activities.



Annexure-P-9.1

CHAPTER-9. RURAL DEVELOPMENT**Suggested Policies - Rural Development****A. Rural Planning**

- 1 Low cost houses, universal access to sanitation at household level, networked water supply at household level, building robust communication systems, other social infrastructure should be provided to improve the quality of life in rural areas. Better road connectivity among various settlements in rural areas should be provided connecting all villages within the next five years.
 - 2 Dissemination of relevant information on a regular basis to apprise rural population about new opportunities, on-going programmes, sources of micro-credit, market potentials, etc. should be provided by district level political leaders represented on zilla parishads, block samities and village panchayats.
 - 3 For efficiently using resources in the NCR and equal focus of rural and urban population should be placed in order to, efforts including Ecopolis40 for increasing resource use efficiency, linkage between urban system and ecosystem, de-materialization through circular economy. NCR States should have vendors/ facilitators for circular economy in each village and wards for respective sub-region and all such vendors/ facilitators should be registered on an Aadhar based platform.
 - 4 Exploit natural resources, and set up of agro-processing units, reinvigorate handloom industry with CSR interventions. Attract & incentivize private sector investments as well as CSR Trusts/Foundations in identified cluster developments and Rurban clusters through MSMEs/MNCs already having bases in the NCR.
 - 5 Village Development Plan will necessarily cover the spatial, sectoral and economic aspects. Various schemes related to rural development need to be dovetailed in the above NBMS structure for the rural areas. Town and Country Planning Organisation or Departments and expert knowledge institution may be associated and some model District Development Plans (DDP) and VDP should be prepared, to start with.
 - 6 Efforts for development of visitor amenities for promoting **rural tourism** must be initiated, in co-ordination with Department of tourism of respective states.
 - 7 Various schemes of centre and NCR States related to rural development be dovetailed with the policies and proposals of the Regional Plan/ Sub Regional Plans for their implementation. District Administration will have to incorporate various proposals while preparing plan of action for development of respective districts in various sub-regions.
 - 8 TOD should be allowed and promoted around/ along the railway stations, railway sidings, ICDs, railway yards, etc. in the rural areas.
 - 9 **Other suggested micro level strategies and policy provisions for districts and villages/ local planning**
- 9.1 **District level**
- (i) NRLM is also looking at commercial ventures, and districts should benefit from the same. Local area plans should be able to project the requirement of future jobs, in respective districts. Further, the possibility of these future jobs may be taken into account while planning for the training process. Apprenticeship Model may be promoted.
 - (ii) Necessary requirements to promote tourism activities around and near National Parks and Heritage Sites, be assessed and infrastructure provided for, within the prescribed / regulations.
 - (iii) Corridor Zone because of accessibility, lot of activities are concentrating. These activities need to be considered, analysed and accordingly allocation may be done.



- (iv) Linkage between urban ecosystems should be established through activities like market gardening, mixed farming and renewable energies, etc.
- (v) District administration may ensure that
 - a) Use of e-Governance at all levels for planning and monitoring.
 - b) Use of tendering mechanism of works at all levels.
 - c) Gram Panchayat performance-based ranking using IT Tools.
 - d) Use of Panchayats lands for various Government industrial or commercial projects with mutual agreement.
 - e) Bring about more transparency in auction of panchayat land, village pond for fishing to give boost to income of panchayat.
 - f) In-situ village re-development plans.
 - g) Empowering Panchayats for various regulatory activities (e.g.in Haryana., as per section 25 of Haryana Panchayat Raj Act 1994).
 - h) Access to primary and secondary healthcare services in vicinity supported by technology and improved infrastructure.

9.2 Village level

- (i) As villages are directly affected because of quarrying sites, the kind of changes occurring in this zones need to be identified. In Quarrying areas, instead of single village approach, a cluster of villages may be looked at. After the cluster is identified, a hierarchy of facilities related to health, education, transportation etc. to be provided, may be identified accordingly. In addition to this, the activities related to quarrying need to be identified. e.g, in case of stone quarry there can be intermediate processing process, storage, sale system etc.
- (ii) Dissemination of relevant information on regular basis on on-going programs, sources of micro-credit, market potentials, etc. is required. Thus, new businesses be promoted in the rural clusters.
- (iii) Gram sachiv be allocated reasonable number of villages based on terrain, area and population, for improvised monitoring. which s/he can visit in a week time. Gram Sachiv shall submit monthly progress report regarding the status of implementation of the programmes, projects including schemes to BDO on the status of programmes implementation.
- (iv) Large villages may be provided with low cost sewage treatment facilities with appropriate sewerage system. Other rural settlements should be provided with low cost sanitation measures such as sanitary latrines, septic tanks and soak pits.
- (v) Conventional STP/ ETP (activated sludge process) and Bio-filtration technology which generates waste into resources should be adopted.
- (vi) All villages in NCR to strive towards being the 'Adarsh Grams' and benefit from schemes such as PMAGY &SAGY, etc.
- (vii) In addition, NCR villages may move towards being
 - a) Digital Village (Village having facilities like Free Limited Internet Access, Interactive Educational Tools, Medical Services makes it a digital village).
 - b) Cashless Village (All Adults having Bank Account, SMS-based Banking, Swipe Machine for Cashless Transactions & Digital Transactions).
- (viii) Segregation of plastic waste and further usage of it in construction of rural roads may be explored.



B. Suggested Rural Development Policies that could be detailed out at sub-regional and lower-level plans

1. Various schemes related to rural development which need to be dovetailed in the above Participating State Governments may identify 2 or 3 Tehsil towns/ Big (Bazaar) Villages for development in their respective sub-region and also prepare Development Plans and formulate projects on pilot basis. Adhoc programme implementation be changed to planned implementation. Gram Pradhan (elected representative) to have an active role to play in preparation as well as implementation of the Village Development Plan.
2. DDP and VDPs to be developed on the basis of PRA techniques mandatorily, with village land use indicating both existing and planned, being integral part of Village Development Plan along with other details of districts and envisaged development proposals. Programs should be prepared keeping in view the objective that migration from villages to neighbouring towns & industrial areas should be minimized to the extent possible.
3. Cluster of villages may be identified for planned development by provisioning economic, social and physical infrastructure on line of “Rurban Cluster” as envisaged in the NRuM under SPMRM. Sub-regional plans may identify such Rurban Clusters in the respective Sub-regions for planned development of rural settlements.
4. The transitional areas where transition is taking place from Rural to Urban in NCR need to be identified. Growth dynamics of transitional areas need to be looked into, at micro level. Districts may identify how and why the changes are occurring, the outcome of this transition. Approach for rural area should be different than the approach for the transitional area. These, along with the other aspects, should be considered while proposing land use in the respective lower hierarchy plans.
5. Rural Urbanism (Rurban) to attract people & investments should have following aspects:
 - i. Spirit of Villages:
 - a. Community institutions (SHGs, Producer Groups)
 - b. Participatory governance & planning (Gram Sabha, GPDP, Social Audit)
 - c. Livelihoods based on local resource/culture/tourism
 - d. Focus on Natural Resources
 - ii. Facilities of Cities
 - a. Access to Basic Services ‘Ease of Living’
 - b. Choice of Economic Opportunities, Skill Upgradation, Access to Markets & Growth
 - c. Leveraging ICT & Geographic Information System (GIS)
 - d. Land-use regulations and service benchmarks
6. Necessary steps be taken in the direction of environmental conservation and Community preservation, Further, efforts be made at the ground level to support betterment of the non-farm sector - services to agriculture (including input supply, marketing, transport, finance, agricultural processing), rural manufacturing, mining, and other rural services.
7. For populations moving in to Urban areas, following three verticals are required to planned at district or city level:
 - i. Infrastructure and Access to Services.
 - ii. Social Development and Protection – For need of migrants from rural areas, there is a need for Migration Support/ Facility Centers (MFC). This needs to be planned in each of the satellite centers of Delhi on priority and followed by district headquarters and then all urban areas and. These MFC could provide
 - a. Skilling: Counselling at Source and Training at Destination



- b. Could provide information on work options as per the Urban Pull
- c. Legal assistance, Social Security Linkages
- iii. Livelihood Opportunities –migration support centers and development authorities should connect with each other and become a repository for information related to possible opportunities for livelihood.
- 8. All NCR districts to have the District Planning Committees (DPCs) in place as also mandated under Article 243 ZD of the Constitution of India. The District Planning Committees (DPCs) are required to consolidate the plans prepared by the panchayats and municipalities in the district and to prepare the draft development plan for the entire district.
- 9. To address the aspect of people moving from rural to urban or vis a versa, as was observed during the 2019-20 lockdown period, both intra NCR and from or to outside NCR, each district to maintain the information with reasons and take necessary action as beneficial to the population at large. A licensing or pass facility for a person moving into urban areas could also be explored³².

³² suggested by Ministry of Rural Development in workshop



Annexure P-9.2

List of Central Sector and Centrally Sponsored Schemes for possible Convergence for Rural Development

Table P-9.2.1: List of Central Sector and Centrally Sponsored Schemes for possible Convergence for Rural Development

S. No.	Desirable components	Desirable Outcome	Potential Scheme for convergence	
			Name	Brief
1	Skill Development training Linked to Economic Activities	At-least 70 percent Household with one beneficiaries in each households.	Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)	Deendayal Upadhaya Gramin Kaushalya Yojana is scheme implemented by Ministry of Rural Development. The key features of the scheme are: 1) Outcome led design 2) Guaranteed Placement for at least 75% trained candidates 3) Shift in emphasis from training to career progression 4) Post placement support, migration support and alumni network to enable farm to factory transition. 5) Industrial Internships 6) Skill training programs that are based on national and international market demand 7) Special Regional focus - Sub-schemes for J&K (Himayat) and for 27 most affected Left Wing Extremist (LWE) districts (Roshini) across nine States.
2	Agri services and Processing	Support to the Agriculture and Allied Activity components as per RKVY.	Rashtriya Krishi Vikas Yojna (RKVY)	Rashtriya Krishi Vikas Yojna (RKVY) by the Department of Agriculture, Cooperation and Farmer Welfare under the Ministry of Agriculture and Farmer Welfare intends to incentivize the States so as to increase public investment in Agriculture and allied sectors. The scheme gives autonomy to the States to draw up plans for executing Agriculture and allied sector schemes taking into consideration the agro-climatic conditions, availability of technology, natural resources and cropping patterns in the respective districts. The components for which the scheme provides support includes Crop Husbandry (including Horticulture), Animal Husbandry and Fisheries, Dairy Development, Agricultural Research and Education, Forestry and Wildlife, Plantation and Agriculture Marketing, Food Storage and Warehousing, Soil and Water Conservation, Agricultural Financial Institutions, other Agricultural Programs and Cooperation and expenditures directly related to the development of agriculture viz., expenditure on shallow tube well, deep tube well, drip irrigation, sprinkler irrigation, dug wells or other similar irrigation activities which are budgeted under the Agriculture Department of the State.
	(ii) Agri services and farm productivity	Support to components under end to end irrigation supply chain as per PMKSY.	Pradhan Mantri Krishi Sinchai Yojna (PMKSY)	Pradhan Mantri Krishi Sinchai Yojna (PMKSY) by the Department of Agriculture and Cooperation and Farmer Welfare under the Ministry of Agriculture and Farmer Welfare intends to ensure access to protective irrigation to all agricultural farms in the country to produce 'per drop more crop', thus bringing much desired rural prosperity. PMKSY will be focusing on end-to end solution in irrigation supply chain, viz. water sources, distribution network, efficient farm level applications, extension services on new technologies & information etc.
	(iii) Agri Services	Support to organic farming cluster identified under PKVY.	Paramparagat Krishi Vikas Yojana (PKVY)	Paramparagat Krishi Vikas Yojana (PKVY) support and promote organic farming thereby improving soil health. Under PKVY Organic farming is promoted through adoption of organic village by cluster approach and Participatory Guarantee System (PGS) certification. In three years 10,000 cluster covering 5.0 lakh acre organic farming areas is to be developed under PKVY by providing Rs. 20,000/- per acre per farmer for seeds and transport facilities.
3	Digital Literacy (access to digital resources for all citizens)	At-least one e-literate person in every household.	Digital India	Ensuring Universal digital literacy is one of the component under Digital India mission, which intend to provide the citizens the ability to fully exploit the digital technologies to empower themselves. It helps them seek better livelihood opportunities and become economically secure. The programme focuses on digital literacy by ensuring at least one e-literate



Annexure P-9.3

Deficiency Analysis and Identification of Needs for a Rurban Cluster

Table P-9.3.1: Deficiency Analysis and Identification of Needs for a Rurban Cluster

Desirable Component		Existing Situation	Desired Levels	Gaps/Need
1	Skill Development training Linked to Economic Activities	Existing skills in the villages. (Handicraft/Handloom/ Industrial etc) No of skilled members at the HH level.	At-least 70 percent household with one beneficiary in each household.	Identification of training needs in terms of sector and no of people to be trained with age profiling.
2	Agri-services and Processing	Detail the existing Agri services and processing industries present in the cluster. (Including storage infrastructure).		Identification of support to any agri based service/industry/ storage infrastructure.
3	Digital Literacy	Detail the existing levels in terms of core IT infrastructure as well as general digital literacy levels at the HH and Village level.	At least one e-literate person in every household.	Identification of no of people to be digitally literate in the cluster.
4	24x7 Piped Water Supply	Existing levels of water supply at the household level.	70 liters per capita per day (lpcd) of safe drinking water for every households throughout the year.	Identification of Augmentation needs at the household level and type of augmentation- source/ transmission/distribution.
5	Sanitation	Coverage of Individual Toilets in the villages at the household level.	100% HH with Individual Household Latrines.	Identification of no of households to be covered with individual latrines.
6	Solid and Liquid Waste Management	Existing arrangement for solid and liquid waste management at the Household/ Village and Cluster level.	Collection at HH level Treatment at Cluster Level.	Identification of SWM facilities at collection/ transportation/ treatment.
7	Access to Village Streets with Drains	Existing coverage of village streets and drains.	All village streets to be covered with drains.	Identification of length of streets yet to be covered with drains.
8	Village Street Lights	Coverage of village streets with lights.	All village streets to be covered with street lights as per norms.	Identification of no of street lights to be provided.
9	Health	Access to clinics and health centres at the household and village level.	Access to Health infrastructure as per norms.	Identification of need for Mobile Health Units.
10	Up gradation of primary, secondary and higher secondary schools	Existing nos of primary, secondary and higher secondary schools in the cluster and existing conditions.	Ensuring primary and secondary school within a reasonable distance from all households along with facilities of Drinking water provisions, Toilet blocks (separate for boys and girls) and adequate class rooms.	Identification of upgradation needs/ new facilities in the primary and secondary schools.
11	Inter village roads connectivity	Connectivity between villages within the cluster with roads and public transport	Ensure connectivity between all villages.	Identification of need for new connectivity between villages.
12	Citizen Service Centres	Existing no. of citizen service centres at the village level.	One ICT enabled front end Common Service Centre (CSC) per 2 to 3 villages.	Identification of no of CSCs required for the cluster.
13	Public transport	Existing levels of availability w.r.t. Public Transport facilities both intra and inter village.	Public transport to block from each village.	Need for additional facilities to improve public transport access to each village.
14	LPG Gas Connections	Access to LPG connections at the household level.	One LPG retail outlet per village or per 1800 households.	Need for additional retail outlets in the cluster.

Source: Shyama Prasad Mukherji Rurban Mission: INTEGRATED CLUSTER ACTION PLAN (ICAP)



Annexure P-10.1

CHAPTER-10. FUTURE READY CITIZEN INFRASTRUCTURE**Suggested Policies for SAFETY AND SECURITY which could be detailed out in SRPs and other Local level plans District and Local level policies**

1. The policy recommendations and proposals should be aligned with the International and National initiatives, emerging global best practices and knowledge base; framework and guidelines pertaining to public safety, security and disaster management. The international initiatives regarding disaster management as mentioned above includes agreements i.e. Sendai Framework for Disaster Risk Reduction – 2015, Sustainable Development Goals 2015-30 and Paris Agreement on Climate change at the 21st COP under UNFCCC on Climate Change-2015. The national initiatives refer to the National Disaster Management Plan (NDMP) which provides a framework and direction to the government agencies for all phases of disaster management cycle.
2. For Data Security, suggestions of Cyber security Centre of Excellence (CCoE) need to be adhered i.e. Collaborations and sharing of knowledge, best practices, networking, further extensive research and development for Data security with other Industry bodies, incubators, accelerators and cohesive facilitators; and encouragement of a cyber security system so as to minimize risk of cyber-attacks, through a strong network/ partnership between Govt-Industry-Academia-Subject Matter Experts. The purpose of partnership is to keep pace with Technology evolution, adoption of Technology by Consumers and Businesses and Risks and Cyber threats.
3. Increase collaboration among various public safety and security agencies to provide integrated response for any incident.
4. Policy guidelines for the Early, Mid and Long-term Recovery Policies aimed to improve road engineering, install technology based traffic regulatory system, promote lane driving campaign, provide for well-equipped ambulances and trauma centres, develop cycle tracks throughout NCR, spread car pool lanes to encourage car-pooling for improvement of traffic system and security should be detailed out in the Sub-Regional Plans. Transportation Policy for the zone should be developed for reduction of response time for Ambulance, Fire Engines during emergencies. Similarly, disaster response plans should be prepared for buildings such as schools, hospitals, dormitories, etc.
5. Strengthening of Disaster Risk Governance and Capacity Development: Institutional structure/ Framework so as to facilitate implementation of plans, proposals and schemes should be strengthened. Capacity Development for Preparedness and Hazard-wise Responsibility Matrices for Disaster Risk Mitigation is imperative for implementation of the resilience plan. Training and awareness generation for Preparedness for various stakeholders need to be given. Policy for Inter-Agency and inter-district Coordination should be detailed out for plan implementation. For this, constant dialogues amongst the policy makers, operational managers who implement etc. should take place. Bolstering the capacity for disaster management of institutions with authorization concerning planning, decision-making and enforcement, and enabling audits on these issues is also crucial. Empowerment of local authorities, as appropriate, through regulatory and financial mechanism to work and coordinate with civil society, communities and indigenous people and migrants in disaster risk management at the local level should be mandatory to increase community preparedness.
6. Institutional structure/ Framework so as to facilitate implementation of plans, proposals and schemes should be strengthened. Departments/ Agencies dealing with safety and security like Police Departments of NCR states may set up the NCR counter part of Centre for Cybercrime Investigation Training & Research (CCITR). Such Departments/ Agencies may have MoUs with DSCI, Infosys Foundation (the philanthropic arm of Infosys) to have an institutionalized structure for effectively building the capacity and infrastructure for handling the cybercrimes investigations; Possibilities to have 24x7 Security Operations Centre (SOC) to monitor & remediate attack attempts that would handle incident, security audit and certification of all applications, entire security audits carried out for cyber assets need to be explored; NCR Back Office for round the clock operations and represented by state officials to aid Crime investigation that will be a hub of all relevant information for investigation support and maintain liaison with States in NCR and provide relevant information to Investigation Officers (IOs) on demand should be set up.



Annexure P-10.2**Suggested Policies for DISASTER RISK MANAGEMENT which could be detailed out in SRPs and other Local level plans District and Local level policies****1. District level:**

- 1.1 There should be preparedness, planning and capacity development initiatives related to disaster management at district level.
- 1.2 Integrated planning to be done at Block, Urban, Rurban Clusters and Village level
- 1.3 Proper land use planning and Regulation and Enforcement of building codes through Robust Building Permit System are to be ensured at district and local level to reduce impacts of natural disasters.

2. Local Level (urban and rural):

- 2.1 Empowerment of local authorities, as appropriate, through regulatory and financial mechanism to work and coordinate with civil society, communities and indigenous people and migrants in disaster risk management at the local level.
- 2.2 Formulation of Development Control Regulations for Hazard zones
- 2.3 Regarding the manmade disasters, there are certain spatial areas which lead to proliferation of diseases and these needs to be identified. Areas that are affected by toxic ground water need to be identified and planned for, accordingly. At such areas, rain water harvesting or artificial water recharging techniques may be implemented at a much higher pace, so that stronger pollutants are diluted. Areas with high communicable diseases (if any) need to be identified and action may be taken accordingly in order to ensure that it does not get spread spatially.
- 2.4 Areas having industrial hazards need to be planned properly for risk of Fires.
- 2.5 Updated classification of land (example – Degraded Land) need to be mentioned in the plan.
- 2.6 Develop risk assessment models with help of geospatial technologies to understand ground conditions for risk quantification and needs-gaps assessment with regard to residential, commercial, industrial buildings in micro identification of exposure to hazards, vulnerability and risk analyses, capacity assessments and identification of risk mitigation measures.
- 2.7 At least four times in a year in every school disaster management mock drills should take place. This may be included in the plan and the same may be replicated across NCR region.
- 2.8 Response time for Ambulance, Fire Fighting incidence are increasing day by day. Hence, there is need to develop transportation policy for the entire zones in this regard. The peri urban areas also need to be taken into consideration while planning.
- 2.9 Concerned authorities in states need to get a socio-economic study of an area, before giving any recommendations related to fire. Following recommendations also may be looked at:
 - a) Firemen, fire equipment and even fire stations shortage be taken care of , in timely manner.
 - b) A Centralized command and control center room for monitoring purpose, be set up in all States as in Uttar Pradesh. Information related to the hazardous buildings be linked directly to the control room.
 - c) As despite National Building Code in place for hotels, hospitals etc., codes are not being followed, a specific ward wise plan should be in place and monitored regularly.
 - d) At local level, a limit to the total number of footfalls in Malls, Hotels to be looked at.
- 2.10 Major development proposals should be submitted with a Fire Statement.



- a) Enhancing community disaster preparedness, by having maximum residents participate in disaster drills; Raise community's disaster management capabilities to prepare for a major earthquake directly hitting the capital and other disasters; Increase volunteer fire corps members and develop a system for collaboration between fire corps groups. Send disaster management consultants to independent disaster preparedness organizations to provide advice on the neighborhood's challenges; Prepare a disaster preparedness manual and promote fostering of disaster preparedness leaders that considers female perspective too.
- 2.11 Areas for environmental protection - Sub-regional plans/District and master/Development Plans should place defined regions of the city that must be protected for providing important environmental services such as: Biodiversity Preservation; Flood Control; Water Production; Erosion Control& Mitigation of Heat Islands.
- 2.12 Strategies to encourage land use and transportation infrastructure that improve the ability to withstand climate change impacts and natural hazard risks, may be undertaken. The probable actions that may be taken:
 - (i) Incorporate climate change and natural hazard risk assessments into the planning and location of utilities, assets and operations
 - (ii) Work with the concerned agencies and municipalities to:
 - a) consider climate change impacts and natural hazard risks (e.g. earthquake, flooding, erosion, subsidence, interface fires) when extending utilities and transportation infrastructure that encourages land use development;
 - b) research a& promote best practices in adaptation to climate change
 - (iii) Encourage land use, transportation and utility infrastructure which improve ability to withstand climate change impacts and natural hazard risks.
 - (iv) Municipalities to:
 - a) Include policies to encourage settlement patterns that minimize risks associated with climate change & natural hazards (e.g. earthquake, flooding, erosion, etc.).
 - b) Incorporating climate change and natural hazard risk assessments into the planning and location of municipal utilities, assets and operations.
 - (v) Central and State agencies, in collaboration with the other agencies:
 - a) Provide financial assistance and timely data and information, such as flood hazard mapping, hydrological and hydraulic studies, to better enable ULBs to fulfill their flood hazard management roles and responsibilities; Review and improve the effectiveness of existing provincial legislation and guidelines regarding flood hazard management by municipalities.
 - b) Development Plans should use the State/ Regional Flood Risk Appraisal and their Strategic Flood Risk Assessment as well as Surface Water Management Plan, to identify areas where particular flood risk issues exist and develop actions and policy approaches aimed at reducing these risks. Administrative units should jointly address cross-boundary flood risk issues.
 - c) Create a greener energy system with more capacity through scaling up of renewable resources, manage demand with energy-efficient buildings and variable pricing and through electrification of vehicles etc.
 - d) Address flood vulnerability of critical transportation assets.



Annexure P-10.3

Suggested Policies for HEALTH & FITNESS sector which could be detailed out in SRPs and other Local level plans District and Local level policies

1. Two key prerequisites for any initiative towards Health care planning would include, analysis of the deficits in the health infrastructure (both healthcare facilities-primary, secondary, tertiary, as well as the required skilled adequate manpower e.g. Doctors, Nurses, para medical staff etc. to run the same), and then the financial resources to arrange for the required infrastructure.³³ Through assessment of same, States should aim for Good Health Outcomes, Financial Protection, Patient satisfaction and regional competitiveness in Health Systems. Objective should be to make Health Care in NCR region, affordable and accessible to all.
2. States may adopt PPP policy for improvement of health care facilities and standardize healthcare, while maintaining a high quality of services, in turn, raising the life expectancy and mortality rates. States also to ensure required number of Health Care Centres needed including AYUSH and assist in provision of comprehensive healthcare delivery system, under the national flagship program of Pradhan Mantri Arogya Mitra.
3. State health departments may coordinate with Indian Council of Medical Research (ICMR) and develop and help realize the potential of (1) Artificial Intelligence in Healthcare (2) Next-generation digital healthcare systems (3) Engineering healthier environments at workplace (4) Future affordable and inclusive healthcare solutions and (5) Technologies to improve healthcare treatment³⁴.
4. Highly fragmented Service delivery (70-80% from private sector) warrants exploring possibility of combining delivery models with provider consolidation under strategic purchasing. Critical actions to reduce fragmentation in services delivery in NCR may include enabling aggregation of providers to offer people centered care financed through a capitation model; Innovative platform organization models to cluster/aggregate/ support/ manage small providers; and Transformative delivery models.
5. Explore and encourage a system of online payments upfront, before consultations are initiated online and online issuance of signed prescriptions could be in encrypted form.
6. Explore options/ rule amendments to enable the Pharmacy rules to allow prescription of drugs beyond over-the counter drugs except restricted drugs.
7. Most diseases can be prevented through making lifestyle conducive to health. stress and mental health problems due to lifestyle issues need attention as these affect both physical and mental health. Hence, alongside efforts for control and prevention of infectious diseases, programs focusing on essential lifestyle and behaviour changes are also required.
8. Appropriate steps be taken to cover all citizens especially all sections of middle classes who are unserved by Ayushman Bharat and other medical insurance schemes in NCR under appropriate Health Insurance. In this regard participation of the private sector can also be explored.
9. States should develop '**Testing Mechanisms**' and efficient & quality testing systems for common citizen. Ensure awareness for laboratory system for of food/drug adulterants identification/ testing for timely results of collected food samples be encouraged to ensure quality food consumption. Efforts be made to ensure Mobile Testing Labs availability in urban areas as well as remote locations.
10. In-Service training be made essential for medical and paramedical staff. The routine curriculum should include Patients Safety, Hospital Services information, Emergency Medical Response and Disaster management.
11. For hospital designing, a branch/ module on Hospital architecture may be established for hospital designing skill and all Architecture Schools to promote and introduce Hospital design assignments as mandatory. A

³³ Source: Ministry of Health and Family Welfare, National Urban Health Mission

³⁴ Source: Innovation & Translation Research Division, Indian Council of Medical Research, New Delhi



Certificate course on hospital designing could be introduced.

12. **Malnourishment:** Stunting due to malnourishment, is a serious problem in many parts of India and NCR is no exception. NITI Aayog has prepared a detailed report outlining a national Nutrition Strategy. This needs to be implemented effectively in NCR. The NITI Aayoh nutrition strategy can be accessed from the link below:
https://niti.gov.in/writereaddata/files/document_publication/Nutrition_Strategy_Booklet.pdf



Annexure P-10.4

Suggested Policies for SPORTS sector which could be detailed out in SRPs and other Local level plans District and Local level policies**A. DEVELOPMENT AND SUSTAINABILITY OF SPORTS CULTURE**

1. States to promote the concept of '**Sports for All**' in NCR as an integral part of education and development and a potential career pathway. Government's priority on mainstreaming sport as a tool for individual, community, economic and national development through engaging youth, could help change this and thus need to be taken forward.
2. State Sports departments may initiate state level programs on the lines of '**Athlete Career Program**', of International Olympic Committee (IOC) and the International Paralympic Committee (IPC) in conjunction with Indian Olympic Association (IOA), which discusses on how athletes can take up a particular sport and establish themselves in it in future.
3. In past Delhi has hosted multi-sports events like Asian Games (1951 & 1982), Commonwealth Games (2020). Keeping in view the rising stature of NCR, globally, joint efforts have to be made by all NCR participating States to host key multi - sports events like Olympics, Paralympic, Asian Games, Commonwealth Games, etc. in coming decades.
4. Sports institutions should rope in eminent sports personalities as Director or HoDs or positions of importance and benefit from their rich experiences. People behind successful sports persons be also honored and rewarded/ incentivized for success of their pupil, to encourage them produces more champions.
5. Sports should be linked with health and lifestyle aspects, and considered as important. Efforts towards encouragement of healthy lifestyles and active living for all ages, with provisions for healthcare, education, recreation, cultural arts and entertainment opportunities should be promoted.
6. Women and girl participation in sports may be encouraged, through awareness and education. Initiatives like "Raahgiri" campaign should become a regular affair across NCR towns.
7. Sports competitions for children out from the formal education system should be organised. Such '**Open Sports Competitions**' be organised at Block level every six month at least.

B. INFRASTRUCTURE FOR COMPETITIVE & NON-COMPETITIVE SPORTS

8. Issues such as insufficient private sector funding; restrictive guidelines for availing government grants for sports infrastructure (only select government entities are eligible to undertake infrastructure development projects); poor asset utilisation and inefficient monetisation planning leading to suboptimal returns on developed sports infrastructure assets, which deters further investment, may be addressed on priority.
9. Address the issue of shortage of indoor as well as outdoor sports infrastructure, especially, at grassroots level, and improve asset management of existing infrastructure Plan for training facilities for both novice at the grassroots and elite athletes at top level.
10. Multi-storey Sports facilities (indoor & outdoor) with adequate measures be developed in NCR, in order to address the issue of land availability and shortage of sports infrastructure. This will ensure variety of sports facilities at local level in each society/ colony.
11. Educational Institutions to mandatorily have or **co-shared facilities** of play grounds, gymnasiums, swimming pools, etc. They may collaborate amongst themselves through MoUs, etc. to meet the requirements, as per specified standards, to enable efficient usage of available infrastructure. Schools/colleges having large playgrounds be directed to optimally utilise their sports infrastructure, by allowing its use beyond the institution's normal timings.



12. Location of stadiums and other sports avenues be such that sports aspirants from both towns and villages can approach and avail the facilities. It is be ensured that fitness centers are provided at local level like Gram Panchayat and Block headquarters as well. Local authorities may replicate Delhi initiative for open gymnasiums in the parks.

C. **SUPPORT INFRASTRUCTURE FOR SPORTS**

13. Concerned departments may look into providing necessary sports ancillary infrastructure i.e. fitness centers, open gymnasiums in the parks and energy-harvesting outdoor gym³⁵ (at local level like Gram Panchayat and Block headquarters) and related adequate skilled manpower/ staff. These may include right Coaches/ Trainers, Physiotherapist, Physical Therapist, Nutritionists, Dieticians, Medical staff related to sports injuries, Medical Assistant, Sports Medicine Aide, Sports Massage Therapist, Sports and Fitness Nutritionist, Strength and Conditioning Coach, Exercise Physiologist, Sports Physician, Sports Psychologist, Video Analysts etc.
14. Promote executive-level sports management training opportunities for development of trained professionals to manage leagues and major sporting events.
15. Establish **Sports Libraries and Sports Museums**, Traditional Games Park (Olympic, Paralympic, Traditional Games, Martial Arts, etc.) in each district which would encourage the interest of coming generations in sports and promote 'Sports Tourism' in NCR. These may be located within sports facility premise or separately at appropriate location in the city.
16. Sports related Medical/ Rehabilitation Centers for injured players should be set up in each district in NCR.

D. **RESEARCH, INNOVATION, EDUCATION AND TRAINING**

17. Formulate and implement effective policies for Sports Education. Sports Colleges/ Universities (e.g. Sports School Rai in Sonipat District, Haryana) to educate individuals regarding all skills and courses, required for sportsperson be proposed, as per SAI guidelines and state requirements. The existing facilities also be upgraded on priority.
18. Promote courses/ research in sports sciences (including nutrition, psychology, medicine and sports education), in higher education to help enhance performances in sports.
19. **Sports Research Centers and laboratories** be promoted in NCR.
20. Players of international eminence be appointed as State Observers for the development of various sports in the NCR constituent states. Among other responsibilities, they may assess the existing sports infrastructure/ equipment, quality of scientific backup and medical facilities at the venues of the national/ state coaching camps and report the critical gaps.
21. Provide accreditation to school/college on the basis of sports performances and maintenance of health and physical fitness of children. Advocate 15% time of the total school time in physical and sport activities with at least 60-90 minutes for the same.
22. Awareness campaigns to raise awareness on sports benefits be regularly organized.

E. **DESIGN AND PLANNING**

23. **Open Playground** should be mandatorily provided as distinct from parks in all colonies, group housing schemes and in each ward, etc. Play areas be mandatory in all group housings and distinct from greens which shall be part of 10-15% open areas.
24. **Dedicated play fields/areas** in parks and grounds be designated in the Master /Development Plans which would encourage outside play activities of children and youths. Necessary updation /amendments may be made in the Master /Development Plans if such provisions are not available.

³⁵ <https://newatlas.com/tgo-green-heart-electricity-generating-gym/23078/>



25. Necessary amendments in bylaws (FAR, TDR, etc.) be done to encourage existing and proposed townships / society to accommodate/ provide sports facilities (indoor as well as outdoor) as per plot size.
26. Legacy planning be done before the construction of stadia/ complex/ assets beings in order to incorporate future requirements post international events as per the legacy plan into design of assets.
27. In Uttar Pradesh, all playgrounds are registered in revenue records/ provided in Khatauni and their identification and fencing being done. It is suggested that like the State of UP, all playgrounds should be identified and fencing of such area be done to avoid encroachments across NCR.
28. Mapping of Sports facilities including infrastructure and coach facilities, etc. be mandatorily done in all Sub-Regional Plans/ District Development Plans/ Master Plans/ Development Plans, etc.

F. SPORTS ECONOMY

29. Sports sector is growing and generates income and employment. NCR States should recognise sports as an ‘**industry**’³⁶. In addition, all efforts be made to give ‘Sports’ a tag of organised sector, through working out and providing it with clear guidelines say, for working /running Sports Academies, to boost investor confidence, in the sector.
30. The changing outlook towards fitness is fuelling the increase in demand for sports-related goods and services.
31. NCR States should formulate policies/ guidelines for coordination between existing sports infrastructure & educational institutes and promoting Sports Education, by 2022.

G. DEVELOPMENT AND SUSTAINABILITY OF SPORTS CULTURE

32. Sports should be mandatory like other course subject in school with proper physical education and sports training integrated in the curriculum. Educational institutions should assign weekly durations for sports activities, both indoor as well as outdoors.

H. INFRASTRUCTURE FOR COMPETITIVE & NON-COMPETITIVE SPORTS

33. District administrations may look for properties at different level (Tehsil/ block/ /school) which can be utilised for sports activities at nominal / affordable charges.
34. Explore possibilities of increasing and attracting investment in high-performance sport infrastructure and have world-class facilities in NCR where players can be trained for international level competitions.

I. SUPPORT INFRASTRUCTURE FOR SPORTS

35. Concerns regarding inadequate staffing for running the facilities and supporting the sports aspirants also needs to be adequately addressed.
36. Facilities for related skill development to meet the international standards and related institutes be established in NCR with professionally trained support staff to improve the quality of training for aspiring athletes and other sportspersons
37. Promote high performance training centers and coaching centers with facilities enabling players to have a proper health & fitness Program for respective sport.

J. RESEARCH, INNOVATION, EDUCATION AND TRAINING

38. For Financial Support School / College may dedicate 15% amount of the fees / income on sports and provide kit & equipment, diet, etc.
39. State departments should collaborate with SAI and Sports Federations to train coaches, to meet international standards.

³⁶ State of Mizoram has accorded ‘industry’ status to sports.



K. DESIGN AND PLANNING

40. Housing societies of Delhi and various towns of NCR to mandatorily have adequate area for sports/ fitness within the society for kids. Any kind of sports be it swimming, bicycling, badminton court, squash court, basketball court, etc. should be developed to promote the sports culture in kids.

L. INSTITUTIONAL FRAMEWORK

41. State departments and district authorities to periodically evaluate available/needed sports infrastructure, to make gap assessments and take action accordingly.
42. Better Coordination is required amongst Educational, Health and Sports departments. Physical training teachers should work in coordination with coaches and nutritionists.
43. City administrations may enter into agreements with Sports Federations to manage the sports infrastructure created and proposed to be created. Accountability be set in sports federations to enhance their effectiveness in supporting the athletes/ sportspersons being produced.



Annexure P-10.5

Suggested Policies for EDUCATION sector which could be detailed out in SRPs and other Local level plans District and Local level policies

1. Reputed well performing schools/ educational institutions located in cities like Delhi and CNCR towns, be encouraged to set up their branches in areas beyond CNCR and CMAs. The low performing institutions can also be adopted for capacity building and quality improvement.
2. **Spatial imbalances** in school, college and university education infrastructure should be evened out by making provisions to allot land for development of the same in the educationally deficient sub-Regions of the NCR.
3. There should be combined orientation and sensitization of educational function and monitoring of implementation of educational programmes and schemes in the NCR districts. Data related to the districts should be available to the educational planners of the NCR districts.
4. Well performing educational institutions especially located in Delhi, should either branch out in the adjoining NCR districts or adopt low performing institutions, for capacity building and quality improvement. Suitable land provision for the same should be made.
5. States may explore possibility regarding introduction of '**School District Concept**' and '**Creation of Campus Towns**'. A school district can be an area including all schools that are situated within that area and are governed by a particular authority. Institutional hubs can be created and allowed sharing of infrastructure like grounds and laboratories and other equipment, amongst institutions and benefit the student community.
6. Schemes be prepared by the NCR States by 2023 to improve female literacy rates in NCR districts, especially in districts having the lowest female literacy rates in NCR.
7. **Gross Enrolment Ratio (GER)** related targets be specified in each sub-regional plan for each district with phasing. Specific Scheme in this regard should also be prepared by 2023.
8. Schemes be prepared by NCR states to ensure the Open and online learning.
9. All NCR Sub-regions should prepare scheme by 2023 for creation of Institutional hubs and allowing sharing of infrastructure like grounds and laboratories and other equipment, amongst institutes.
10. The educational opportunities in universities, colleges and other educational institutions (technical and professional education) should be made accessible, by making special provision for the people residing in the NCR.
11. Develop and implement land use and infrastructure plans for education districts that create the conditions for the continued co-location of education and skill development facilities and services, to support the district and its growth, have high levels of accessibility, attract associated businesses, industries and commercialization of research and also facilitate housing opportunities for students and workers within reasonable time from settlements.
12. For **High-grade educational facilities**, world-class universities and institutions of higher education should be encouraged to be set up, at least one in every major town of the NCR so as to ensure spatial balance and access to facilities. Connectivity to all education and skilling institutions through public transport system should be improved and facilities be created so as to enable reduction in travel distances.
13. A **NCR Center for Student Assessment (NCSA)** should be created as a state of the art centre to provide thought leadership and technical support to central and state governments. NCSA shall specialize in all aspects of large scale and school assessments. Also, a **NCR Center for Education Technology (NCET)** as a dedicated centre for planning and executing a long-term vision to leverage computer and information technology for improving learning outcomes should be created in the NCR. The NCET can provide thought leadership, research and technical support to central government and state governments on large scale educational technology implementation as that would be the future of education delivery.



Annexure P-10.6**Suggested Policies for SOCIAL SUPPORT SYSTEM-CARING NCR which could be detailed out in SRPs and other Local level plans District and Local level policies****A. CARING NCR**

1. Public transport availability be planned for older people to reach key destinations - hospitals, health centres, public parks, shopping centres, banks and seniors' centres with all such areas being well-serviced with adequate, well-connected transport routes.
2. Necessary arrangements be made to address isolation issues and foster community integration through social, cultural & religious activities. 'Elderly Clubs' can be formed at local level.
3. Campaigns be organized for increasing awareness about, 'Women and Child helplines'. The effectiveness of such help lines be improved.
4. Adequate Care Centres be planned for physically / mentally challenged persons. All public places like roads, workplaces, shopping centres/markets, healthcare institutions, recreation facilities, walkways, etc., should have disabled friendly design features in NCR.

B. AGED AND ELDERLY

5. Envisage elderly friendly habitations for future and accordingly plan for required quality Old Age Homes/ Care centres. Activities and events be well-communicated, including information about the activity, its accessibility and transportation options.

C. OUTDOOR SPACES, BUILDINGS, TRANSPORT & OTHER SUPPORT FACILITIES

6. The persons receiving unemployment allowance be simultaneously provided skill training to make them employable.
7. NCR states to work jointly on having a platform for vacancy analysis that may include an information system where in all vacancies and available skilled manpower with locations, are monitored and coordinated with employment exchanges for filling up vacancies. Job-Portal in line with NCT Delhi be created in for all sub-regions.

D. INSTITUTIONAL ARRANGEMENT

8. NCR states may empanel/enlist various reputed NGOs, Self Help Groups (SHGs), etc. which could be taken as Knowledge partners by Authorities/ Corporations/ ULBs. Further, in order to make NCR socially supportive to old, women, child and people with special needs, such knowledge partners can contribute significantly during planning & development process, advice in customization/changes in the existing infrastructures & facilities. They can also train human resource on social issues, challenges and help in running few facilities, showcasing it as Model Facilities for other cities and areas to replicate.
9. States/ULBs to plan for providing public spaces and amenities for increased social interaction/ community engagement, sharing space by co-locating schools with other public services, such as health clinics, senior citizen centers, senior housing, Child & Day care centers, after-school programs, etc. Co-location can offer cost savings, community integration, and inter-generational support.



Annexure-P-10.7

SDG wise Key Targets for NCR-2030

Table P-10.7.1: SDG wise Key Targets for NCR-2030

Goal 1: End poverty in all its forms everywhere

Indicators	Target		Justification of Target & NCR States Status as on 2020-21
	National (by NITI)	NCR (by NCRPB)	
Percentage of population living below the national poverty line	10.96	5.48	Global SDG target 1.2 aims to reduce at least by half proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions. According to Tendulkar Committee estimates, poverty rates in India stand at 21.92 percent. Therefore, half of this value has been taken as the national target by NITI Aayog which is further reduced to its half for NCR, being one of the most developed urban regions of the country. India- 21.92%, Delhi – 9.91%, Haryana – 11.16%, Rajasthan – 14.71% and U.P. – 29.43%, as per SDG India Index 2020-21.
Head count ratio as per the Multi-dimensional Poverty Index (%)	13.95	6.97	According to OPHI's Global MPI Country Briefing 2020 Report on India based on NFHS-4, the incidence of multidimensional poverty in India was 27.9 percent. Therefore, half of this value has been taken as the national target which is further reduced to its half in case of NCR. India- 27.90%, Delhi – 4.30%, Haryana – 10.90%, Rajasthan – 32.00% and U.P. – 40.80%, as per SDG India Index 2020-21.
% of households with any usual member covered by a health scheme or health insurance	100	100	This target corresponds to the global SDG target 1.3 which aims to implement nationally appropriate social protection systems and measures for all. Worldwide, the provision of some form of universal health coverage is regarded as a basic component of social security. India- 28.70%, Delhi – 15.70%, Haryana – 12.20%, Rajasthan – 18.70% and U.P. – 6.10%, as per SDG India Index 2020-21.
Persons provided employment as a percentage of persons who demanded employment under Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)	98.95	81.83	Mandate of the MGNREG Act is to provide at least 100 days of guaranteed wage employment in a financial year to every rural household whose adult members volunteer to do unskilled work at the time and place provided by a Program Officer. Taking into consideration possible attrition in the labour turn out due to reasons such as ill health, availability of alternate employment, climatic factors etc., the national target has been fixed to be the average of the 3 best performing States. In case of NCR the target has been fixed based on the average of NCR States i.e. Haryana (79.12), Rajasthan (84.24) and U.P.(82.15). It is also considerable that NCR being an economic activities hub, dependency/demand for employment under MGNREGA will reduce. India- 84.44%, Delhi – Null, Haryana – 79.12%, Rajasthan – 84.24% and U.P. – 82.15%, as per SDG India Index 2020-21.
Percentage of the population (out of total eligible population) receiving social protection benefits under Pradhan Mantri Matru Vandana Yojana (PMMVY)	100	100	PMMVY is a maternity benefit programme implemented in all districts of the country since 2017 for the welfare of pregnant women and lactating mothers. It is aimed that all persons belonging to the eligible population under PMMVY benefit from the programme. India- 91.38%, Delhi – 96.5%, Haryana – 97.24%, Rajasthan – 98.15% and U.P. – 93.48%, as per SDG India Index 2020-21
Percentage of households living in katcha houses	0	0	Global SDG target 1.4 aims to ensure that by 2030, all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property. Therefore, the target has been set to 0 percent implying that no household should reside in a katcha house which is a non-durable and temporary form of housing. India- 4.20%, Delhi – 0.80%, Haryana – 0.20%, Rajasthan – 2.80% and U.P. – 6.40%, as per SDG India Index 2020-21.



Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Percentage of beneficiaries covered under National Food Security Act (NFSA), 2013	100	100	NFSA, 2013 is a Government of India Act that aims to provide for food and nutritional security by ensuring access to adequate quantity of quality food at affordable prices. It is aimed that all persons belonging to the eligible population under NFSA, 2013, benefit from the Act. India- 99.51%, Delhi – 100%, Haryana - 99.92%, Rajasthan – 100% and U.P. – 99.23%, as per SDG India Index 2020-21.
Percentage of children under five years who are underweight	1.9	1.0	The national target has been set to 1.9 percent as this the corresponding percentage of children under five years who are underweight in upper middle-income countries as per the 2019 database of the World Bank. Considering wide spread of health and child care facilities in NCR districts, the target for NCR is set as 1.0 envisaging more improvement in comparison to national target. India – 33.4%, Delhi – 28.1%, Haryana – 28.8%, Rajasthan – 31.5% and U.P. – 36.8%, as per SDG India Index 2020-21.
Percentage of children under five years who are stunted	6.0	6.0	The target has been set to 6 percent as this is the corresponding prevalence of stunting in upper middle-income countries as per the 2019 database of the World Bank. India – 34.7%, Delhi – 28.8%, Haryana – 34.9%, Rajasthan – 36.8% and U.P. – 38.8%, as per SDG India Index 2020-21.
Percentage of pregnant women aged 15-49 years who are anaemic	25.2	20	The WHO targets a 50 percent reduction of anaemia in women of reproductive age by 2025 (Global Nutrition Targets 2025, Policy Brief Series). Hence, 50 percent reduction from base year (2015-16) has been set to be the national target, and further envisaging slight improvement in NCR. India – 50.4%, Delhi – 46.1%, Haryana – 55.0%, Rajasthan – 46.6% and U.P. – 51.0%, as per SDG India Index 2020-21.
Percentage of adolescents aged 10-19 years who are anaemic	14.2	10	The WHO targets a 50 percent reduction of anaemia in women of reproductive age by 2025 (Global Nutrition Targets 2025, Policy Brief Series). In the absence of a definite national or global target on reduction of anaemia in adolescents, 50 percent reduction from base year (2015-16) has been set to be the national target, further envisaging slight improvement in NCR. India – 28.4%, Delhi – 29.2%, Haryana – 29.9%, Rajasthan – 26.0% and U.P. – 31.6%, as per SDG India Index 2020-21.
Rice and wheat produced annually per unit area (Kg/ Ha)	5322.08	As per States target. However, in NCR water intensive crops to be replaced with less-water consuming crops.	Global SDG target 2.3 aims to double the agricultural productivity by 2030. Hence, target is to double the agricultural productivity from the base year (2015-16). India – 2995.21, Delhi – 3977.23, Haryana – 4272.42, Rajasthan – 3423.23 and U.P. – 3158.46, as per SDG India Index 2020-21.
Gross Value Added (constant prices) in agriculture per worker (in Lakhs/ worker)	1.22	2	Global SDG target 2.3 aims to double the agricultural productivity and incomes of small-scale food producers. Therefore, the national target has been set to double the GVA added in agriculture per worker from the base year (2015-16) figures. For NCR is target of 04 has been set based on existing figures of Delhi and Haryana. India – 0.71, Delhi – 2.67, Haryana – 1.99, Rajasthan – 0.86 and U.P. – 0.59, as per SDG India Index 2020-21.



Goal 3: Ensure healthy lives and promote well-being for all at all ages

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Maternal Mortality Ratio (per 1,00,000 live births)	70	40	Global SDG target 3.1 aims to reduce maternal mortality ratio to less than 70 per 1,00,000 live births by 2030. India-113, Delhi- Null, Haryana-91, Rajasthan-164 and U.P.-197, as per SDG India Index 2020-21.
Under 5 mortality rate (per 1,000 live births)	25	10	Global SDG target 3.2 aims to reduce the under-5 mortality rate to at least 25 per 1,000 live births by 2030. India-36, Delhi-19, Haryana-36, Rajasthan-40 and U.P.-47, as per SDG India Index 2020-21.
Percentage of children in the age group 9-11 months fully immunized	100	100	This target corresponds to the global SDG target 3.2 which aims to end preventable deaths of newborns and children under 5 years of age. 100 percent immunization coverage (BCG, measles, and 3 doses each of polio and DPT) is a prerequisite to achieve this global target. India-91, Delhi-92, Haryana-87, Rajasthan-69 and U.P.-95, as per SDG India Index 2020-21.
Total case notification rate of Tuberculosis per 1,00,000 population	242	500	This target corresponds to the global SDG Target 3.3 that aims to end the epidemic of tuberculosis by 2030. Notification of cases of infectious diseases is a critical step in controlling and preventing the spread of communicable diseases. The national target has been fixed to be the average of the 3 best performing States. The NCR target is fixed based on figures of Delhi India-177, Delhi-575, Haryana-255, Rajasthan-223 and U.P.-213, as per SDG India Index 2020-21.
HIV incidence per 1,000 uninfected population	0	0	The target is aligned with the global SDG target 3.3 that aims to end the epidemic of AIDS by 2030. India-0.05, Delhi-0.15, Haryana-0.09, Rajasthan-0.04 and U.P.-0.03, as per SDG India Index 2020-21.
Suicide rate (per 1,00,000 population)	3.5	3.5	Global SDG target 3.4 aims to reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being, by 2030. Hence, the target has been set to reduce by a third from the base year (2015) figures. India-10.4, Delhi-12.7, Haryana-14.5, Rajasthan-5.8 and U.P.-2.4, as per SDG India Index 2020-21.
Death rate due to road traffic accidents (per 1,00,000 population)	5.81	5 “Zero Road Accident Death NCR”	Global SDG target 3.6 aims to halve the number of global deaths and injuries from road traffic accidents. (Base year 2015) India-11.56, Delhi-7.56, Haryana-18.29, Rajasthan-13.61 and U.P.-10.30, as per SDG India Index 2020-21.
Percentage of institutional deliveries out of the total deliveries reported	100	100	This target corresponds to the global SDG target 3.7 which aims to ensure universal access to reproductive health-care services by 2030. India-94.40, Delhi-96, Haryana-95.7, Rajasthan-98.2 and U.P.-87.6, as per SDG India Index 2020-21.
Monthly per capita out-of-pocket expenditure on health as a share of Monthly Per capita Consumption Expenditure (MPCE)	7.83	5.5	This target corresponds to the global SDG target 3.8 which aims to achieve universal health coverage, including financial risk protection and access to affordable essential medicines and vaccines for all. The target has been fixed to be the average of the 3 best performing States. India-13.00, Delhi-9.20, Haryana-10.40, Rajasthan-11.80 and U.P.-16.60, as per SDG India Index 2020-21.



Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Total physicians, nurses and midwives per 10,000 population	45	50	Global SDG target 3.c aims to substantially increase health financing and the recruitment, development, training and retention of the health workforce. The WHO, in its report “Monitoring Health in the Sustainable Development Goals: 2017, World Health Organization, Regional Office for South East Asia”, lays out a national target to have a skilled health professionals density (physicians/nurses/midwives per 10,000 population) of 44.5. For NCR it should be at par with NCT Delhi India-37, Delhi-50, Haryana-26, Rajasthan-49 and U.P.-14, as per SDG India Index 2020-21.

Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Adjusted Net Enrolment Ratio (ANER) in elementary education (class 1-8)	100	100	This target corresponds to the global SDG target 4.1 which aims to ensure that all girls and boys complete free, equitable and quality primary and secondary education. The National Education Policy 2020 also aims to ensure universal access and afford opportunity to all children of the country to obtain quality holistic education-including vocational education - from pre-school to Grade 12. India-87.26, Delhi-100, Haryana-89.31, Rajasthan-83.29 and U.P.-84.54, as per SDG India Index 2020-21.
Average annual dropout rate at secondary level (class 9-10)	8.8	8.8	This target corresponds to the global SDG target 4.1 which aims to ensure that all girls and boys complete free, equitable and quality primary and secondary education. The National Education Policy, 2020 also aims to curtail drop-out rates with a goal to achieve 100 percent Gross Enrolment Ratio in preschool to secondary level by 2030. Average of the 3 best performing States has been set as the target. India-17.87, Delhi-14.93, Haryana-14.79, Rajasthan-12.69 and U.P.-15.51, as per SDG India Index 2020-21.
Gross Enrolment Ratio (GER) in higher secondary (class 11-12)	100	100	The National Education Policy, 2020 aims to ensure that all students have universal, free and compulsory access to high-quality and equitable schooling from early childhood care and education (age 3 onwards) through higher secondary education (i.e., until class 12). India-50.14, Delhi-70.07, Haryana-56.05, Rajasthan-56.51 and U.P.-46.12, as per SDG India Index 2020-21.
Percentage of students in class 8 achieving atleast a minimum proficiency level in terms of nationally defined learning outcomes to be attained by the pupils at the end of the grade	100	100	This target corresponds to the global SDG target 4.1 which aims to ensure that all girls and boys complete free, equitable and quality primary and secondary education with relevant and effective learning outcomes. India-71.9, Delhi-67.4, Haryana-71.6, Rajasthan-88.1 and U.P.-67.4, as per SDG India Index 2020-21.
Gross Enrolment Ratio (GER) in higher education (18-23 years)	50	50	The National Education Policy, 2020 aims for GER in higher education to reach 50 percent by 2035. India-26.3, Delhi-46.3, Haryana-29.2, Rajasthan-23 and U.P.-25.8, as per SDG India Index 2020-21.
Percentage of persons with disability 15 years and above who have completed at least secondary education	100	100	This target corresponds to global SDG target 4.5 which aims to ensure equal access to all levels of education for the vulnerable, including persons with disabilities by 2030. India-19.3, Delhi-41, Haryana-25.1, Rajasthan-14.9 and U.P.-17.8, as per SDG India Index 2020-21.



Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Gender Parity Index (GPI) for higher education (18-23 years)	1	TBD	This target is aligned with the global SDG target 4.5 which aims to eliminate gender disparities in education. India-1, Delhi-1.16, Haryana-1.23, Rajasthan-1.00 and U.P.-1.14, as per SDG India Index 2020-21.
Percentage of persons 15 years and above who are literate	100	100	This target is aligned with the global SDG target 4.6 that aims to ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy, by 2030. India-74.6, Delhi-86.40, Haryana-77.30, Rajasthan-67.10 and U.P.-68.20, as per SDG India Index 2020-21.
Percentage of schools with access to basic infrastructure (electricity, drinking water)	100	100	The National Education Policy 2020 aims to provide effective and sufficient infrastructure so that all students have access to safe and engaging school education at all levels from pre-primary school to Grade 12. It aims to take special care to ensure that no school remains deficient on infrastructure support. India-84.76, Delhi-100, Haryana-98.82, Rajasthan-83.23 and U.P.-81.48, as per SDG India Index 2020-21.
Percentage of trained teachers at secondary level (class 9-10)	100	100	This target is aligned with global SDG target 4.c which aims to substantially increase the supply of qualified teachers. India-82.62, Delhi-89.33, Haryana-89.10, Rajasthan-92.23 and U.P.-73.86, as per SDG India Index 2020-21.
Pupil Teacher Ratio (PTR) at secondary level (class 9-10)	30	30	The National Education Policy 2020 proposes to ensure a pupil-teacher ratio (PTR) of under 30:1 at each level of school education. India-21, Delhi-29, Haryana-15, Rajasthan-12 and U.P.-34, as per SDG India Index 2020-21.

Goal 5: Achieve gender equality and empower all women and girls

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Rate of crimes against women per 1,00,000 female population	0	0	This target is aligned with the global SDG target 5.2 that aims to eliminate all forms of violence against women and girls in the public and private spheres. India-62.4, Delhi-144.0, Haryana-108.5, Rajasthan-110.4 and U.P.-55.4, as per SDG India Index 2020-21.
Sex ratio at birth	950	950	The 2019 UNFPA report on “Sex Ratio at Birth in India: Recent trends and patterns” observes that in the absence of sex selection the Sex Ratio at Birth (SRB) is around 105 male births per 100 female births or around 950 female births per 1,000 male births. India-899, Delhi-844, Haryana-843, Rajasthan- 871 and U.P.-880, as per SDG India Index 2020-21.
Ratio of female to male average wage/salary earnings received among regular wage/salaried employees	1	1	This target corresponds to global SDG target 5.1 that aims to end all forms of discrimination against women. The target value is set to eliminate the wage gap between men and women for work of equal value. India-0.74, Delhi-0.75, Haryana-0.85, Rajasthan-0.79 and U.P.-0.94, as per SDG India Index 2020-21.
Per 1,00,000 women who have experienced cruelty/physical violence by husband or his relatives during the year	0	0	This target is aligned with the global SDG target 5.2 that aims to eliminate all forms of violence against women and girls in the public and private spheres. India-19.54, Delhi-40.76, Haryana-36.05, Rajasthan-49.03 and U.P.-17.22, as per SDG India Index 2020-21.



Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Percentage of elected women over total seats in the state legislative assembly	50	10	This target corresponds to the global SDG target 5.5 that aims to ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life. India-8.46, Delhi-11.43, Haryana-10.00, Rajasthan-12.00 and U.P.-10.61, as per SDG India Index 2020-21.
Ratio of female to male Labour Force Participation Rate (LFPR) (15-59 years)	1	1	This target corresponds to the global SDG target 5.5 that aims to ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life. India-0.33, Delhi-0.25, Haryana-0.21, Rajasthan-0.43 and U.P.-0.19, as per SDG India Index 2020-21.
Proportion of women in managerial positions including women in board of directors, in listed companies (per 1,000 persons)	245	250	This target corresponds to the global SDG target 5.5 that aims to ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life. The target has been fixed to be the average of the 3 best performing States. India-190, Delhi-188, Haryana-236, Rajasthan-181 and U.P.-243, as per SDG India Index 2020-21.
Percentage of currently married women aged 15-49 years who have their demand for modern methods of family planning satisfied	100	100	This target corresponds to the global SDG target 5.6 that aims ensure universal access to sexual and reproductive health and reproductive rights. India-72, Delhi-69.5, Haryana-81.3, Rajasthan-74.3 and U.P.-49.9, as per SDG India Index 2020-21.
Operational land holding gender wise (percentage of female operated operational holdings)	50	15	This target corresponds to the global SDG target 5.a that aims to undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land. India-13.96, Delhi-13.65, Haryana-14.76, Rajasthan-10.12 and U.P.-07.65, as per SDG India Index 2020-21.

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Percentage of rural population getting safe and adequate drinking water within premises through Piped Water Supply (PWS)	100	100	The Jal Jeevan Mission aims to provide piped water supply to the entire rural population by 2024. India-51.36, Delhi-Null, Haryana-97.41, Rajasthan-35.25 and U.P.-20.35, as per SDG India Index 2020-21.
Percentage of rural population having improved source of drinking water	100	100	Global SDG target 6.1 aims to achieve universal and equitable access to safe and affordable drinking water for all by 2030. India-97.44, Delhi-Null, Haryana-99.71, Rajasthan-92.28 and U.P.-99.63, as per SDG India Index 2020-21.
Percentage of individual household toilets constructed against target (SBM(G))	100	100	Global SDG target 6.2 aims to achieve access to adequate and equitable sanitation and hygiene for all and end open defecation by 2030. This is also in line with the objectives of the Government of India's Swachh Bharat Mission (Gramin). India-100, Delhi-100, Haryana-100, Rajasthan-100 and U.P.-100, as per SDG India Index 2020-21.



Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Percentage of districts verified to be ODF (SBM(G))	100	100	Global SDG target 6.2 aims to achieve access to adequate and equitable sanitation and hygiene for all and end open defecation by 2030. This is also in line with the objectives of the Government of India's Swachh Bharat Mission (Urban). India-100, Delhi-100, Haryana-100, Rajasthan-100 and U.P.-100, as per SDG India Index 2020-21.
Percentage of schools with separate toilet facility for girls	100	100	Global SDG target 6.2 aims to achieve access to adequate and equitable sanitation and hygiene for all and end open defecation by 2030. India-95.33, Delhi-100, Haryana-98.49, Rajasthan-90.44 and U.P.-95.51, as per SDG India Index 2020-21.
Percentage of industries (17 category of highly polluting industries/grossly polluting/red category of industries) complying with waste water treatment as per CPCB norms	100	100	Global SDG target 6.3 aims to improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials. India-88.40, Delhi-53.44, Haryana-96.86, Rajasthan-65.79 and U.P.-96.27, as per SDG India Index 2020-21.
Percentage of ground water withdrawal against availability	70	60	The report "National Compilation on Dynamic Ground Water Resources of India (2017)" by the Central Ground Water Board, Ministry of Jal Shakti, categorizes stages of groundwater extraction below 70 percent as "Safe". India-63.33, Delhi-120.00, Haryana-136.91, Rajasthan-139.87 and U.P.-70.18, as per SDG India Index 2020-21.
Percentage of blocks/man-dals/taluka over-exploited	0	0	This target corresponds to global SDG target 6.4 that aims to substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals to address water scarcity and global SDG target 6.6 that aims to protect and restore water-related ecosystems. India-17.24, Delhi-64.71, Haryana-60.94, Rajasthan-62.71 and U.P.-10.96, as per SDG India Index 2020-21.

Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Percentage of households electrified	100	100	This target corresponds to global SDG target 7.1 that aims to ensure universal access to affordable, reliable and modern energy services. India-99.99, Delhi-100, Haryana-100, Rajasthan-100 and U.P.-100, as per SDG India Index 2020-21.
Percentage of LPG+PNG connections against number of households	100	100	This target corresponds to global SDG target 7.1 that aims to ensure universal access to affordable, reliable and modern energy services. India-92.02, Delhi-147.34, Haryana-127.08, Rajasthan-108.88 and U.P.-106.83, as per SDG India Index 2020-21.



Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Annual growth rate of GDP (constant prices) per capita	7	7	This target is aligned with the global SDG target 8.1 that aims to sustain per capita economic growth with at least 7 percent gross domestic product growth per annum. India-5.1, Delhi-5.63, Haryana-5.99, Rajasthan-5.45 and U.P.-3.74, as per SDG India Index 2020-21.
Ease of Doing Business (EODB) Score (feedback score)	50	50	The “Business Reform Action Plan (BRAP) 2019 ranking of States” released by the Department for the Promotion of Industry and Internal Trade measured performance of the States/UTs by assigning full weightage to the feedback from respondents at the ground level, on effectiveness of the reforms. Average feedback score received by the 3 best performing States has been set as the target. India-71, Delhi-19.17, Haryana-13.24, Rajasthan-25.92 and U.P.-50.09, as per SDG India Index 2020-21.
Unemployment rate (%) (15-59 years)	3	3	Global SDG target 8.5 aims to achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities. Average of the 3 best performing States has been set as the target. India-6.2, Delhi-10.7, Haryana-9.8, Rajasthan-6.2 and U.P.-6.2, as per SDG India Index 2020-21.
Labour Force Participation Rate (LFPR) (%) (15-59 years)	68.3	68.3	Global SDG target 8.5 aims to achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value. Average of the 3 best performing States has been set as the target. India-53.6, Delhi-53.5, Haryana-50.4, Rajasthan-56.6 and U.P.-44.4, as per SDG India Index 2020-21.
Percentage of regular wage/salaried employees in non-agriculture sector without any social security benefit	0	0	This target corresponds to the global SDG target 8.8 that aims to protect labour rights and promote safe and secure working environments for all workers. India-51.9, Delhi-59.9, Haryana-56.1, Rajasthan-65.2 and U.P.-59.4, as per SDG India Index 2020-21.
Percentage of households covered with a bank account under PMJDY against target	100	100	The Pradhan Mantri Jan Dhan Yojana aims to provide at least one basic savings bank account to every household. India-99.99, Delhi-100, Haryana-100, Rajasthan-99.99 and U.P.-100, as per SDG India Index 2020-21.
Number of functioning branches of commercial banks per 1,00,000 population	31.26	31.26	Global SDG target 8.10 aims to strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all. Average of the 3 best performing States has been set as the target. India-11.69, Delhi-19.26, Haryana-18.39, Rajasthan-10.21 and U.P.-8.07, as per SDG India Index 2020-21.
Automated Teller Machines (ATMs) per 1,00,000 population	42.65	42.65	Global SDG target 8.10 aims to strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all. Average of the 3 best performing States has been set as the target. India-17.31, Delhi-41.10, Haryana-23.62, Rajasthan-14.16 and U.P.-9.61, as per SDG India Index 2020-21.
Percentage of women account holders in PMJDY	50	60	This target corresponds to the global SDG target 5.a that aims to undertake reforms to give women equal rights to economic resource and access to financial services, and to the global SDG target 8.10 that aims to expand access to banking, insurance and financial services for all. India-55.34, Delhi-47.07, Haryana-49.76, Rajasthan-59.85 and U.P.-54.74, as per SDG India Index 2020-21.



Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Percentage of targeted habitations connected by all-weather roads under Pradhan Mantri Gram Sadak Yojana (PMGSY)	100	100	Global SDG Target 9.1 AIMS to develop quality, reliable, sustainable and resilient infrastructure to support economic development and equitable access for all. It is aimed that all targeted unconnected habitations under PMGSY are connected. India-97.65, Delhi-Null, Haryana-100, Rajasthan-100 and U.P.-99.99, as per SDG India Index 2020-21.
Percentage Share of GVA in manufacturing to total GVA (current prices)	25	25	The “Make in India” initiative aims to raise the contribution of the manufacturing sector to 25 percent of the Gross Domestic Product (GDP) by the year 2025. As GDP is essentially a measure of GVA combined with net taxes, the same target has been used for GVA in manufacturing to total GVA. India-16.1, Delhi-5.20, Haryana-20.22, Rajasthan-10.39 and U.P.-14.54, as per SDG India Index 2020-21.
Manufacturing employment as a percentage of total employment	20	20	This target corresponds to the global SDG target 9.2 that aims to promote inclusive and sustainable industrialization and, by 2030, significantly raise industry’s share of employment and gross domestic product. Average of the 3 best performing States has been set as the target. India-12.07, Delhi-22.99, Haryana-17.60, Rajasthan-7.50 and U.P.-10.51, as per SDG India Index 2020-21.
Innovation score as per the India Innovation Index	100	100	The Global Innovation Index released by the World Intellectual Property Organization ranks countries based on a score range of 0-100, with 100 implying best performance. India-35.59, Delhi-46.60, Haryana-25.81, Rajasthan-20.83 and U.P.-22.85, as per SDG India Index 2020-21
Score as per Logistics Ease Across Different States (LEADS) Report	5	5	The Logistics Performance Index released by the World Bank ranks countries based on a score range of 1-5, 5 being the highest score. India-3.18, Delhi-3.36, Haryana-3.37, Rajasthan-3.16 and U.P.-3.08, as per SDG India Index 2020-21.
Number of mobile connections per 100 persons (mobile tele density)	100	100	This target aligns with Global SDG target 9.c which aims to significantly increase access to information and communications technology. One of the pillars of the “Digital India Initiative” is universal access to mobile connectivity. India-84.38, Delhi-190.61, Haryana-112.77, Rajasthan-81.89 and U.P.-67.62, as per SDG India Index 2020-21.
Number of internet subscribers per 100 population	100	100	This target aligns with Global SDG target 9.c which aims to significantly increase access to information and communications technology “Digital India Initiative” of the Government of India also aims to boost universal coverage of internet connectivity. India-55.41, Delhi-199.88, Haryana-59.33, Rajasthan-53.79 and U.P.-38.73, as per SDG India Index 2020-21.



Goal 10: Reduce inequality

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Percentage of population in the lowest two wealth quintiles	4.67	4.5	Global SDG target 10.1 aims to progressively achieve and sustain income growth of the bottom 40 percent of the population by 2030. Average of the 3 best performing States has been set as the target. India-40, Delhi-2.3, Haryana-9.7, Rajasthan-41.7 and U.P.-54.1, as per SDG India Index 2020-21.
Percentage of elected women over total seats in the State/UT (Lok Sabha elections)	50	25	This target corresponds to the global SDG target 10.2 that aims to empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status. India-14.39, Delhi-14.29, Haryana-10, Rajasthan-12 and U.P.-13.75, as per SDG India Index 2020-21.
Percentage of seats held by women in Panchayat Raj Institutions (PRIs)	33	25	As per provisions contained in Article 243 D of the Constitution, at least 1/3rd of the seats of Panchayati Raj Institutions should be reserved for women. India-45.62, Delhi-Null, Haryana-42.12, Rajasthan-51.32 and U.P.-33.34, as per SDG India Index 2020-21.
Ratio of transgender to male Labour Force Participation Rate (LFPR)	1	1	This target corresponds to the global SDG target 10.3 which aims to ensure equal opportunity and reduce inequalities of outcome. Hence, the target has been set as 1 to bring the transgender labour force participation rate at par with that of the male participation rate. India-0.64, Delhi-0.67, Haryana-0.67, Rajasthan-0.36 and U.P.-0.42, as per SDG India Index 2020-21.
Rate of total crimes against SCs (per 1,00,000 SC population)	0	0	This target corresponds to the global SDG target 10.3 that aims to ensure equal opportunity, eliminate discriminatory laws, policies and practices, and promote appropriate legislation, policies and action in this regard. India-22.8, Delhi-2.7, Haryana-21.2, Rajasthan-55.6 and U.P.-28.6, as per SDG India Index 2020-21.
Rate of total crimes against STs (per 1,00,000 ST population)	0	0	This target corresponds to the global SDG target 10.3 that aims to ensure equal opportunity, eliminate discriminatory laws, policies and practices, and promote appropriate legislation, policies and action in this regard. India-7.9, Delhi-Null, Haryana-Null, Rajasthan-19.5 and U.P.-63.6, as per SDG India Index 2020-21.

Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Percentage of urban households living in katcha houses	0	0	This target corresponds to the global SDG target 11.1 that aims to ensure universal access to adequate, safe and affordable housing and basic services, and upgrade slums, by 2030. India-0.80, Delhi-0.80, Haryana-0.20, Rajasthan-0.30 and U.P.-1.40, as per SDG India Index 2020-21.
Deaths due to road accidents in urban areas (per 1,00,000 population)	7.05	7.05	This target corresponds to the global SDG target 11.2 that focuses on improving road safety, and also the global SDG target 3.6 which aims to halve the number of global deaths and injuries from road traffic accidents. (Base year 2015) India-12.20, Delhi-7.08, Haryana-15.43, Rajasthan-13.52 and U.P.-18.18, as per SDG India Index 2020-21.



Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Percentage of wards with 100% door to door waste collection (SBM(U))	100	100	Swachh Bharat Mission in urban areas aims to operationalise 100 percent door to door collection of waste in all wards. India-96.77, Delhi-100, Haryana-93.94, Rajasthan-100 and U.P.-99.18, as per SDG India Index 2020-21.
Percentage of individual household toilets constructed against target (SBM(U))	100	100	Swachh Bharat Mission aims to provide universal sanitation coverage in urban areas through construction of IHHL units and community toilets. It aims for completion of construction of toilets targeted and sanctioned. India-105.00, Delhi-15.00, Haryana-93.00, Rajasthan-102.00 and U.P.-107.00, as per SDG India Index 2020-21.
Percentage of MSW processed to the total MSW generated (SBM(U))	100	100	This target corresponds to the global SDG target 11.6 that aims to reduce the adverse per capita environmental impact of cities by 2030, by focusing on municipal and other waste management. MSW processing is also critical to the success of the SBM (U). India-68.1, Delhi-55.2, Haryana-49.9, Rajasthan-77.0 and U.P.-68.3, as per SDG India Index 2020-21.
Percentage of wards with 100% source segregation (SBM(U))	100	100	Swachh Bharat Mission in urban areas aims to operationalise 100 percent segregation of waste in all wards. India-78.03, Delhi-20.07, Haryana-64.98, Rajasthan-82.00 and U.P.-74.32, as per SDG India Index 2020-21
Installed sewage treatment capacity as a percentage of sewage generated in urban areas	100	100	This target corresponds to the global SDG target 11.6 that aims to reduce the adverse per capita environmental impact of cities by 2030, by focusing on waste management. India-38.86, Delhi-70.23, Haryana-115.76, Rajasthan-29.60 and U.P.-41.19, as per SDG India Index 2020-21.
Percentage of urban households with drainage facility	100	100	This target corresponds to the global SDG target 11.1 that aims to ensure universal access to basic services. India-87.6, Delhi-97.5, Haryana-97.4, Rajasthan-89.1 and U.P.-92.1, as per SDG India Index 2020-21.

Goal 12: Ensure sustainable consumption and production patterns

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Per capita fossil fuel consumption (in kg.)	64.1	75	This target corresponds to the global SDG target 12.2 that aims to achieve sustainable management and efficient use of natural resources by 2030, and also to the global SDG target 8.4 that aims to improve global resource efficiency in consumption and production, and endeavours to decouple economic growth from environmental degradation. Average of the 3 best performing States has been set as the target. India-157.3, Delhi-291.9, Haryana-415.0, Rajasthan-166.2 and U.P.-91.1, as per SDG India Index 2020-21.
Percentage use of nitrogenous fertilizer out of total N,P,K, (Nitrogen, Phosphorous, Potassium)	57	57	The ratio considered ideal for balanced and sustainable use of fertilizers (N, P, and K) is 4:2:1, thus implying that the use of nitrogenous fertilizers out of the total mix should not exceed 57 percent. India-64.39, Delhi-89.01, Haryana-75.84, Rajasthan-70.63 and U.P.-73.72, as per SDG India Index 2020-21.
Hazardous waste generated per 1,000 population (Metric tonnes/ Annum)	4.04	2	This target corresponds to the global SDG target 12.5 that aims to substantially reduce waste generation through prevention, reduction, recycling and reuse. It is targeted to halve the current generation of hazardous waste. NCR target is fixed considering the Delhi figures. India-8.09, Delhi-2.18, Haryana-4.66, Rajasthan-8.15 and U.P.-1.12, as per SDG India Index 2020-21.



Quantity of hazardous waste recycled/utilized to total hazardous waste generated (%)	100	100	This target corresponds to the global SDG target 12.5 that aims to substantially reduce waste generation through prevention, reduction, recycling and reuse. ● India-44.89, Delhi-0.05 Haryana-177.46, Rajasthan-99.19 and U.P.-60.40, as per SDG India Index 2020-21.
Plastic waste generated per 1,000 population (Tonnes/Annum)	1.27	1.27	This target corresponds to the global SDG target 12.5 that aims to substantially reduce waste generation through prevention, reduction, recycling and reuse. It is targeted to halve the current generation of plastic waste. ● India-2.54, Delhi-11.49, Haryana-2.42, Rajasthan-1.37 and U.P.-1.14, as per SDG India Index 2020-21.
Percentage of BMW treated to total quantity of BMW generated	100	100	This target corresponds to the global SDG target 12.5 that aims to substantially reduce waste generation through prevention, reduction, recycling and reuse. ● India-86.91, Delhi-100, Haryana-100, Rajasthan-75.98 and U.P.-100, as per SDG India Index 2020-21.
Installed capacity of grid interactive bio power per 10 lakh population (MW)	21.81	2.0	This target corresponds to the global SDG target 12.a that aims at sustainable patterns of consumption and production. Average of the 3 best performing States has been set as the target. ● India-7.62, Delhi-2.56, Haryana-7.25, Rajasthan-1.54 and U.P.-9.25, as per SDG India Index 2020-21.

Goal 13: Take urgent action to combat climate change and its impacts

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Number of human lives lost per 1 crore population due to extreme weather events	0	0	This target corresponds to the global SDG target 13.1 which aims to strengthen resilience and adaptive capacity to climate-related hazards and natural disasters. The target has been set to 0 to imply that all States/UTs must be adequately prepared to ensure that no human life is lost due to extreme weather events. ● India-15.44, Delhi-Null, Haryana-1.06, Rajasthan-2.22 and U.P.-4.71, as per SDG India Index 2020-21.
Disaster preparedness score as per Disaster Resilience Index	50	50	The analytical study on “Disaster risks and resilience in India” by the Ministry of Home Affairs and the United Nations Development Programme, scores the States/UTs on a scale of 0-50. ● India-19.20, Delhi-25, Haryana-19.5, Rajasthan-18.5 and U.P.-16.5, as per SDG India Index 2020-21.
Percentage of renewable energy out of total installed generating capacity (including allocated shares)	40	40	This target corresponds to the global SDG target 13.2. India's Intended Nationally Determined Contribution (INDC) and aspires to achieve about 40 percent of cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030. ● India-36.37, Delhi-12.56, Haryana-23.23, Rajasthan-46.04 and U.P.-25.77, as per SDG India Index 2020-21.
CO ₂ saved from LED bulbs per 1,000 population (Tonnes)	103.22	105	This target corresponds to the global SDG target 13.2 that aims to integrate climate change measures into national policies, strategies and planning. UJALA scheme is one of the world's largest programmes that promote energy efficiency. Average of the 3 best performing States has been set as the target. ● India-28.24, Delhi-67.57, Haryana-55.44, Rajasthan-22.64 and U.P.-11.91, as per SDG India Index 2020-21.
Disability Adjusted Life Years (DALY) rate attributable to air pollution (per 1,00,000 population)	1442	1442	This target corresponds broadly to the global SDG target 13.2 and more specifically to global SDG targets 11.6 and 3.9 that aims to reduce the adverse impacts of air pollution. Average of the 3 best performing States has been set as the target. ● India-3469, Delhi-1890, Haryana-3928, Rajasthan-4528 and U.P.-4390, as per SDG India Index 2020-21.



Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Forest cover as a percentage of total geographical area	33	15	National Afforestation and Eco-Development Board aims to achieve 33 percent of the geographical area in the country under forest and tree cover. India-24.56, Delhi-21.91, Haryana-7.16 Rajasthan-7.23 and U.P.-9.20, as per SDG India Index 2020-21.
Tree cover as a percentage of total geographical area			
Percentage of area covered under afforestation schemes to the total geographical area	2.74	1.00	Global SDG target 15.2 aims to promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally. Average of the 3 best performing States has been set as the target. India-0.51, Delhi-Null, Haryana-0.38, Rajasthan-0.13 and U.P.-0.21, as per SDG India Index 2020-21.
Percentage of degraded land over total land area	5.46	5.00	Global SDG target 15.3 aims to combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strives to achieve a land degradation-neutral world by 2030. Average of the 3 best performing States has been set as the target. India-27.77, Delhi-4.92, Haryana-8.80, Rajasthan-52.69 and U.P.-11.00, as per SDG India Index 2020-21.
Percentage increase in area of desertification	0	0	Global SDG target 15.3 strives to combat desertification and achieve a land-degradation neutral world. Aichi Biodiversity Targets also aim to significantly reduce degradation and fragmentation and bring the rate of loss of all natural habitats, including forests, to at least half and where feasible brought close to zero. Hence, the target value has been set to zero to imply that no more land area must be allowed to be degraded into a state of desertification. India-1.98, Delhi-22.25, Haryana-7.75, Rajasthan-(-0.46) and U.P.-(-16.69), as per SDG India Index 2020-21.
Number of cases under Wildlife Protection Act (1972) per million hectares of protected area	0	0	Global SDG target 15.7 calls for urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products. The target value has been set to 0 to imply that all crimes against wildlife need to end. India-15, Delhi-Null, Haryana-90, Rajasthan-7 and U.P.-19, as per SDG India Index 2020-21.

Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Murders per 1,00,000 population	1	0	Global SDG target 16.1 aims to significantly reduce all forms of violence and related death rates everywhere. Average of the 3 best performing States has been set as the target. India-2.2, Delhi-2.6, Haryana-3.9, Rajasthan-2.1 and U.P.-1.7, as per SDG India Index 2020-21.
Cognizable crimes against children per 1,00,000 population	0	0	Global SDG target 16.2 aims to end abuse, exploitation, trafficking and all forms of violence against and torture of children. India-33.2, Delhi-139.0, Haryana-55.2, Rajasthan-25.9 and U.P.-21.4, as per SDG India Index 2020-21.



Indicator	Target		Justification of Target & NCR States Status as on 2020-2021
	National (by NITI)	NCR (by NCRPB)	
Number of victims of human trafficking per 10 lakh population	0	0	Global SDG target 8.7 aims to take immediate and effective measures to eradicate forced labour, and end modern slavery and human trafficking. ● India-4.95, Delhi-30.49, Haryana-0.69, Rajasthan-8.56 and U.P.-0.61, as per SDG India Index 2020-21.
Number of missing children per 1,00,000 child population	0	0	Global SDG target 16.2 aims to end abuse, exploitation, trafficking and all forms of violence against and torture of children. ● India-16.41, Delhi-113.48, Haryana-30.33, Rajasthan-12.81 and U.P.-3.59, as per SDG India Index 2020-21.
No. of courts per 1,00,000 population	4.25	4.31	Global SDG target 16.3 aims to promote the rule of law at the national and international levels, and ensure equal access to justice for all. Average of the 3 best performing States has been set as the target. NCR target is fixed based on Delhi figures. ● India-1.85, Delhi-4.31, Haryana-2.97, Rajasthan-1.90 and U.P.-1.58, as per SDG India Index 2020-21.
Cases under Prevention of Corruption Act and related sections of IPC per 10 lakh population	0.19	1.00	Global SDG target 16.3 aims to substantially reduce corruption and bribery in all their forms. Average of the 3 best performing states has been set as the target. ● India-3.17, Delhi-0.90, Haryana-3.09, Rajasthan-5.46 and U.P.-0.59, as per SDG India Index 2020-21.
Percentage of births registered	100	100	Global SDG target 16.9 aims to provide legal identity for all, including birth registration by 2030. ● India-89.3, Delhi-100, Haryana-94, Rajasthan-96.6 and U.P.-80.1, as per SDG India Index 2020-21.
Percentage of population covered under Aadhaar	100	100	Global SDG target 16.9 aims to provide legal identity for all, including birth registration by 2030. ● India-93.24, Delhi-125, Haryana-109, Rajasthan-92 and U.P.-90, as per SDG India Index 2020-21.

Source: NITI, SDG India Index & Dashboard, 2020-21 and NCRPB analysis.



CHAPTER-11. SMART AND DIGITAL NCR

Public Digital Platform (PDP) based approach to Public Service Delivery

1. A collaborative & secure approach to Public Service Delivery that enables a community of partners to build innovative solutions for societal benefit, using open digital assets that are anchored by accountable institution(s).
2. Collaborative ecosystem, for public & private bodies to build new solutions.
3. Secure by design, safeguarding individual agency and privacy, thereby promoting trust.
4. Open software, APIs, data, and standards, that is transparently accessible to guard against monopolistic behavior.
5. Accountable institution(s) with strong governance mechanisms that ensure sustainable and responsible outcomes.
6. Positive economic, social and/or governance impact in the lives of individuals and institutions (both public and private).
7. Public digital platforms can be organized on following 04 key dimensions:
 - a) **Nature of citizen-** Government service delivery, Governance outcome e.g. Fiscal deficiencies, Societal e.g. access to content, market
 - b) **Type of platform-** Micro-services (incl. Data Registries), Standards, Protocols, Software (Analytics, Data Exchange, etc.), Stacks, E2E Services/Solutions
 - c) **Accountability-** Government (direct, SPV/ PPP), Private
 - d) **Role of Government-** Key participant (G2B, G2C), Enabler (provides either Enabling tech architecture, Data, or Funding), No required role
8. Public digital platforms should have following tech. and Non tech. layers:
 - A). **NON-TECH. LAYER**
 - a) **Community-** Collaborative ecosystem of people engaged in building PDPs from the government, market and civil society.
 - b) **Legal and regulatory frameworks-** Law and rules that govern activities in a particular sector, especially the regulatory architecture which informs the digital architecture
 - c) **Institutions and Governance-** The institutions that govern PDPs, as well as institutions that build, own, manage, maintain the PDP and are held accountable for it.
 - d) **Privacy-** A layer comprising of norms and principles as well as technology and tools that ensures data privacy, security and agency across PDPs.
 - B). **TECH. LAYER**
 - a) **Open Standards/Specifications/APIs-** Open standards and APIs help to break down silos between different service providers, thereby creating a more collaborative & competitive marketplace.
 - b) **Registries/ Data Layer-** The 'data organizations' layer of a PDP is typically an electronic registry (of people/organizations/assets etc.)
 - c) **Analytics-** Artificial Intelligence and Machine Learning powered data analytics layer to enrich the platform with each use, and support decision making tools.
 - d) **Solutions/ Applications/ User interfaces-** The layer that users interact with comprising of various solutions 'unlocked' by the PDP, accessed by the public and by entrepreneurs through appropriate modes.
9. Key enablers that should be unlocked include Resourcing/ funding, Procurement rules, Talent planning, Inter-departmental coordination & accountability, Technology sharing.



Annexure-P-11.2

Suggested smart/ digital infrastructure policies which could be elaborated in Sub-Regional Plan and Master/ Development Plans

1. **Enhance access to broadband³⁷** - Strengthen institutional and regulatory frameworks for connectivity and implement regulatory measures and policies that are based on consistent, clear and transparent principles, to foster competition in both fixed and mobile broadband markets and extend access to affordable and high-quality communication services.
2. Common duct/ trenching for communication systems be created along the road and across the road so that roads are not cut/dug (e.g. Dholera and other cities of DMIC corridor).
3. **Increase effective use of digital services** - Increase effective use of digital services by fostering digital skills for people, Government and Private organizations/ institutions, supporting economic development to overcome challenges in adopting digital tools, and harnessing the potential of digital government to promote relevant digital content.
4. **Unleash innovation in start-ups and young firms** - Unleash innovation by re-evaluating regulations that are not fit for a fast-changing digital age, promote digital start-ups and young firms with the support they need at each stage of their life cycle, and foster policy experimentation in support of the digital transformation.
5. **Promote an inclusive digital transformation** - Promote inclusiveness by increasing access to and use of digital services and applications by vulnerable and rural populations, addressing gender digital divides, and preparing workforce for the changing work environment brought about by the digital transformation.
6. **Strengthen trust** - Strengthen trust of people & entrepreneurs in digital tools and services by raising awareness about digital security risk management, developing privacy and digital security frameworks with a whole-of-society perspective, and continuing to facilitate cross-border data flows.
7. **Foster e-commerce** - Foster e-commerce by removing barriers to e-commerce, including those that distinguish between online and offline commerce, and by harmonizing regulatory frameworks in the region.
8. **Leverage regional integration** - Leverage regional integration, regional connectivity infrastructures, cross-border data flows and sharing of experiences in the region to minimize frictions and costs for cross-border e-commerce trade and to improve connectivity across the sub-region & State.
9. **Establish a strategic and coherent policy framework** - Establish and effectively implement a strategic and coherent policy framework for the digital transformation of through co-ordinating the government institutions and stakeholders dealing with digital policy issues, identifying the main challenges and policy objectives, and build an evidence-based action plan with clear milestones and allocation of responsibilities.
10. **Stimulate ecosystems and cultivate a collaborative culture³⁸** - Private industry partners such as project developers, utilities companies, service providers, and technology vendors have a key role to play in developing smart solutions (startup ecosystems). Governments should boost innovation and collaboration through initiatives like innovation labs, developer contests, and application playgrounds.
11. **Incorporate smart requirements into publicly funded infrastructure programs** in areas such as mobility, healthcare, security, lighting, environment, energy, construction, and communications. Concentrate on key role as a government. Fund or build the “need to have” infrastructure for residents, and make sure that the “nice to have” applications are covered by private initiatives and partnerships.
12. E-Governance with core components i.e. IT Infrastructure, Platforms, Common Software, Public Interface for Service delivery, Office Automation, Startup Ecosystem, Jan Soochna Portal, etc. should be established as well

³⁷ <https://www.oecd.org/going-digital/southeast-asia-connecting-SMEs.pdf>

³⁸ <https://www.nokia.com/blog/10-recommendations-creating-smart-city/>



as improved in NCR. National Institute of Urban Affairs (NIUA) has created e-Governments Foundation to transform urban governance with the use of scalable and replicable technology solutions that enable efficient and effective municipal operations, better decision making, and contact-less urban service delivery³⁹. Further, National Urban Governance Platform enables real-time monitoring of citizen service delivery. MoHUA has taken an initiative to create National Urban Innovation Stack (NUIS) to support development of cities across India and to create a resource-rich ecosystem of learning, sharing and disseminating for city managers and primary stakeholders in the urban transformation of India. Such platforms should be widely used by the NCR States to excel in service delivery digitally.

13. Future investment approach should be of Good-tech: 'Technology for good' for Access to aspirational services, Livelihoods, Accountability of governments and 'Responsible tech'- militate against the risk of harms from tech.
14. Use of 3D printing in many fields, especially in construction should be adopted in NCR for better execution and accuracy. For delivering good design – Design analysis and visualisation - where appropriate, visual, environmental and movement modelling / assessments should be undertaken to analyse potential design options for an area, site or development proposal. These models, particularly 3D virtual reality and other interactive digital models, should, where possible, be used to inform and engage locals in the planning process.
15. **Reliable and easily accessible digital infrastructure** - Both private individuals and businesses in the region should have a modern, reliable, safe and cost effective basic digital infrastructure at their disposal. Companies, their employees and indeed the entire population benefit from good **digital offerings and from fit-for-purpose regulations on data protection and data control**. Protection of peoples private sphere should be ensured and sufficient options for exercising control over their personal data be created.
16. **Harness Technology to Improve Travel And Anticipate Future Impacts:**
 - a) Departments of Transport and local agencies should work toward implementing a regional, multi-jurisdictional traffic management centre, either virtual or traditional.
 - b) Departments of Transport, Toll companies and Local Bodies/agencies should enhance communication and coordination to improve work zone management.
 - c) Highway and transit agencies should continue to share operational information and expand coordination opportunities.
 - d) Work with stakeholders to develop a regional communications plan and update the regional ITS architecture. All partner agencies should establish a program to modernize traffic signals, including the provision of safety and centralized communications.
 - e) Highway agencies should review traffic signal policies, ensure up-to-date signal timing plans to minimize delay and crashes, and implement adaptive signal timing where appropriate.
 - f) Maintain highway traffic signal inventory.
 - g) Departments/ Agencies at Sub-Regional level to work with transportation agencies to fund and execute planning activities that work toward implementing active expressway management, active arterial management, and integrated corridor management.
17. **Role of Video Surveillance could be used for Safety & security objectives:**
 - a) Video summarization - Create a trailer of the captured video depicting relevant movements or objects of interest, traffic survey, etc.
 - b) Crowd detection - Estimate crowd density, flow, etc. and detect suspects

³⁹ <https://smartnet.niua.org/content/e27ddfb3-0d93-4291-95cf-7c16a83dfe7e>



- c) Intrusion detection - Detection of moving objects in restricted areas and detect human v/s non-human entities
- d) Tracking objects of interest in videos - Use of Kalman filters, Particle filters, etc.

18. Integrate Existing and New Modes into an digitally Accessible Multimodal Network

3 layers of “smartness” to elevate life in cities of the future⁴⁰

3 layers of “smartness” will elevate life in cities of the future



Figure P-11.1.1: 3 layers of “smartness” to elevate life in cities of the future

Source: McKinsey Global Institute analysis

19. For promoting Innovation, Technology and Collaboration - offer platforms and conditions conducive to promoting innovation, technology and collaboration between economic sectors:

- a) consolidate and foster a knowledge and technology corridor in NCR and to develop new anchor sites for science park/industrial estate use.
- b) provide suitable land and space to cater for the development needs of universities, higher education and training institutions, science and technology parks, incubation and start-up spaces, and innovation and technology companies.
- c) adopt appropriate planning measures to promote and facilitate a tech-ecosystem, entrepreneurship and business start-ups, and collaboration.

20. Block Chain - for enabling digitalization of contracts as it provides authentication between parties and information encryption of data that gradually increments while it is processed in a decentralized network. The Block Chain technology has the potential to disrupt the world of banking through enabling crypto-currencies global money transfers, payment solution smart contracts, automated banking records and digital assets in addition to providing user anonymity. Decentralized personal data management systems based on Block chain ensure users the own control of their data and digital content distribution operated by user rights. The decentralization of a consensus method that uses a credibility score is applied to contracts management such as digital rights management. The Block Chain has already been applied in Smart Grids by providing energy transaction security in decentralized trading, Intelligent Transport Systems on a seven layer conceptual model that emulates the OSI model, Smart Devices providing a secure communication platform in a Smart City, control and configure devices for the Internet of Things, Smart Homes and Digital Documentation⁴¹.

⁴⁰ <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/smart-cities-digital-solutions-for-a-more-livable-future#>

⁴¹ *Smart Cities 2018*, 1, 134–154; doi:10.3390/smartcities1010008



CHAPTER-13. IMPLEMENTATION STRATEGIES AND RESOURCE MOBILIZATION**CHECKLISTS****Checklists for Preparation of Sub-Regional Plans, District Development Plans and Master Plans/Development Plans****1. SUB-REGIONAL PLANS**

- 1.1 The Sub-Regional Plans (SRPs) should be prepared in accordance with the Regional Plan-2041 (RP-41).
- 1.2 The SRP should be prepared on GIS platform using satellite imageries on a suitable working / input scale preferably 1:10,000 but the signed/ published maps can be suitably detailed by the State Government which could as far as possible be 1:50,000 or better scale.
- 1.3 The SRP should contain detailed proposals for all the sectors listed in the RP-41.
- 1.4 All the Policy Zones should be clearly outlined and earmarked on the Map.
- 1.5 Entire portion of CNCR, within the sub-region, should be notified and clearly indicated in the SRPs.
- 1.6 The numbers of sector wise facilities to be mandatorily created as per RP-41 provisions shall be clearly indicated in the SRP, along with locations of such facilities as far as feasible.
- 1.7 The locations of the other Projects envisaged in RP-41 should also be indicated in the SRP.
- 1.8 The earmarking of land for different landuses in the sub-region, as required for different sectors, as provided in the RP-41 should be clearly indicated. Further, SRPs shall preferably provide detailed negative list of prohibited landuses/ use premises in various Policy Zones, as applicable.
- 1.9 Special attention should be given to policies related to economic growth, transport, water and drainage, sanitation, housing and urban regeneration, and environment as provided in RP-41.
- 1.10 SRPs should clearly bring out steps proposed for creation of Future ready citizen infrastructure in sectors like health, education, skilling, sports, safety and social care system, digital infrastructure as provided in RP-41.
- 1.11 SRPs should also detail out the sub-regional strategies for complying with implementation and resource mobilisation strategies along with compliance of regulatory reforms outlined in RP-41.
- 1.12 The SRPs may include any such proposals which may be considered appropriate for harmonious development of the sub-region.

2. DISTRICT DEVELOPMENT PLANS

- 2.1 The District Development Plans (DDPs) should be prepared in accordance with the Regional Plan-2041 (RP-41).
- 2.2 The DDP should be prepared on GIS platform using satellite imageries on a suitable working/ input scale preferably 1:10,000 but the signed/ published maps can be suitably detailed by the State Government which could as far as possible be 1:50,000 or better scale.
- 2.3 The DDP should contain detailed proposals for all the sectors listed in the RP-41.
- 2.4 All the Policy Zones, as applicable should be clearly outlined and earmarked on the Map.
- 2.5 Entire portion of CNCR, within the district, should be notified and clearly indicated in the DDP.
- 2.6 The numbers and locations of sector wise facilities to be mandatorily created as per RP-41 provisions shall be clearly indicated in the DDP.



- 2.7 The locations of the other Projects envisaged in RP-41 should also be indicated in the DDP.
- 2.8 The earmarking of land for different landuses in the district, as required for different sectors, as provided in the RP-41 should be clearly indicated. Further, DDPs shall preferably provide detailed negative list of prohibited landuses/ use premises in various Policy Zones, as applicable.
- 2.9 Special attention should be given to policies related to economic growth, transport, water and drainage, sanitation, housing and urban regeneration, and environment as provided in RP-41.
- 2.10 DDPs should clearly bring out steps proposed for creation of Future ready citizen infrastructure in sectors like health, education, skilling, sports, safety and social care system, digital infrastructure as provided in RP-41.
- 2.11 DDPs should also detail out district level strategies for complying with implementation and resource mobilisation strategies along with compliance of regulatory reforms outlined in RP-41.
- 2.12 The DDPs may include any such proposals which may be considered appropriate for harmonious development of the district.

3. MASTER PLANS/ DEVELOPMENT PLANS

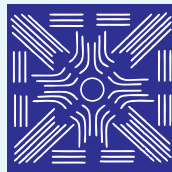
- 3.1 The Master Plans / Development Plans (MPs/DPs) should be prepared in accordance with the Regional Plan-2041 (RP-41).
- 3.2 The MPs/DPs should be prepared on GIS platform using satellite imageries on a suitable scale preferably 1:4,000 or better scale as per as feasible.
- 3.3 The MPs/DPs should contain detailed proposals for all the sectors listed in the RP-41, as applicable.
- 3.4 All the Policy Zones, as applicable, should be clearly outlined and earmarked on the Map.
- 3.5 Entire portion of CNCR, as applicable, should be notified and clearly indicated in the MPs/DPs.
- 3.6 The numbers and locations of sector wise facilities to be mandatorily created as per RP-41 provisions shall be clearly indicated in the MPs/DPs.
- 3.7 The locations of the other Projects envisaged in RP-41 should also be indicated in the MPs/DPs.
- 3.8 The earmarking of land for different landuses in the MP/DP areas, as required for different sectors, as provided in the RP-41 should be clearly indicated. Further, MPs/DPs shall preferably provide detailed negative list of prohibited landuses/ use premises in various Policy Zones, as applicable.
- 3.9 Special attention should be given to policies related to economic growth, transport, water and drainage, sanitation, housing and urban regeneration, and environment as provided in RP-41.
- 3.10 MPs/DPs should clearly bring out steps proposed for creation of Future ready citizen infrastructure in sectors like health, education, skilling, sports, safety and social care system, digital infrastructure as provided in RP-41.
- 3.11 MPs/DPs should also detail out city level strategies for complying with implementation and resource mobilisation strategies along with compliance of regulatory reforms outlined in RP-41.
- 3.12 The MPs/DPs may include any such proposals which may be considered appropriate for harmonious development of the sub-region.



**ANNEXURES TO
DRAFT REGIONAL PLAN - 2041
NATIONAL CAPITAL REGION**

**SECTION - II
DATA ANNEXURES**

December 2021



NATIONAL CAPITAL REGION PLANNING BOARD
MINISTRY OF HOUSING AND URBAN AFFAIRS, GOVERNMENT OF INDIA
CORE 4-B, FIRST FLOOR, INDIA HABITAT CENTRE, LODHI ROAD, NEW DELHI - 110003

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1. INTRODUCTION: BACKGROUND AND VISION

Composition of the NCR Planning Board

रजिस्ट्री सं० डी० एल०-33004/99

REGD. NO. D. L.-33004/99



असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

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आवासन और शहरी कार्य मंत्रालय

(दिल्ली प्रभाग)

अधिसूचना

नई दिल्ली, 22 नवम्बर, 2017

का.आ. 3706(अ).—राष्ट्रीय राजधानी क्षेत्र योजना बोर्ड नियम, 1985 के नियम 3 और 4 के साथ पठित राष्ट्रीय राजधानी क्षेत्र योजना बोर्ड अधिनियम, 1985 (1985 का 2) की धारा 3 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए और ऐसे अधिक्रमण से पहले किए गए अथवा किए जाने हेतु छोड़े गए कार्यों के अलावा, पूर्व अधिसूचनाओं का अधिक्रमण करते हुए, केन्द्र सरकार एतद्वारा राष्ट्रीय राजधानी क्षेत्र योजना बोर्ड का निम्नवत पुनर्गठन करती है :—

- | | |
|--|------------|
| 1. केन्द्रीय राज्य मंत्री (स्वतंत्र प्रभार), आवासन और शहरी कार्य | अध्यक्ष |
| 2. मुख्य मंत्री, हरियाणा | सदस्य |
| 3. मुख्य मंत्री, राजस्थान | सदस्य |
| 4. मुख्य मंत्री, उत्तर प्रदेश | सदस्य |
| 5. उप राज्यपाल, राष्ट्रीय राजधानी क्षेत्र दिल्ली | सदस्य |
| 6. मुख्य मंत्री, राष्ट्रीय राजधानी क्षेत्र दिल्ली | सदस्य |
| 7. शहरी विकास मंत्री, राजस्थान सरकार | सदस्य |
| 8. शहरी विकास मंत्री, उत्तर प्रदेश सरकार | सदस्य |
| 9. अध्यक्ष, रेलवे बोर्ड | सदस्य |
| 10. सचिव, सड़क परिवहन और राजमार्ग मंत्रालय | सदस्य |
| 11. सचिव, आवासन और शहरी कार्य मंत्रालय | सदस्य |
| 12. मुख्य सचिव, हरियाणा सरकार | सदस्य |
| 13. मुख्य सचिव, राजस्थान सरकार | सदस्य |
| 14. मुख्य सचिव, उत्तर प्रदेश सरकार | सदस्य |
| 15. मुख्य सचिव, राष्ट्रीय राजधानी क्षेत्र, दिल्ली सरकार | सदस्य |
| 16. प्रधान सचिव, नगर और ग्राम नियोजन विभाग हरियाणा सरकार | सदस्य |
| 17. सदस्य सचिव, राष्ट्रीय राजधानी क्षेत्र योजना बोर्ड | सदस्य सचिव |

6840 GI/2017

(1)



सहयोजित सदस्य

1. सचिव-पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय
2. मुख्य नियोजक – टीसीपीओ, भारत सरकार

[फा. सं. के-11019/3/2012-डीडीVI]

एम. के. शर्मा, अवर सचिव

**MINISTRY OF HOUSING AND URBAN AFFAIRS
(DELHI DIVISION)
NOTIFICATION**

New Delhi, the 22nd November, 2017

S.O. 3706(E).—In exercise of the powers conferred by Section 3 of the National Capital Region Planning Board Act, 1985 (2 of 1985) read with rules 3 and 4 of the National Capital Region Planning Board Rules, 1985 and in supersession of the earlier Notifications except in respect of things done or omitted to be done before such supersession, the Central Government hereby reconstitutes the National Capital Region Planning Board as follows:—

1. Union Minister of State (Independent Charge), Housing and Urban Affairs	Chairman
2. Chief Minister of Haryana	Member
3. Chief Minister of Rajasthan	Member
4. Chief Minister of Uttar Pradesh	Member
5. Lieutenant Governor, National Capital Territory of Delhi	Member
6. Chief Minister of NCT-Delhi	Member
7. Minister of Urban Development, Government of Rajasthan	Member
8. Minister of Urban Development, Government of Uttar Pradesh	Member
9. Chairman, Railway Board	Member
10. Secretary, Ministry of Road Transport and Highways	Member
11. Secretary, Ministry of Housing and Urban Affairs	Member
12. Chief Secretary, Government of Haryana	Member
13. Chief Secretary, Government of Rajasthan	Member
14. Chief Secretary, Government of Uttar Pradesh	Member
15. Chief Secretary, Government of NCT-Delhi	Member
16. Principal Secretary, Town & Country Planning Department, Government of Haryana	Member
17. Member Secretary, National Capital Region Planning Board	Member Secretary

CO-OPTED MEMBERS

1. Secretary – Ministry of Environment, Forest & Climate Change
2. Chief Planner – TCPO, Govt. of India

[F. No. K-11019/3/2012-DDVI]

M. K. SHARMA, Under Secy.



Annexure D-1.2

CONSTITUTION OF PLANNING COMMITTEE

Section 4(1) & (2) of the NCRPB Act, 1985 mandates the constitution of a Planning Committee. The Member Secretary of the Board is the ex-officio Chairman of the Planning Committee. The constitution of the Planning Committee is given in **Table D-1.2.1:-**

Table No. D-1.2.1 Constitution of the Planning Committee

1.	Member Secretary, NCR Planning Board	Chairman
2.	Joint Secretary, Ministry of Urban Development (now Ministry of Housing and Urban Affairs) dealing with Housing and Urban Development	Member
3.	Secretary-in-charge of Urban Development, Haryana	Member
4.	Secretary-in-charge of Urban Development, Rajasthan	Member
5.	Secretary-in-charge of Urban Development Uttar Pradesh	Member
6.	Secretary-in-charge of Urban Development NCT Delhi	Member
7.	Vice-Chairman, Delhi Development Authority	Member
8.	Chief Planner, Town and Country Planning Organization	Member
9.	Director, Town and Country Planning Department, Haryana	Member
10.	Chief Town Planner, Government of Rajasthan	Member
11.	Chief Town and Country Planner, Government of Uttar Pradesh	Member

Co-opted Members:

1. Senior Adviser (HUD), Planning Commission (now NITI Aayog)
2. Chairman-cum-Managing Director, Housing & Urban Development Corpn.
3. Joint Secretary (UT), Ministry of Urban Development (now Ministry of Housing and Urban Affairs),
4. Joint Secretary (IA), Ministry of Environment & Forest, Govt. of India
5. Chief Regional Planner, NCRPB



Annexure-D-1.3

CONSTITUENT AREAS OF NCR

1. As per the NCR Planning Board Act, 1985, NCR covered an area of 30,242 sq. km consisting of whole of NCT of Delhi, six districts of Haryana viz. Gurugram, Faridabad, Sonapat, Rohtak (including Jhajjar tehsil) and Panipat & Rewari tehsils those were then in Karnal and Mahendragarh districts respectively; three districts of Uttar Pradesh viz. Bulandshahr, Meerut (then including Baghpat tehsil), and Ghaziabad (then including Hapur tehsil) and some part of the Alwar district of Rajasthan.
2. As defined in the Schedule {Section 2(f)} of the NCRPB Act, 1985 and the subsequent notifications of 14.03.1986 and 23.08.2004 (to include remaining part of Alwar district) the National Capital Region (NCR) covered an area of about 34,144 sq. km. falling in the territorial jurisdictions of four State Governments, namely, National Capital Territory of Delhi, Haryana, Uttar Pradesh and Rajasthan. The Regional Plan-2021 prepared for the aforementioned area was notified in 2005.

3. Subsequently, certain more areas/districts were added in the NCR. Details are as under:

Bhiwani & Mahendragarh districts of Haryana and Bharatpur district of Rajasthan	Govt. of India vide Gazette Notification dated 01.10.2013
Jind and Karnal districts of Haryana and Muzaffarnagar district of Uttar Pradesh	Govt. of India vide Gazette Notification dated 24.11.2015
Shamli district of Uttar Pradesh	Govt. of India vide Gazette Notification dated 16.04.2018.

4. The NCR as notified covers the whole of NCT-Delhi and 24 districts of Haryana, Uttar Pradesh and Rajasthan, covering an area of about 55,083 sq. kms. The sub-region wise details are given in **Table D-1.3.1**.

Table – D-1.3.1 Sub-region wise Districts, Area & Population

Sub-Region	Name of the District	Area in sq. kms.	Population-2011 (in lakh)
Haryana	Faridabad, Gurgaon, Mewat, Rohtak, Sonapat, Rewari, Jhajjar, Panipat, Palwal, Bhiwani, Charkhi Dadri, Mahendragarh, Jind and Karnal	25,327	164.3
Uttar Pradesh*	Meerut, Ghaziabad, Gautam Budh Nagar, Bulandshahr, Baghpat, Hapur, Muzaffarnagar and Shamli	14,825	187.1
Rajasthan	Alwar and Bharatpur	13,447	62.2
Delhi	Whole of NCT Delhi	1,483	167.9
	Total	55,083	581.5

5. Reorganization of districts

Subsequent to constitution of NCR, several reorganizations of districts has been made as given below:

- a) Baghpat district in Uttar Pradesh was separated from Meerut in 1997.
- b) Gautam Buddha Nagar district was created out of the existing NCR districts of Ghaziabad and Bulandshahr in 1997.
- c) Jhajjar district was carved out of Rohtak district in 1997.
- d) Mewat (Renamed as “Nuh” in 2016) district was created out of the existing NCR districts of Gurugram and Faridabad in 2005.
- e) Palwal district was carved out of Faridabad district in 2008.
- f) Hapur district was carved out from Ghaziabad district on 28 September 2011.
- g) Charkhi Dadri district was carved out of Bhiwani district in Haryana in 2016.
- h) Shamli district in Uttar Pradesh was separated from Muzaffarnagar district in 2011.



Annexure-D-1.4

PROJECTS FINANCED BY NCRPB

Table: D-1.4.1 Overview of projects financed by NCRPB (as on 31.07.21)

Rs. In Cr.

S. No.	States	Status	No. of projects	Estimated cost	Loan sanctioned	Loan released by NCRPB	Balance Loan to be released
1	Rajasthan [including CMA- Jaipur]	Ongoing	53	3436	2426	2152	274
		Completed	32	1712	655	617	0
	Sub Total		85	5148	3082	2770	274
2	UP [including CMA- Bareilly]	Ongoing	3	5808	1655	1600	54
		Completed	54	3314	1651	1413	0
	Sub Total		57	9122	3306	3013	54
3	Haryana [including CMA- Hissar]	Ongoing	31	2226	1562	473	389
		Completed	181	14420	6680	5843	0
	Sub Total		212	16646	8242	6316	389
4	NCT-Delhi	Ongoing	1	102	76	20	56
		Completed	2	521	310	310	0
	Sub Total		3	623	386	330	56
5	CMA –Patiala in Punjab	Ongoing	1	208	153	31	122
		Completed	2	79	46	46	0
	Sub Total		3	287	199	77	122
6	CMA –Gwalior in M P	Ongoing	2	475	341	32	309
		Completed	4	134	101	101	0
	Sub Total		6	609	442	133	309
	Total	Ongoing	91	12254	6213	4308	1205
		Completed	275	20180	9444	8331	0
	Grand Total		366	32435	15657	12639	1205

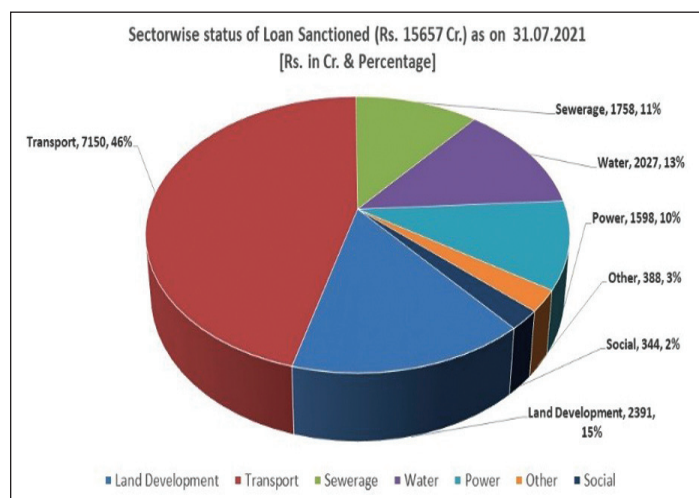


Figure D-1.4.1: Sector wise status of loan

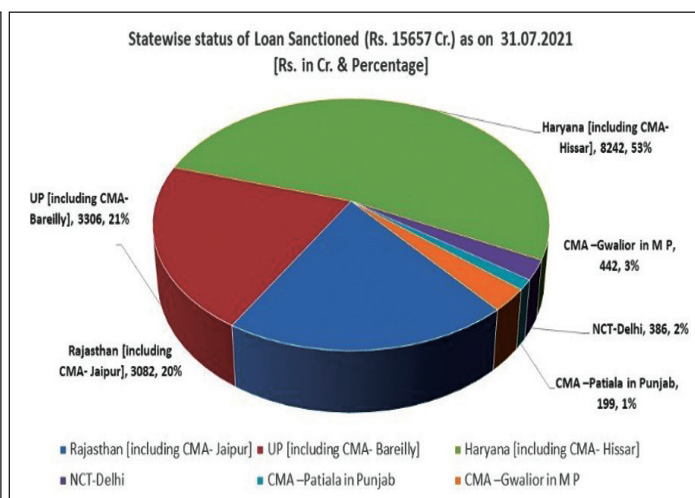


Figure D-1.4.2: State wise status of Estimates

Further state wise summary of number of Projects funded by NCRPB till 31st July, 2021 and List of State wise/ Agency wise ongoing/completed infrastructure projects with loan assistance from NCRPB is given at **Annexure-D-1.4.1**.



Annexure-D-1.4.1

Table: D-1.4.1.1 State-wise summary of number of projects funded by NCR Planning Board (as on 31.07.2021)

S. No.	Status	Haryana	UP	Rajasthan	NCT-Delhi	CMA – Gwalior in Madhya Pradesh	CMA – Jaipur in Rajasthan	CMA – Patiala in Punjab	CMA – Kota in Rajasthan	CMA – Bareilly in Uttar Pradesh	CMA – Hisar in Haryana	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Ongoing	31	3	46	1	2	7	1	0	0	0	91
2	Completed	178	52	28	2	4	1	2	3	2	3	275
	Total	209	55	74	3	6	8	3	3	2	3	366

Table D-1.4.1.2: State-wise/Agency-wise Ongoing Infrastructure projects with loan assistance from NCRPB

S.No.	Name of the Projects
	Haryana Sub Region
	PWD (B&R), Haryana
1	Construction of 2 lane ROB at Hodal Hassanpur road on Delhi Palwal Mathura Railway line at L/C No. 553
2	Two lane ROB at Sonapat Purkhas road near sugar mill on Delhi Ambala Railway line L/C No. 29
3	Construction of Road from NH-10 to NH-71 at southern Bye Pass in Rohtak district
4	Construction of 4 lane ROB at Lakhanmajra Meham road at L/C 79 on Delhi Bhatinda Railway line in Rohtak District
5	Construction of 2 lane ROB at L/C No. 54 on Jind Panipat section (location 66/9-10) crossing road along with Delhi water carrier link channel in Panipat district
6	Construction of 2 lane ROB at LC No. 55 on Jind Panipat Section Location 67/10-11 over road on Panipat Kabri road in Panipat district
7	2 Lane ROB at LC No. 564 of Mumbai Delhi Railway line on Palwal Hassanpur (Rasulpur) Road in Palwal District
8	2 Lane ROB at LC No. 561 of Mumbai Delhi Railway line on Palwal Bamni Khara Hassanpur Road in Palwal District
9	Upgradation of existing Sonapat-Rathdhana Narela road from Km 2.310 to 14.800 in Sonapat District (from ITI Chowk to Safiabad village upto Sonapat District Boundary), Sonipat
10	Construction of link road from Rewari-Narnaul road to Rewari Jhajjar via Rewari Dadri road and Rewari Mohindergarh Road including 3 no. ROB (Proposed Bye-pass), Rewari
11	Construction of 2 lane Relief Road from Ghogripur to Haryana-Delhi Border near Hareveli Village along the banks of Western Yamuna Canal (WYC) falling in Sonipat District
12	Widening and Strengthening of Tauru Sarai Road upto Kota Khandewala from Km. 0.00 to 12.20 in Nuh District
13	Widening and Strengthening with reconstruction of Punhana Shikrawa road from km. 0.00 to 9.83 in Nuh District
14	Widening and strengthening with reconstruction on Punhana Kot Road from km. 000 to 11.30 in Nuh district
15	Improvement of Palwal Hathin Utawar road (MDR-135) by 4 lanning/raising/CC pavement/ strengthening in Palwal and Nuh district (length 22.400 km)
16	Improvement of connectivity of Faridabad town with KGP Expressway by providing divided carriageway on Ballabgarh Chhainsa Mohana road from km. 3.00 (bye pass road) upto km. 14.96 (interchange at KGP) in Faridabad district
17	Upgradation by providing widening and strengthening of existing road from Sonipat to Ganaur road via Kami (km. 0.00 to 13.600) with link to GT road (NH-44) via Lalehri-Larsouli (Km. 0.00 to 4.63).
18	Improvement by providing widening (7 mtr to 10 mtr) from km 6.42 to 22.42 & strengthening from km 22.42 to 26.62 o existing Rewari-Shahjahanpur road (SH-15) in Rewari district (ID 1447)
19	Improvement by way providing 4-lanning (i) CCP of existing Rewari Bawal road from Km 1.60 to 10.91 in Rewari District (ODR VT) (ID 9957) (ii) CCP of existing Rewari Bawal road from Km 11 to 12.75 in Rewari District (ODR VT) (ID 1449)
20	Improvement by providing widening (5.50 mtr to 7 mtr) and strengthening of existing Kund Khol Mandola road from km 0.00 to 18.82 in Rewari district (ID 1606)
	PHED Haryana
21	Providing renovation of existing 7 MLD STP based on MBBR technology followed by tertiary treatment and chlorination, Ganaur town in Sonipat district



S.No.	Name of the Projects
22	Providing renovation of existing 4.5 MLD STP based on MBBR technology followed by tertiary treatment and chlorination, Kharkhoda town in Sonipat district
23	Upgradation and renovation of existing 5 MLD STP based on MBBR technology followed by tertiary treatment in Samalkha town in Panipat district
24	Upgradation of existing 5.5 MLD STP & 5 MLD STP (MBBR technology) followed by tertiary treatment & chlorination at Kosli Road & Sampla road respectively alongwith some balance pipeline laying, Jhajjar town
25	Sewerage network in left out colonies & newly approved colonies and tapping of drains to implement NGT guidelines in Hodal town in Palwal district
26	Sewerage scheme in left out areas & recently approved colonies in Kalanaur town and renovation of the existing 3.5 MLD STP based on MBBR technology followed by tertiary treatment and chlorination, Kalanur town in Rohtak district
27	Sewerage scheme in left out areas & recently approved colonies in Sampla town and upgradation & renovation of the existing 4 MLD STP based on MBBR technology followed by tertiary treatment in Sampla town in Rohtak district
28	Modification of existing STP with Tertiary Treatment, Effluent Disposal from STP Sohna to Nuh Drain and Laying of Sewerage System for Balance approved colonies as well as taping of drains of Sohna town
29	Providing sewerage system in left out approved colonies of Beri town and construction of 2.6 MLD STP based on SBR technology followed by chlorination in place of existing 2 MLD STP based on water stabilization pond complete in all respect at Beri in Jhajjar district
UHBVN	
30	Strengthening of Sub-transmission & distribution network including metering in Jhajjar, Rohtak, Panipat & Sonipat Circles of Haryana (under IPDS) by UHBVN
Civil Aviation Department	
31	Phase-II - Development of Integrated Aviation Hub, Hisar
Uttar Pradesh Sub Region	
NMRC	
32	Project of Metro connection between Noida and Greater Noida (29.707 km)
GNIDA	
33	Raw Water Conveyance Main from Intake at Dehra (Ghaziabad) to WTP site at Palla (Greater Noida) Clear Water Main from WTP site to Master Reservoir
34	Primary Treatment Works at Dehra (Ghaziabad), 210 MLD Water Treatment Plant at Palla (Greater Noida) and Allied Works
Rajasthan Sub Region	
PHED Rajasthan	
35	Alwar Water Supply Upgradation Project
36	Tijara Water Supply Upgradation Project
37	Rajgarh Water Supply Upgradation Project
38	Behror Water Supply Upgradation Project
39	Bhiwadi Water Supply Improvement Project
40	Reorganization of Urban Water Supply Scheme Khairthal, Alwar District from PHED, Rajasthan
PWD, Rajasthan	
41	Upgradation Strengthening & Development work on Barod to Shahjhanpur Road C.C. in VILLAGE PORTION Km 0/0 to 9/900 , 10/750 to 14/600 & 15/400 to 16/400 (MDR-206)
42	Upgradation Strengthening & Development Reconstruction work on NH-8 to Pahadi Km 0/0 to 11/100)
43	Upgradation Strengthening & Development & Re-Construction work on Behror to Bhumarika Road Km 0/0 to 12/0
44	Upgradation , Strengthening and development work of Harsoli-Ramnagar- Mirka- Baskripalnagar -Kishangarhbas- Mothuka-Thanaghauda- Mubarikpur road
45	Upgradation Strengthening & Development & Re-Construction work on Tatarpur Chouraha- Sheopur Khanpur Ahir Jat Bhagola Alipur Road Km 0/0 to 36/500
46	Padisal -Jagta Basai- Ratta Khurd- Balan Basai-Shyamka-Ismailpur- Ganj- Kishangarhbas road
47	Development work of Pratapgarh-Ajabgarh-Burja Tiraya Road Km 0/0 to 25/0 (SH-77)
48	Upgradation of Road (3.75 Mtr. To 7.00 Mtr. Carriageway) From Alwar to Matsya University at Haldeena Via Madanpuri Bhajeet Nangla Charan



S.No.	Name of the Projects
49	Upgradation Strengthening & Development work on Various Road in Alwar City
50	Strengthening, widening & upgradation from 3.0 Mtrs to 7.0 Mtrs from Km 0/0 to 7/0 (Govindgarh to Shemla khurd)
51	Strengthening, widening & upgradation from 3.75 Mtrs to 7.0m from Km 0/0 to 12/0 (Barodameo Gandura Laxmangarh)
52	Upgradation, Strengthening and development work of Vijay Mandir Alwar to Ghatla-Padisal & Harsoli road via Khairthal road.
53	Strengthening and widening from 5.50 Mtrs to 7.0 Mtrs from Km 8/00 to 38/00 on Dausa Tehla Sariska road SH-29A
54	Upgradation, strengthening and development work on Dausa-Kundal-Gudha Katla Bandikui-Balaheri-Mandawar-Ghorsarana-Kathumar Road K.m. 74/00 to 102/00 SH-78 (old MDR-48)
55	Widening & Strengthening of existing culvert on Tehla Machari road SH 25 A Km 0/0 to 23/500
56	Strengthening and widening from 5.50 Mtrs to 7.0 Mtrs from Km 0/0 to 4/500 widening from 3.0 mtr to 7.0 mtr of 26/300 & 32/400 on Tehla Rajgarh Garhi Sawairam road SH-25A
57	Upgradation strengthening and Development work on Rohara to Bara_Bhadkol Via Reni-Machari road Km 76/0 to 90/0 (MDR-151)
58	Upgradation, Strengthening and development work of Goth Ki Chowki Bigota Road Km o/0 to 21/0
59	Upgradation, Strengthening and development work of Ghat to Rajpur Bada Via Devti Km 0/0 to 10/800
60	Upgradation, Strengthening and development work of Rajgarh to Karoth road Km 0/0 to 3/0
61	Strengthening, widening & upgradation from 3.0 Mtrs to 7.0 Mtrs from Km 0/0 to 3/0 (A/ R to Baldevgarh)
62	Strengthening, widening & upgradation from 3.0 Mtrs to 7.0 Mtrs from Km 0/0 to 2/0 (Tilwad to Tilwadi)
63	Strengthening, widening & upgradation from 3.0 Mtrs to 7.0 Mtrs from Km 0/0 to 3/500 (SH-29A to Thana)
64	Strengthening, widening & upgradation from 3.0 Mtrs to 7.0 Mtrs from Km 0/0 to 3/500 (A/R to Ghatra)
65	Strengthening, widening & upgradation from 3.0 Mtrs to 7.0 Mtrs from Km 0/0 to 3/300 (Palpur to Kankrali Rampura)
66	Strengthening, widening & upgradation from 3.0 Mtrs to 7.0 Mtrs from Km 0/0 to 1/900 (A/R to Bhangarh)
67	Strengthening, widening & upgradation from 5.5 Mtrs to 7.0 Mtrs from Km 0/0 to 2/0 (A/R to Narayani Mata Mandir)
68	Strengthening, widening & upgradation from 5.5 Mtrs to 7.0 Mtrs from Km 0/0 to 12/0 (Kherli to Udaipura)
69	Strengthening, widening & upgradation from 5.5 Mtrs to 7.0 Mtrs from Km 0/0 to 12/0 (Kherli to Bhanokhar)
70	Development work of Alanpur-Bansur-Pratapgarh-Dhola Tala road km 25/0 to 70/0 (SH-52)
71	Upgradation, strengthening and development work on Ramgarh-Govindgarh-Sikari Nagar Road SH-45 K.m. 8/825 to 27/745 (Chidwai-Govindgarh upto Distt Border Section)
72	Development of Thanagazi Pratapgarh Dhola Tala road Km 99/0 to 120/200
73	Upgradation, strengthening and development work on Natni Ka Bara Malakhara-Laxmangarh Kathumar Road (including Kathumar Bye pass Km 0/0 to 1/400) Km 25/0 to 61/0 SH-44 (Chimravali- Maujpur -Laxmangarh -Khudiyana Bareda Kathumar Section
74	Upgradation, strengthening and development work on Mahuwa-Mandawar-Garhi-Sawai Ram-Laxmangarh-Govindgarh Road SH-35 Km 60/000 to 70/0 (Laxmangarh - Jaluki -Govindgarh Section)
75	Upgradation strengthening and Development work on Harsoli- Bibirani- Kotkasim- Budhibawal- Tapukra road Km 45/0 to 57/200, 62/900 to 64/500 & 74/0 to 76/200
76	Upgradation , Strengthening and development work of Kotkasim Ladpur-Tijara Firojpur Jhirka District Border Km 6/0 to 40/0
77	Upgradation , Strengthening and development work of Alipur -Khedi- Khanpur Dagrani- Pur- Nimlaka- Kalgaon- Hingwaheda -Tizara-Firozpur -Jhirka road
78	Upgradation Strengthening & Development & Re-Construction work on Tapukara to Milakpur Km 0/0 to 7/500
RRVPN LTD.	
79	New transmission projects in Rajasthan Sub Region of NCR-New proposal for funding 132 KV GSS Bahadurpur, Telco Circle and Khairthal in Alwar District
80	New transmission Projects in Rajasthan Sub Region of NCR – Construction of Sub-Station at Karoli District Alwar and Station at Sikri (Jai Shri) District Bharatpur
	Delhi Sub Region
EDMC	
81	Construction of Multi-storied office building at Karkardooma Institutional area at Shahdara South Zone by EDMC
Counter Magnet Areas	
	Projects in Madhya Pradesh - CMA Town SADA Gwalior
	SADA, Gwalior



S.No.	Name of the Projects
82	Infrastructure Development of Residential Schemes in SADA, Gwalior
	Gwalior Municipal Corporation
83	Development of Water Supply Scheme for Gwalior City
	Projects in Rajasthan - CMA Town Jaipur
	Jaipur Development Authority
84	Rejuvenation of Amanishah Nallah (Dravyavati River) including Area Development in Jaipur City, JDA
85	Construction of 6 lane ROB with Limited Height Subway (LHS) including Electrification work at L/C-211, Goner road, Dantli on JP-DLI Railway line in Jaipur
86	Construction of 3 lane ROB parallel to existing Jhotwara ROB from Panchayat Bhawan/SBBJ Bank to Ambabari T-Junction, Jaipur
87	Construction of 6 lane ROB in lieu of LC-70. Sitapura on JP-SWM Railway line
88	Construction of 4 lane ROB with LHS in lieu of LC-200, Bassi Town, Jaipur
89	Construction of 4 lane ROB in lieu of LC-102/2E, Jahota on Jaipur to Sikar Railway Line, Jaipur
90	Construction of Elevated Road from Sodala Tri-junction to LIC Office near Ambedkar Circle, Jaipur by JDA
	Projects in Punjab - CMA Town Patiala
	Patiala Urban Development Authority
91	Rejuvenation of Badi Nadi & Chotti Nadi, Construction of STP's & ETP and Laying of Sewerage Network, at Patiala on EPC basis

Table D-1.4.1.3: State-wise/Agency-wise Completed Infrastructure projects**List of State-wise/Agency-wise Completed Infrastructure projects with loan assistance from NCRPB**

S.No.	Name of the Projects
	HARYANA
	Haryana Urban Development Authority
1	Development of residential sector 2, Faridabad
2	Residential scheme of Sector 64, Faridabad
3	Development of residential sector 38, Gurgaon
4	Residential sector 2, Sonapat
5	Residential scheme of Sector 7 & 8 (part), Sonapat
6	Development of residential sector 9 and 9A, Bahadurgarh
7	Development of residential sectors 11 & 12, Panipat
8	Development of residential sectors 13 & 17, Panipat
9	Development of residential sectors 18, Panipat
10	Development of residential sectors 24, Panipat
11	Development of residential sectors 2 & 3 (part), Rohtak
12	Development of residential sectors 2, 3 and 4 (part), Rohtak
13	Development of residential sector 2, Palwal
14	Development of Brass Market, Rewari
15	Development of residential sector 3 (part II), Rewari
16	Development of shopping centre at sector 3, Rewari
17	Development of residential sector 4, Rewari
18	Shopping Centre at sector 6, Dharuhera
19	Development of residential sectors 4 & 7, Gurgaon
20	Development of residential sectors 32 and part sector 39, Gurgaon
21	Development of residential sector 40, Gurgaon
22	Development of residential sector 39, Gurgaon
23	Development of industrial sector 59, Faridabad
24	Development of industrial sector 58, Faridabad



S.No.	Name of the Projects
25	Development of Sectors 15 (industrial), 18, 19 and 20 at Gurgaon
26	Development of industrial sector 25 (phase II) for informal sector, Panipat
27	Development of industrial sector 7, Panipat
28	Development of Sector-2 (Resd.) at Bahadurgarh
29	Development of Sector-62 (Residential) at Faridabad
30	Development of Sector-65, Faridabad
31	Development of Sector-27, Gurgaon
32	Development of Sector-28, Gurgaon
33	Development of Sector-44/47 (Resd.) at Faridabad
34	Widening/ re-alignment of Badkhal - Surajkund road starting from Ankhir Chowk to Prahladpur (Delhi border), Faridabad
35	Construction of external link road connecting with sector 17, Gurgaon
36	Widening & strengthening of existing Mehrauli road from National Highway 8 to Gurgaon - Delhi border, Gurgaon side
37	Widening & strengthening of Old Delhi Road from Dundahera border to National Highway 8, from Atul Kataria Chowk to Mahavir Chowk and from Mahavir Chowk upto Management Development Institute, Gurgaon
38	Construction of Transport Nagar at Panipat
39	Augmentation of Water Supply of Faridabad (HUDA Sectors) by HUDA
40	Construction of second phase of main waterworks comprising of one treatment plant of capacity 20 MGD, storage and sedimentation tank and clear water tank near village Basai, Gurgaon
41	Providing Master Water Supply Scheme of distribution main Zone-3 (Ph-III) Urban Estate, Gurgaon
42	Providing Master Sewerage Scheme for Trunk Sewer No. 4 Urban Estate, Gurgaon
43	Construction of 200 bedded hospital in Sector-10, Gurgaon (Phase-I)
	Haryana State Industrial & Infrastructure Development Corporation
44	Development of Growth Centre, Bawal
45	Development of Industrial Model Township Phase-I at Manesar
46	Industrial Estate, Barhi (Gannaur)
47	Development of Industrial Estate, Ph. IV at Kundli
48	Development of Industrial Zone Sector 34-35, Gurgaon, Haryana
49	Development of access controlled Kundli-Manesar-Palwal Expressway section (Manesar RD 83.320 to Palwal RD. 135.650 km) by HSIIDC, Haryana (balance works)
50	Providing water supply and sewerage for Phases II, III and IV Industrial Model Township Manesar, Gurgaon
	Municipal Corporation of Faridabad (MCF)
51	Urban Renewal Project at Deuba Colony, Faridabad
52	Urban Renewal Project at Bapu Nagar, Faridabad
53	Augmentation of water supply at sectors serviced by Municipal Corporation
54	Revamping of Sewerage System and Sewage Treatment Works in Faridabad, Haryana
55	Infrastructure Development Works (Drainage) in Old Faridabad Zone, Faridabad
56	Integrated Solid Waste Management Project, Faridabad
	PWD (B&R), Haryana
57	Upgradation of Roads in the NCR - Haryana
58	Construction of Road from Northern Bye-pass Rohtak to NH-71 (to be used as slip road), in Rohtak district
59	Widening and strengthening of road from NH-71 to NH-10 via Singhpura Kalan to Singhpura Khurd, Bahujamalpur in Rohtak district
60	Construction of 2 lane Road Over Bridge in lieu of level crossing No. 45-A/T-3 at Km. 60/6-7 near Hailly Mandi Kulana Road East cabin on Delhi- Rewari Section
61	Construction of 2 lane Road Over Bridge in lieu of level crossing No. 25B at Km. 31/8-9 on Delhi Rewari Railway Line on Gurgaon Daulatabad Section
62	Construction of 2 lane Road Over Bridge in lieu of level crossing No. 28 on Delhi Rewari Section at crossing of Gurgaon Farrukh Nagar Jhajjar road at Gurgaon.



S.No.	Name of the Projects
63	Construction of two lane ROB at I.C no. 58B on Delhi- Bhatinda Railway line and 1B on Rohtak Gohana Panipat ' Railway Line at RD 1.20 km of circular road, Rohtak
64	Construction of 4 lane RoB at level crossing No. 61A on Delhi- Bhatinda Railway line at Rd. 89.7 Km of Rohtak- Bhiwani road
65	Construction of 2 lanes RoB at level crossing no. 59A on Delhi-Bhatinda railway line at Rohtak
66	Construction of Bypass in Kharkhoda in Sonapat district
67	Construction of 2 lanes ROB at Bahadurgarh on L.C No. 23-C in Km 29/2-3 on Delhi Bhatinda Railway line crossing Bahadurgarh Nahara Road in Jhajjar District
68	Improvement of Jahazgarh Chhuchhakwas Dadri Road (SH20)(Km 73.100 to Km 95.150)
69	Improvement of Gurgaon Farrukhnagar Jhajjar Road (SH 15A) (Km 5.5to km 45.25)
70	Improvement of Rohtak kharkhoda Delhi Road (SH 18) (Km 10.2 to km 40.76)
71	Project for widening and Strengthening to 10 Mtr. of Hodal Nuh Pataudi Patauda road km. 0 to 96.20 up NH-71 (MDR No. 132) in Palwal, Mewat, Gurgaon and Rewari District.
72	Four laning, widening and strengthening of Gurgaon – Nuh – Rajasthan Border (SH-13)(Km 7+200 to 95+890)
73	Improvement of Sampla Jhajjar Road (SH 20) (Km 44.12 to km 65.46)
74	Improvement of Sonapat kharkhoda Sampla Road (SH 20) (Km 10.125 to km 43.4)
75	Widening and Up gradation of Rai Nahra Bahadurgarh Road (MDR 138) (Km 0.00 to 37.3960)
76	Improvement (4 laning) of Murthal Sonipat Road (SH 20) (Km 0.0 to km 10.125)
77	Improvement of Punhana to Jorhera Road Km. 0.00 to Km. 6.780 in Mewat Distt., Haryana.
78	Improvement of MAM NH 10 road by providing widening of carriageway, footpath and drainage from Km 70.100 to 79.200 in MC limit Rohtak
79	Two land ROB at Railway crossing no. 19-C on Subana Kosli Nahar Kanina road near Kosli Railway Station at Rewari Hisar Bhatinda Railway line km. 28 1/2 in Rewari District.
80	Proposed 2 lane ROB at level crossing no. 42 at Samalkha Chullana road at RD 1.00 km. in Panipat District
81	Improvement of roads from BKP road upto GA road
82	Improvement of roads from Palwal Hathin road to Uttawar Sikrawa to Bhadas road
83	Improvement of Hodal Punhana Nagina Road
84	Provision of Service lane and drains on Gurgaon-Nuh-Alwar Road (SH-13)
85	Improvement (Four Lanning) of Rohtak Bhiwani Road in Haryana Subregion
86	Improvement (Four Laning) of Rohtak Hissar Road from Drain No. 8 to Bahuajampur (km. 79.200 to km. 86.800) in Haryana Sub region.
87	Badli By-pass 0 to 5.68 (new construction alongwith strengthening of existing 2 km. stretch)
88	Improvement and Widening of Five Roads in Sonapat Distt. in Haryana.
89	Improvement of Other District Roads (ODRs) in Jhajjar district in Haryana Sub region.
90	Improvement by way of four laning of Jhajjar Dhaur Beri road
91	Improvement by way of four laning of Dighal Beri Jhajgarh road.
92	Project for improvement and construction of road in Jhajjar circle of NCR sub Region - Bahadurgarh Chhara Dujana Beri Kalanur road
93	Improvement of Other District Roads (ODRs) in Gurgaon district in Haryana Sub region.
94	Widening & Strengthening of Bahadurgarh Jhajjar Road in Jhajjar district of Haryana
95	New construction of roads from Kaluka to NH-8, Sheoraj Majra to Sangwari, Barriawas to NH-8, Rojka to Asadpur, Bikaner to Gurukawas, Rewari Jhajjar road to Rewari Narnaul road via Rewari Dadri road
96	Construction of By-pass at Chhara, in Jhajjar District of Haryana
97	Construction of By-Pass at Kosli, Haryana
98	Improvement of 5 Roads in Gurgaon Distt. (reduced by 10 Cr. from August)
99	Construction of 2 lane ROB at Panipat Jatal road on Delhi Ambala railway line at L/C No. 52-C in Panipat District
100	Widening & Strengthening of Gohana Lakhanmajra Bhiwani road upto district Rohtak boundary road from km. 0.000 to 37.700
101	Widening & Strengthening of UP border Sonapat Gohana upto district Sonapat boundary road from km. 11.600 to 74.000
102	Improvement by way of four laning of Rewari Kot Kasim Road upto NH-8, Shahjahanpur Rewari road upto 6 km., Rewari Narnaul Road (SH26), Rewari Mohindergarh Road, Rewari Dadri road upto proposed bypass



S.No.	Name of the Projects
103	Widening & upgradation of Gurgaon-Chandu-Badli-Bahadurgarh Road
104	Four lanning of Jhajjar Farukhnagar-Gurgaon road in Jhajjar/Gurgaon district
105	Up gradation of 3 roads in Rewari Division (Haily mandi to Pahlawas road, kosli-Guryani to Pahlawas NH-71 and Dahina-Jatusana Road
106	Construction of additional 2 lane ROB at LC no. 3 on Hisar Sadalpur Railway line crossing old DHS at RD 164.60 at Dabra Chowk, Hisar
107	Construction of Elevated Road on National Highway No 10 from Chottu ram Chowk to Old bus stand (KM 74.00 to 75.86) in Rohtak city Portion”
	PHED Haryana
108	Laying of Internal water distribution system in Rewari town, Haryana
109	Augmentation of drinking water supply for Rohtak district, Haryana
110	Augmentation of drinking water supply for Jhajjhar district, Haryana
111	Augmentation of drinking water supply for Gurgaon district (Non-Mewat), Haryana
112	Augmentation of drinking water supply for Rewari district, Haryana
113	Augmentation of drinking water supply for Sonapat district, Haryana
114	Augmentation of drinking water supply for Faridabad district, Haryana
115	Augmentation of drinking water supply for Panipat district, Haryana
116	Augmentation of Water Supply in Rohtak, Haryana
117	Augmentation of Water Supply in Palwal, Haryana
118	Augmentation of water supply in Hodal Town
119	Augmentation and Extension of Water Supply in Bahadurgarh, Dist. Jhajjar
120	Augmentation and Extension of Water Supply in Kalanaur, Dist Rohtak
121	Augmentation of water supply scheme at Sampla Town (3 Villages) in Rohtak District
122	Augmentation and extension of water supply in Meham Town, District Rohtak
123	Augmentation and Extension of Water Supply in Beri, Dist Jhajjar
124	Augmentation of drinking water supply scheme for villages Kosli, Bhakli and railway station area of Dist.Rewari @ 110 LPCD
125	Augmentation and Extension of Water Supply in Ganaur, Dist Sonipat
126	Providing distribution pipeline in various approved colonies of Sonapat town in District Sonapat
127	Augmentation of water supply in Gohana Town
128	Augmentation and Extension of Water Supply in Kharkhoda town,Dist.Sonapat
129	Ind water works newly developed area in wester side of Rewari town, dist. Rewari
130	Augmentation of rural drinking water supply for Mewat region- Phase- I, Haryana, revised in nov 09
131	Providing Water Supply Scheme for Samalkha town Distt. Panipat.
132	Water Suply at Sohna Town & Rojka Meo Industrial Area,Sohna
133	Water Supply scheme for Nalhar Medical College and Nuh Town
134	Augmentation of Water Supply for Pataudi and adjoining town of Haily Mandi along with surrrounding seven villages.
135	Augmentation of Water Supply for Farrukh Nagar Town & Five Villages, Gurgaon District.
136	Augmentation & Extension of Water Supply and Sewerage facilities in various towns of Haryana[8 projects included]
137	Providing sewerage system to new approved colonies in Gohana Town, Dist Sonipat, Haryana
138	Providing sewerage facilities in Palwal, Haryana
139	Providing sewerage system for new colonies in Hodal Town, Haryana
140	Augmentation and Extension of Sewerage Scheme in Sohna town, Haryana
141	Extension of Sewerage System in new colonies of Panipat town
142	Providing sewerage scheme & Treatment Plant for Sampla Town,Dist.Rohtak
143	Extension of sewerage system and treatment of sewage in Kalanaur, Rohtak District
144	Extension of sewerage system and treatment of sewage in Beri, Dist Jhajjar
145	Extension of sewerage scheme and treatment of sewage in Meham Town , District Rohtak



S.No.	Name of the Projects
146	Providing Sewerage facilities in Rewari Town, Haryana
147	Extension of sewerage system and treatment of sewage in Bahdurgarh, Dist Jhajjar
148	Providing sewerage scheme for various colonies in Sonapat Town
149	Providing sewerage system and STP for Samalkha Town, Haryana
150	Providing sewerage scheme & Treatment Plant for KharkhodaTown,Dist.Sonepat
151	Extension of sewerage system and treatment of sewage in Ganaur, Dist Sonepat
152	Extension of sewerage system and treatment of sewage in Bawal, Dist Rewari
153	Providing sewerage scheme and treatment plant for Nuh Town, Mewat District
154	Providing sewerage scheme and Treatment Plant for Gohana Town District Sonapat
155	Construction of Storm Water Drain in Sonepat Town, Haryana
156	Providing sewerage scheme for Punhana Town in Mewat Distt.
157	Providing sewerage scheme and treatment plant for Pataudi Town, Gurgaon District
158	Providing sewerage scheme and treatment plant for Hathin Town, Palwal District
159	Development of Sewerage System and Construction of two STPs at Rohtak town.
160	Providing sewerage facilities in village kosli, Bhakli and Railway station area of Kosli, Dist. Rewari
	PWD (Irrigation), GoH
161	Scheme for Construction of NCR Water Supply Channel in Haryana
	Haryana Slum Clearance Board
162	Solid Waste Disposal & Repair of Roads in 16 Towns, Haryana
163	Strengthening of Municipal Fire Services in 16 Towns,Haryana
164	Shifting of Milk Dairies from municipal limits in 6 Towns, Haryana
	Haryana Vidyut Prasaran Nigam
165	Creation of power infrastructure in Gurgaon & Bahadurgh, Haryana
166	Reinforcement of Power infrastructure in Gurgaon and Rewari districts
167	Project for creating power infrastructure in Haryana subregion of NCR
168	Scheme for strengthening power infrastructure in NCR area of Haryana – Augmentation of Transmission Works,
	Dakshin Haryana Bijli Vitran Nigam
169	Strengthening and Upgradation of Sub-transmission & Distribution Network ,Gurgaon
170	Strengthening of sub-transmission and distribution network, Bawal, Dharuhera, Pali (Gothra), Buroli, Kosli and Rewari (District Rewari)
171	Strengthening of sub-transmission and distribution network, Sohna, Nuh, Ferozepur Jhirka, Taoru, Manesar, Pataudi, Farukhnagar & Badshahpur (distt.Gurgaon)
172	Scheme for HVDS/LVDS & Reallocation of meters under DHBVN in NCR area
	Uttar Haryana Bijli Vitran Nigam
173	Strengthening of Transmission & Distribution Network in Rohtak Circle by Uttar Haryana Bijli Vitran Nigam Ltd.
174	Loss Minimisation and Strengthening of Distribution system being fed from 132 KV substation Khokhrakot Rohtak, kalanaur and Sampala under SE 'OP' Circle, UHBVNL, Rohtak by proposing 6 no. 33KV sub stations
175	Scheme to set up five(5) sub stations with capacity of 33Kv at Bal Bhawan (rohtak), Trtauli, Kharawar, Sampla Road (Jhajjar) and Dubaldhan
	DTETechnical education, GoH
176	Establishment of Polytechnic at Sampla, Rohtak District, Haryana
177	Establishment of Technical Institutions at Rohtak
	Health Dept., Haryana
178	Construction of Medical College with Teaching Hospital at District Mewat, Haryana
	RAJASTHAN
	Urban Improvement Trust Alwar
179	Commercial complex scheme, Alwar



S.No.	Name of the Projects
180	Surya Nagar residential scheme
181	Ambedkar Nagar residential scheme, Alwar
182	Commercial complex at Kedal Ganj and relocation of veterinary hospital, Alwar
183	Integrated development of Jawahar Nagar, Chandra, Chitrakoot, Vasundhara and Patel Nagar residential schemes, Bhiwadi
184	Bhagat Singh residential and commercial scheme at Bhiwadi
185	Commercial complex scheme at Shivaji Park, Alwar
186	Development of Hasan Khan Mewati Nagar residential scheme, Alwar
187	Development of residential scheme of Budh Vihar (Vijay Nagar extension), Alwar
188	Residential Scheme of Vaishali Nagar
189	Warehousing & Godown Scheme
190	Transport Nagar scheme part 'B', Alwar
191	Construction of railroad overbridge, Alwar
192	Construction of truck terminal, Alwar
	RIICO
193	Matsya Industrial Area, Alwar
194	Development of Industrial township, phase III, Bhiwadi
195	Development of Khushkhera industrial area, Bhiwadi
196	Development of special complex at Bhiwadi
197	Development of industrial area, Chopanki
198	Development of industrial area, Neemrana
199	Jindoli Ghati Bypass Tunnel, Alwar - Bharatpur road, district Alwar
200	Development and construction of 9 km stretch of Dharuhera Bhiwadi road
	Rajasthan Rajya Vidyut Prasaran Nigam Ltd.
201	Transmission Project of RVPN pertaining to the Rajasthan Sub Region of NCR.
202	220 KV GSS Khushkhera and LILO of 220kv Neemrana-Bhiwadi (PG) line at khushkhera, Alwar.
203	EHV Transmission Schemes in NCR area of Rajasthan i.e. Alwar Distt. (including 6 Nos. of schemes)
	JVVNL
204	Feeder Renovation of 55 Nos. 11 KV feeders of Alwar Circle, Rajasthan Sub Region
205	Scheme for creation of 29 nos. 33/11 KV Sub Station in Alwar Circle, Rajasthan Sub Region
	PHED Rajasthan
206	Reorganization of Urban Water Supply Scheme Kishangarh Bas, Alwar District from PHED, Rajasthan
	UTTAR PRADESH
	Ghaziabad Development Authority
207	Improvement of drainage network, Ghaziabad
208	Development of Six lane Elevated Road (Hindon) in Ghaziabad, Uttar Pradesh by GDA
209	Augmentation of water supply of trans-Hindon area by carriage of 50 cusecs of water from Upper Ganga canal
	Nagar Nigam, Meerut
210	Sewage rehabilitation scheme
211	Improvement of drainage network
212	Improvement of supplementary drainage network
213	Improvement of road network
214	Improvement & Development of Water Supply in newly developed areas of Meerut City
	Nagar Nigam Ghaziabad
215	Improvement of drainage system (Nagar Nigam area)
216	Improvement of street lights



S.No.	Name of the Projects
217	Improvement or road network, Ghaziabad
218	Improvement of water supply scheme/ system in trans-Hindon area, Ghaziabad
219	Improvement of water supply scheme/ system in cis-Hindon area, Ghaziabad
220	Improvement of existing water supply system
	GNIDA
221	Construction of 20 MLD Sewage Treatment Plant and Pumping Station at Ecotech-III, Greater Noida
222	Construction of 15 MLD Sewage Treatment Plant and Pumping Station at Ecotech-II, Greater Noida
223	Internal development of residential sector Delta - I
224	Internal development of residential sector Delta - II
225	Internal development of residential sector Delta - III
226	Internal development of residential scheme of Swarna Nagari
227	Infrastructure development scheme of Greater NOIDA
228	Development of Toy City industrial scheme at Surajpur
229	Development of Udyog Vihar industrial scheme
230	NOIDA - Greater NOIDA expressway
231	Development of Integrated Indl.Township, Tronica City, Loni
	UP Housing Development Board
232	Vasundhara residential infrastructure development scheme, Ghaziabad
233	Commercial complex scheme at Garhmukteshwar road, Meerut
234	Scheme no. 6 (Residential scheme between Meerut and Garhmukteshwar road, in front of Medical College)
235	Residential scheme between Meerut - Hapur and Meerut - Garhmukteshwar road, Meerut
236	Residential and commercial scheme between Meerut and Hapur road
	Meerut Development Authority
237	Development of Begum Bagh bridge area, Meerut
238	Development of residential scheme of Pallavpuram, Meerut
239	Hathkargha Nagar (Lohia Nagar) work-cum-shelter scheme, Meerut
240	Scissors manufacturing work-cum-shelter scheme, Meerut
241	Sports goods manufacturing and trading complex, Meerut
242	Development of residential scheme of Shatabdi Nagar sector 4(c), Meerut
243	Scheme for marketability of assets created by Meerut Development Authority
244	Residential scheme of Shatabdi Nagar (sectors 2, 4B, 5, 6 & 8)
245	Shatabdi Nagar new township development scheme
246	Development of Vedvyaspuri residential scheme, Meerut
247	Industrial development scheme at Udyogpuram, Meerut
248	Ganga Nagar Residential scheme Phase III
	Hapur Pilkhua Development Authority
249	Residential scheme of Preet Vihar
250	Anand Vihar Housing Scheme at Hapur
	Bulandshahr Khurja Development Authority
251	Development of Lal Taalab commercial scheme, Bulandshahr
252	Development of Raichandi commercial scheme, Khurja
253	Yamunapuram Office cum commercial complex, Bulandshahr
254	Yamunapuram residential scheme, phase II, Bulandshahr
255	Development of commercial complex, Harishchandra Vikas Kendra, Bulandshahr
256	Kalindi Kunj residential scheme, Bulandshahr, UP
257	Ganga Nagar residential scheme, Bulandshahr



S.No.	Name of the Projects
	U.P. Power Corporation Ltd.
258	Strengthening of Transmission & Distribution Network of Meerut Division by UPPCL
	DELHI
	Municipal Corporation Delhi
259	Establishment of Abbatoir and Rendering Plant, Ghazipur
260	Construction of MCD Office and Civic Centre, New Delhi
	COUNTER MAGENT AREAS
	SADA, Gwalior
261	Water Supply Scheme for Gwalior, Madhya Pradesh
262	Development of Integrated Township in Gwalior
263	Construction of 132 kV sub-station, Gwalior
264	Construction of 6 lane Arterial Road in CMA Gwalior, by SADA Gwalior
	PUPDA/ Improvement Trust, Patiala
265	Development of Sewa Singh Tikri Wala Nagar and Extension of Karhari Farm, Urban Estate, Patiala
	Patiala Urban Development Authority
266	Extension & Augmentation of Water Supply, Sewerage & Solid Waste Mgmt, Patiala
	Urban Improvement Turst, Kota
267	Construction of Inetgrated township at Srinathpuram, Kota
268	Augmentation of Water Supply in Kota, Rajasthan
	Rajasthan Rajya Vidyut Prasaran Nigam Ltd.
269	Kota Thermal Power Station(KTPS) extn unit 7, stage V(1x195 MW) Coal, Based Power Project
	Jaipur Development Authority
270	Construction of RUB on Jaipur-Sikar Railway Line near Bridge No.107 to connect Anand lok and Swapan Lok JDA Schemes, Jaipur
	Bareilly Development Authority
271	Residential and Transport Nagar schemes, Bareilly
272	Ram Ganga Nagar residential scheme in Bareilly
	PHED Haryana
273	Augmentation & Extension of Water Supply/Sewerage Scheme in Hissar
	Haryana Power Genration Corporation Ltd.
274	Setting up of a coal based Thermal Power Project under stage I for 1200 MW (2 x 600 MW) in Hisar District, Haryana
	Dakshin Haryana Bijli Vitran Nigam
275	Improvement & Upgradation of Sub transmission of distribution network in Hisar



Annexure-D-1.5

STAKEHOLDER CONSULTATIONS FOR REGIONAL PLAN PREPARATION

- A) Inaugural Conclave for Future Ready NCR was held on 10.10.2019 in Vigyan Bhawan.
- B) Further, 17 Full day Stakeholders Workshop were organised during December, 2019 and January, 2020, as per the schedule given in Table D-1.5.1.

Table D-1.5.1: Schedule of sector-wise workshops organised by NCRPB for preparation of Regional Plan-2041 for NCR

(Timing 10:00 AM to 05:30 PM)

Date	Sector
03.12.19 (Tuesday)	Transport and Mobility
05.12.19 (Thursday)	Power and Energy
09.12.19 (Monday)	Water and Drainage
11.12.19 (Wednesday)	Sanitation and Comprehensive Waste Management
13.12.19 (Friday)	Environment and Disaster Management
16.12.19 (Monday)	Agriculture
18.12.19 (Wednesday)	Rural Development
20.12.19 (Friday)	Health
03.01.20 (Friday)	Education
06.01.20 (Monday)	Tourism and Heritage
08.01.20 (Wednesday)	Economic Growth and Income Generation
10.01.20 (Friday)	Sports, Skills and Social support system
13.01.20 (Monday)	Safety and Security
16.01.20 (Thursday)	Digital Technology and Platforms
20.01.20 (Monday)	Citizen Centric Planning
22.01.20 (Wednesday)	Housing Infrastructure and Zoning Regulations
24.01.20 (Friday)	Implementation Strategies

C) Key Speakers and Participants

Each of the workshops had dedicated session for all the 4 NCR States participants for presenting their views on the subject. The workshops had very senior level participants from Center and State Government Ministries, knowledge partners, sector experts, NGOs, District Level functionaries etc. Knowledge partners invitees included KPMG, WWF, OMIDYAR, BCG, iSPIRT amongst others. Apart from these, there were representations from DCs, DMs, ZilaParishads, Panchayats, ADM, ADCs, NGOs as well.

- 1. TRANSPORT AND MOBILITY :** Shri Amit Ghosh, Joint Secretary, MoRTH, ; Shri A.K. Singh, Principal Secretary, T&CP Dept. Govt. of Haryana ; Shri V. K. Singh, Managing Director, National Capital Region Transport Corporation; Smt. Usha Padhee, Joint Secretary, M/o Civil Aviation & CMD, Pawan Hans Ltd, Shri AnantSwarup, Joint Secretary (Logistics), Deptt. of Commerce, Shri Abhishek Chaudhary, Vice President, Delhi-Mumbai Industrial Corridor (DMIC), Shri Amit Kumar Jain, General Manger (Operations), CRIS, Railway Board; Shri M.V. Subramanian, General Manager (Planning), Delhi International Airport Limited; Shri AbhayDamle, Joint Secretary, Ministry of Roads, transport and Highways; Shri Gangwar, Member Technical, Inland Waterways Authority of India; Dr.Mangu Singh, Managing Director, Delhi Metro Rail Corporation; Shri S.K. Lohia, Managing Director & Chief Executive Officer, Indian Railway Stations Development Corporation Limited; Shri Kal Singh, DDG (TRW), Ministry of Roads, transport and Highways
- 2. POWER AND ENERGY:** Shri Praveen Kumar, Special Secretary, Ministry of New and Renewable Energy; Shri. Sudhir Kumar Rahate, Additional Secretary, Ministry of Power; Shri Mrityunjay Narain, Joint Secretary, Ministry of Power; Shri K.V.S. Baba, CMD, Power Systems Corporation of India (POSOCO); Shri AbhayBakre,



Director General, Bureau of Energy Efficiency, Ministry of Power; Shri Sushanta Chatterjee, Chief (Regulatory Affairs), Central Electricity Regulatory Commission ; Shri M. Devraj, Managing Director, Uttar Pradesh Power Corporation Ltd. (UPPCL)

3. **WATER & DRAINAGE:** Shri A.B. Pandya, Secretary General, International Commission on Irrigation and Drainage (ICID); Shri Niteshwar Kumar, Joint Secretary, Department of Water Resources. Ministry of Jal Shakti; Shri Muralidharan, Dy. Advisor, Jal Jeevan Mission ; Shri Nikhil Kumar, Chief Executive Officer, Delhi Jal Board; Shri K.C. Naik, Chairman, Central Ground Water Board; Prof. Ashwini Kumar Gosain ,Ex professor -IIT Delhi; Shri Musood Husain, Ex-Chairman, Central Water Commission; Shri A D Mohile, Ex-Chairman, Central Water Commission; Dr. Sushil Gupta, Ex-Chairman, Central Ground Water Board; Shri Avinash Mishra, Advisor, Water Resources, NITI Ayog;
4. **SANITATION AND COMPREHENSIVE WASTE MANAGEMENT:** Shri Arun Baroka, Additional Secretary, Ministry of Jal Shakti; Shri. V K Jindal, Joint Secretary, Swachh Bharat Mission, Ministry of Housing and Urban Affairs; Smt. D Thara, JS, AMRUT, Ministry of Housing and Urban Affairs; Shri Ajay Mathur, Director General, The Energy and Resources Institute; Ms. Manisha Saxena, Secretary, Urban Development, GNCT Delhi; Shri Sanjeev Goel, Sr. Principal Scientist and Head, CSIR NEERI Delhi; Ms. Almitra Patel, Solid Waste Management Expert; Ex.Prof. Subir Paul, IIT, Kharagpur;
5. **ENVIRONMENT AND DISASTER MANAGEMENT:** Shri A K Mohanty, Joint Secretary, The Ministry of Environment, Forest and Climate Change (MoEFCC); Mrs. Bharati, Joint Secretary, Ministry of Environment Forest & Climate Change ; Shri S.P. Singh Parihar, Chairman, Central Pollution Control Board (CPCB); Shri Kamal Kishore, Member, National Disaster Management Authority (NDMA); Major General S K Jindal, ED, National Institute of Disaster Management ; Shri D.K. Shami Chief Fire Advisor, Ministry of Home Affairs ; Dr. M Mahapatra, Director General, India Meteorological Department (IMD); Dr. Y.V. Singh, Principal Scientist, The Indian Agricultural Research Institute (IARI); Shri Ashish Agnihotri, PHD Chamber of Commerce and Industry (PHDCCI)
6. **AGRICULTURE:** Shri Atul Chaturvedi, Secretary, Department of Animal Husbandry & Dairying (GoI); Smt. Vasudha Mishra, Special Secretary, Ministry of Agriculture and Farmers Welfare; Shri P.K. Swain Joint Secretary, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare ; Dr. Sunil Kumar Gulati, Add Chief Secretary, Deptt. Of Animal Husbandry and Dairying, Govt of Haryana; Dr. S.K. Malhotra, Commissioner, Department of Agriculture Cooperation; Dr. B.N. Srinivasa Murthy, Commissioner, Horticulture, Ministry of Agriculture and Farmers Welfare; Shri Pawanesh Kohli, Chief Advisor and CEO, National Centre for Cold-chain Development (NCCD); Shri Avinash Verma Director General, ISMA; Shri Sanjiv Chadha, Chairman, National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED); Dr. Sudhanshu, Secretary, Agricultural and Processed Food Products Export Development Authority (APEDA); Shri Paban K. Borthakur, CMD, Agricultural and Processed Food Products Export Development Authority (APEDA); Dr. Rohan Jain, GCMF (AMUL)
7. **RURAL DEVELOPMENT:** Smt. Alka Upadhyay, Additional Secretary, Ministry of Rural Development; Shri Rohit Kumar, Joint Secretary, Ministry of Rural Development; Smt. Leena Johri, Joint Secretary, Ministry of Rural Development ; Sh. Sushil Sarwan, Director, Development and Panchayats Department, Govt of Haryana ; Philip Mathew, Expert, United nation Development Program; Prof. Murugesan, National Institute of Rural Development
8. **HEALTH :** Smt. Preeti Pant, Joint Secretary, National Urban Health Mission, Ministry of Health and Family Welfare; Shri Praveen Gedam, Dy. CEO, Ayushman Bharat ; Shri Vikas Sheel, Joint Secretary, Ministry of Health & Family Welfare, Govt. of India ; Dr. S B Kamboj, Director General Health, on behalf of Shri Rajeev Arora, Additional Chief Secretary, Health, Govt. of Haryana ; Dr S K Raheja, Director General (Health), GNCTD and Medical Superintendent, G B Pant Hospital, Delhi ; Shri Manish Chaturvedi, Professor, National Institute of Health & Family Welfare; Dr. Vijay Agarwal, President, Consortium of Accredited Health Care Organisation ; Dr Ved Prakash, Indian Council of Medical Research (ICMR); Red Cross Society of India
9. **EDUCATION:** Prof. Anil D. Sahasrabudhe, Chairman, All India Council for Technical Education (AICTE); Prof. Biswajit Saha, Director, Central Board of Secondary Education (CBSE); Renu Batra, Additional Secretary,



University Grants Commission (UGC); Shri Ankur Gupta, Principal Secretary, Higher Education, Govt. of Haryana ; Shri Sridhar Srivastava, Dean, National Council of Educational Research and Training (NCERT); IIT, Delhi & Roorkee; Dr. Alka Muddgal, Head Amity Institute of Education; Smt. Shobha Mishra Ghosh, Asstt. Secretary General, FICCI; Ms. Rupamanjari Ghosh, Vice-Chancellor of Shiv Nadar University, Uttar Pradesh; Prof. B.K. Patnaik, Director, School of Extension and Development Studies (SOEDS), Indira Gandhi National Open University (IGNOU); SEPT Ahmedabad

- 10. TOURISM & HERITAGE:** Smt. Meenakshi Sharma, Director General, Ministry of Tourism; Shri Kamal Vardhan Rao, Chairman, India Tourism Development Corporation (ITDC); Smt. Nirupama Y. Modwel, Principal Director, INTACH; Smt. Rupinder Brar, Additional DG, Ministry of Tourism ASI; Ms. Bharti Sharma, Asst. Director General, Ministry of Tourism; Shri Ashok Khemka, Principal Secretary, Govt. of Haryana; Shri Vivek Sagar, Head Development Tourism, Hospitality Skill Council ; Smt. Rajni Hasija, Director, Indian Railway Catering And Tourism Corporation Limited; Shri Shiv Pal Singh, Special Secretary, Tourism Govt. of UP
- 11. ECONOMIC GROWTH AND INCOME GENERATION :** Shri R.M. Mishra, Special Secretary, Ministry of Micro, Small & Medium Enterprises; Shri Sajeev Sanyal, Principal Economic Adviser, Department of Economics Affairs ; Shri Hardeep Singh, Addl. Director General, Foreign Trade, M/o. Commerce & Industry ; Dr. S.P. Sharma, Sr. Director, PHD Chamber of Commerce and Industry (PHDCCI); KVIC; Shri Sugata Sen, Deputy Director General , Society of Indian Automobile Manufacturers (SIAM) ; Ms. Swati Aggarwal, Director, PricewaterhouseCoopers Pvt Ltd (PwC); Shri Mohit Bhasin, Partner, KPMG ; Shri Ravi Chauhan, Jones Lang LaSalle (JLL)
- 12. SPORTS, SKILLS AND SOCIAL SECURITY SYSTEM:** Dr. Savant Bhaskar Atmaram, Principal secretary in Deptt of Urban Development and Housing, Govt. Of Rajasthan and Secretary Sports and Youth Affairs, Govt. Of Rajasthan ,Ms. Juthika Patankar, Additional Secretary, Ministry of Skill Development & Entrepreneurship; Shri Manish Kumar, MD, National Skill Development Council; Smt. Sunita Sanghi, Senior Adviser, Ministry of Skill Development and Entrepreneurship ; Dr. Imtiaz Ahmed, Mission Director (Age Care), HelpAge India; Heads and CEO of NCR relevant sectors of Skill Councils; Senior cricketers including Chetan Sharma, Vijay Yadav; Shri Rajesh Singh, DDG, Rural Business, Deptt. of Posts
- 13. SAFETY AND SECURITY:** Dr. Sanjay Bahl, Director General, Cert-In; Shri S.K. Bhalla, DG, ICCC & Director, Ministry of Home Affairs; Shri Ram Phal Pawar, Director, National Crime Records Bureau (NCRB); Smt. Rama Vedashree, Chief Executive Officer, Data Security Council of India (DSCI); Smt. Leenika Khattar, Northern Region Head, National Association of Software and Services Companies (NASSCOM); NIC; Shri Navin Jain, Senior Director, Centre for Development of Advanced Computing (C-DAC)
- 14. DIGITAL TECHNOLOGY AND PLATFORMS:** Shri Anil Swaroop, Ex-Secretary, Coal/HRD, GoI & Ex-CEO, RSBY; Shri Vishnu Chandra, DDG & Head of Group, NIC ; Sh. Prakash Kumar, CEO, Goods and Service Tax Network (GSTN); Shri Sanjay Goel, Joint Secretary, Ministry of Electronics and Information Technology (MeitY) ; Shri P. Mohanty, DDG, Unique Identification Authority of India (UIDAI); Shri Abhishek Singh, President & CEO, NeGD/My Gov; .Shri Dinesh Tyagi, CEO, CSC; Shri D.K. Singh, Director, Centre for Railway Information Systems (CRIS); Shri Vishal Anand Kanvaty, Chief of Innovation, National Payments Corporation of India (NPCI); NASSCOM;
- 15. CITIZEN CENTRIC PLANNING:** Shri Kunal Kumar, Joint Secretary, Smart Cities, MoHUA; Shri Hitesh Vaidya, Director, National Institute of Urban Affairs; Dr. Rakesh Kumar, Chief Advisor, UN Habitat, India; World Resources Institute WRI, Observer Research Foundation (ORF), IIPA; TCPO;
- 16. HOUSING INFRASTRUCTURE AND ZONING REGULATIONS:** Dr. Sekhar Bonu, DG, DMEO, NITI Ayog; Shri Biswajit Banerjee, Joint Secretary, Rural Development; Smt. D. Thara, JS, AMRUT, MoHUA ; Prof. Dr. P.S.N. Rao, Director, School of Planning and Architecture, Delhi; Shri P.K. Gupta, CEO & MD, National Buildings Construction Corporation Limited; HUDCO; MMRDA; HMDA; World Bank; KfW; CREDAI; Shri Balvinder Kumar, Member UP RERA, Ex VC, DDA
- 17. IMPLEMENTATION STRATEGIES:** Shri Shankar Aggarwal, Ex-Secretary, MoHUA; Shri P K Sarangi, Commissioner, NCR Cell Uttar Pradesh ; Smt. Kanchan Verma, V.C., GDA; Dr. Christoph Kessler, Country Head, KfW; Shri O.P. Agarwal, CEO, World Research Institute



Annexure-D-2.1

2. DEMOGRAPHY AND SETTLEMENT PATTERN

SNAPSHOT OF NCR DEMOGRAPHY

1. Growth of population in the NCT of Delhi has been much higher than others mega cities in every decade since 1951 (Table D-2.1.1)
2. The four megacities namely, Delhi, Mumbai, Kolkata, and Chennai together account for more than 15 percent of India's urban population and about 4.45 percent reside in the NCT of Delhi.
3. Over the period of 2001 to 2011, while the share of Delhi declined and that of Uttar Pradesh marginally increased¹ the urban population of the NCR constituent areas was 231.69 lakh (48.87 percent) in 2001, which has increased to 317.31 lakh (54.56 percent) in 2011.
4. Sub-region wise analysis indicates that the NCT of Delhi has the highest population density of 11,320 persons per sqkm followed by Uttar Pradesh (1,263 persons per sq km), Haryana (649 persons per sq km) and Rajasthan (463 persons per sq km). The average density of the NCR excluding NCT Delhi is about 772 persons per sq km in 2011, which increased from 627 persons per sq. km in 2001. The Sub-region wise population density is given in Table D-2.1.2.

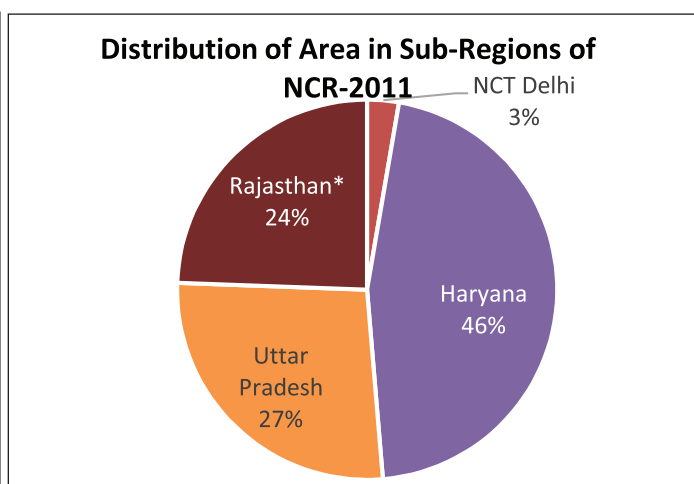
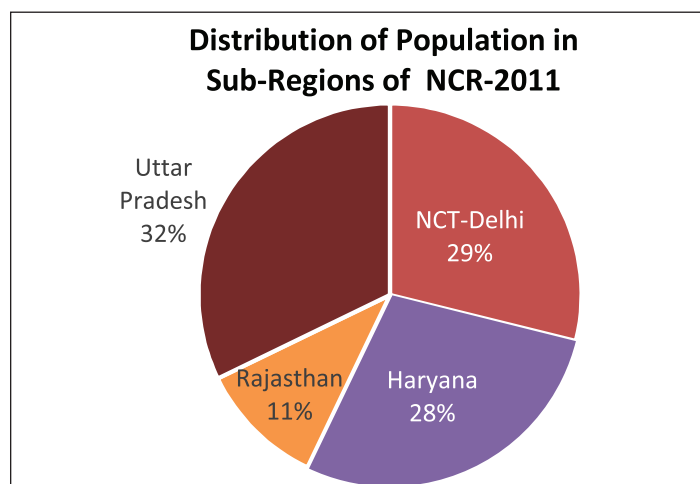


Figure: D-2.1.1- Distribution of Population in Sub-Regions of NCR-2011

Figure: D-2.2.2- Distribution of Area in Sub- Regions of NCR-2011

Table D-2.1.1: Comparative Growth of the NCT of Delhi and Mega Cities in India, 1951-2011

Year	Greater Mumbai UA			Kolkata UA			Chennai UA			NCT-Delhi		
	Area in square km	Population	Decadal Growth Rate in percent	Area in square km	Population	Decadal Growth Rate in percent	Area in square km	Population	Decadal Growth Rate in percent	Area in square km	Population	Decadal Growth Rate in percent
1951		3,216,904			4,685,869			1,542,333			1,744,072	
1961	539.83	4,515,495	40.37	610.50	6,008,656	28.23	226.07	1,944,502	26.08	1483	2,658,612	52.44
1971	559.99	6,596,370	46.08	679.36	7,447,429	23.95	490.58	3,155,944	62.30	1483	4,065,698	52.93
1981	588.50	9,421,962	42.84	870.35	9,232,103	23.96	531.82	4,273,329	35.41	1483	6,220,406	53.00
1991	1040.90	12,596,243	33.69	920.65	11,110,314	20.34	580.06	5,416,903	26.76	1483	9,420,644	51.45
2001	1135.11	16,434,386	30.47	1046.46	13,251,339	19.27	788.69	6,686,140	23.43	1483	13,850,507	47.02
2011	1063.49	18,394,912	11.93	1056.13	14,057,991	6.09	932.47	8,653,521	29.42	1483	16,787,941	21.21
Average			34.23			20.31			33.90			46.34

Source: Census of India (1951, 1961, 1971, 1981, 1991, 2001 and 2011)

¹Report on Population Projections for NCR (2016-2041)

Table D-2.1.2: Sub-region wise Distribution, Growth of Population Density in NCR, 2001-2011

Region and Sub-region	Area (sq km)	Population		Decadal Growth (Rate Percent)	Share of Population (Percent)		Density (Person per sq km)	
		2001	2011	2001-2011	2001	2011	2001	2011
NCT-Delhi	1,483	13,850,507	16,787,941	21.21	29.19	28.87	9,340	11,320
Haryana	14,826	13,388,603	16,427,524	22.70	28.22	28.25	529	649
Rajasthan	13,447	5,093,734	6,222,641	22.16	10.74	10.70	379	463
Uttar Pradesh	25,327	15,110,452	18,719,180	23.88	31.85	32.19	1,019	1,263
NCR	55,083	47,443,296	58,157,286	22.58	100.00	100	861	1,056

Source: Census of India (2001, 2011); Report on population projections for the National Capital Region 2016-2041.

Table D-2.1.3: District wise Population and Sex Ratio of NCR, 2011

District/ State	Population 2011			Sex Ratio 2011
	Male	Female	Total	
NCT Delhi				
Delhi	8987326	7800615	16787941	868
Haryana Sub-region				
Faridabad	966110	843623	1809733	873
Gurgaon	816690	697742	1514432	854
Jhajjar	514667	443738	958405	862
Mewat	571162	518101	1089263	907
Palwal	554497	488211	1042708	880
Panipat	646857	558580	1205437	864
Rewari	474335	425997	900332	898
Rohtak	568479	492725	1061204	867
Sonipat	781299	668702	1450001	856
Mahendergarh	486665	435423	922088	895
Bhiwani	866672	767773	1634445	886
Jind	713006	621146	1334152	871
Karnal	797712	707612	1505324	887
Total & SR	8758151	7669373	16427524	876
Uttar Pradesh Sub-region				
Baghpat	700070	602978	1303048	861
Bulandshahr	1845260	1653911	3499171	896
Gautam Buddha Nagar	890214	757901	1648115	851
Ghaziabad	2488834	2192811	4681645	881
Hapur				
Meerut	1825743	1617946	3443689	886
Muzaffarnagar	2193434	1950078	4143512	889
Shamli				
Total & SR	9943555	8775625	18719180	883
Rajasthan Sub-region				
Alwar	1939026	1735153	3674179	895
Bharatpur	1355726	1192736	2548462	880
Total & SR	3294752	2927889	6222641	889
NCR	30983784	27173502	58157286	877

Source: Census 2011, Census of India.



Annexure-D-2.2

SUB-REGION WISE ANALYSIS OF DECADEAL TRENDS IN POPULATION GROWTH AND MIGRATION IN NCR

1. **NATIONAL CAPITAL TERRITORY OF DELHI-** Decadal growth of population in the National Capital Territory of Delhi during the period 1951-1991 has been consistently above 50 percent. However, during the 2001-2011, the population growth declined drastically from 47.02 percent to 21.21percent. Table D-2.2.2 depicts the growth of population from 1901 to 2011.

1.1 Rural Population

As per the Census of India 2011, rural population of the NCT of Delhi was 419,042. The rural population showed sharp increase during the decade 1981-1991 (109.86 percent), after which it declined by minus 0.45 percent during 1991-2001 to minus 55.64 percent during 2001-2011. **Table D-2.2.2** depicts the growth of urban and rural population in the NCT of Delhi from 1901 to 2011.

1.2 Urban Population

Around 84.71 lakh persons lived in Delhi's urban area in 1991, which increased to 163 lakh, almost doubled in 2011 **Table D-2.2.2**. The NCT of Delhi is highly urbanized with 97.50 percent (**Table D-2.2.3**) of its population living in urban areas as against the national average of 31.14percent in 2011. The percentage decadal growth of urban and rural population in the NCT of Delhi during 1951-2011 is shown in **Table D-2.2.2**.

1.3 Components of Growth in the NCT of Delhi

Migration plays an important role in the growth of population of the NCT of Delhi. **Table D-2.2.1** presents the migration data for Delhi for the period of 1961-2011. The figures pertaining to natural increase depicts downfall in the total figure of component of natural increase from 26.27 lakhs in 2001 to 11.48 lakhs in 2011 while immigration component has doubled from 1991 (15.87 lakh) to 2011(26.01) with marginal increase during 2001-2011. The out migration has increased almost three times from 2.82 lakh in 1991 to 7.82 lakh in 2011.

Table D-2.2.1: Growth of Population and Migrants into Delhi (1961-2011)

Year	1961	1971	1981	1991	2001	2011
Population (in lakhs)	26.59	40.66	62.2	94.2	138.21	167.88
Growth Rate (in percent)	52.44	52.91	53.00	51.45	46.72	21.47
Growth of Population (lakhs)	-	14.07	21.54	32.00	44.01	29.67
Component of Migrants (lakhs)						
(a) In-migrants	-	8.76	12.30	15.87	22.22	26.01
(b) Out-migrants	-	2.42	2.78	2.82	4.58	7.82
(c) Net-migrants	-	6.34	9.52	13.05	17.64	18.19
Percent share	-	45.06	44.20	40.78	40.08	61.30
Component of natural increase (lakhs)	-	7.73	12.02	18.95	26.37	11.48
Percent share	-	54.94	55.80	59.21	59.92	38.69

Source: Census of India (1961, 1971, 1981, 1991, 2001 and 2011)

Table D-2.2.2: Growth of Population of NCT-Delhi, 1901-2011

Year	Total		Rural		Urban	
	Population	Decadal Growth	Population	Decadal Growth	Population	Decadal Growth
	(Person)	(percent)	(Person)	(percent)	(Person)	(percent)
1901	4,05,819	--	1,91,704	--	2,14,115	--
1911	4,13,851	1.98	1,75,907	-8.24	2,37,944	11.13



Year	Total		Rural		Urban	
	Population	Decadal Growth	Population	Decadal Growth	Population	Decadal Growth
	(Person)	(percent)	(Person)	(percent)	(Person)	(percent)
1921	4,88,452	18.03	1,84,032	4.62	3,04,420	27.94
1931	6,36,246	30.26	1,88,804	2.59	4,47,442	46.98
1941	9,17,939	44.27	2,22,253	17.72	6,95,686	55.48
1951	17,44,072	90.00	3,06,938	38.10	14,37,134	106.58
1961	26,58,612	52.44	2,99,204	-2.52	23,59,408	64.17
1971	40,65,698	52.93	4,18,675	39.93	36,47,023	54.57
1981	62,20,406	53.00	4,52,206	8.01	57,68,200	58.16
1991	94,20,644	51.45	9,49,019	109.86	84,71,625	46.87
2001	138,50,507	47.02	9,44,727	-0.45	1,29,05,780	52.34
2011	1,67,87,941	21.21	41,90,42	-55.64	1,63,68,899	26.83

Source: Census of India (1901 – 2011).

Table D-2.2.3: Trends of Urbanization in NCT-Delhi (in lakhs)

Census Year	1951	1961	1971	1981	1991	2001	2011
Percent Urban	82.40	88.75	89.68	92.73	89.93	93.16	97.50

Source: Census of India (1951, 1961, 1971, 1981, 1991, 2001 and 2011).

2. HARYANA SUB-REGION

Table D-2.2.4: Growth of Population in Haryana Sub-region, 2001-2011

Year	Total		Rural		Urban	
	Population (Person)	Decadal Growth (percent)	Population (Person)	Decadal Growth (percent)	Population (Person)	Decadal Growth (percent)
2001	13,388,603	--	9,464,477	--	3,924,126	--
2011	16,427,524	22.70	10,439,814	10.30	5,987,710	52.59

Source: Census of India (2001 and 2011).

3. RAJASTHAN SUB-REGION

Table D-2.2.5: Growth of Population in Rajasthan Sub-region i.e. the Entire Alwar and Bharatpur Districts, 2001-2011

Year	Total		Rural		Urban	
	Population (Person)	Decadal Growth (percent)	Population (Person)	Decadal Growth (percent)	Population (Person)	Decadal Growth (percent)
2001	5,093,734	--	4,249,835	--	843,899	--
2011	6,222,641	22.16	5,073,091	19.37	1,149,550	36.22

Source: Census of India (2001 and 2011)

4. UTTAR PRADESH SUB-REGION

Table D-2.2.6: Growth of Population in Uttar Pradesh Sub-region, 2001-2011

Year	Total		Rural		Urban	
	Population (Person)	Decadal Growth (percent)	Population (Person)	Decadal Growth (percent)	Population (Person)	Decadal Growth (percent)
2001	15,110,452	--	9,584,867	--	5,525,585	--
2011	18,719,180	23.88	10,494,174	9.49	8,225,006	48.85

Source: Census of India (2001 and 2011)



Annexure-D-2.3

POPULATION PROJECTIONS FOR NCR

NCRPB has carried out population projection analysis through former Census of India expert and a “Report on Population Projections for NCR (2016-2041)”, was prepared. The population projections for NCR as per Final/ Approved report are as under:

Table D-2.3.1: Projected Rural and Urban Population of the NCR

NCR and Sub-Regions	2011	2021	2031	2041
Haryana Sub-Region				
Urban	5,987,710	8,901,944	13,140,403	19,408,451
Rural	10,439,814	11,510,160	12,690,244	13,991,316
Total	16,427,524	20,412,105	25,830,647	33,399,767
Uttar Pradesh Sub-Region				
Urban	8,225,006	11,872,707	16,882,545	23,786,926
Rural	10,494,174	11,485,056	12,569,499	13,756,338
Total	18,719,180	23,357,763	29,452,045	37,543,264
Rajasthan Sub-Region				
Urban	1,149,550	1,540,531	2,044,211	2,690,555
Rural	5,073,091	6,046,448	7,206,560	8,589,259
Total	6,222,641	7,586,979	9,250,771	1,1279,814
Delhi				
Urban	16,368,899	20,284,030	24,981,804	30,770,279
Rural	419,042	179,486	76,878	32,929
Total	16,787,941	20,463,516	25,058,682	30,803,208
NCR				
Urban	31,731,165 (54.56 percent)	42,599,212 (59.31 percent)	57,048,964 (63.68 percent)	76,656,211 (67.82 percent)
Rural	26,426,121 (45.44 percent)	29,221,150 (40.69 percent)	32,543,181 (36.32 percent)	36,369,842 (32.18 percent)
Total	58,157,286	71,820,362	89,592,145	113,026,053

Table D-2.3.2: Projected Population of Regional Centres

Regional Centers	Population (Census 2011)	Projected Population				
	2011	2021	2026	2031	2036	2041
1. Alwar (M CI + OG)	322568	403338	432685	464167	497940	534170
2. Bahadurgarh (M CI)	170767	231861	255611	281793	310658	342479
3. Bharatpur (M CI + OG)	252838	316147	339151	363827	390300	418698
4. Bhiwani (M CI)	196057	266198	293466	323526	356665	393199
5. Bulandshahr (NPP + OG)	230024	325413	387049	460360	547556	651268
6. Hapur (NPP)	262983	372040	442508	526323	626013	744585
7. Jhajjar (MC)	48424	65748	72483	79907	88093	97116
8. Jind (M CI)	167592	227550	250858	276554	304882	336112
9. Karnal (M CI + OG)	302140	410234	452255	498580	549651	605953
10. Khora (CT)	190005	268799	319711	380268	452294	537962
11. Khurja (NPP + OG)	121207	171471	203949	242578	288525	343174



Regional Centers	Population (Census 2011)	Projected Population				
	2011	2021	2026	2031	2036	2041
12. Modinagar (NPP)	130325	184370	219291	260827	310229	368990
13. Nuh (MC)	16260	22077	24339	26832	29580	32610
14. Panipat (M CI + OG)	295970	401856	443019	488399	538426	593578
15. Rohtak (M CI)	374292	508199	560255	617643	680909	750656
16. Shamli (NPP)	107266	158475	192624	234131	284582	345905
17. Sonipat (M CI + OG)	289333	392845	433085	477446	526352	580268
18. Charkhi Dadri (MC)	56337	76492	84327	92965	102488	112986
19. Narnaul (M CI)	74581	74581	111636	123071	135677	149575
20. Rewari (M CI)	143021	143021	214079	236008	260183	286834
21. Palwal (M CI + OG)	131926	131926	197472	217699	239999	264582
22. Baghpat (NPP)	50310	50310	84654	100688	119759	142443
Total	3934226	5202950	6014504	6773592	7640760	8633142

Source: Report on Population Projections for National Capital Region 2016-2041

Table D-2.3.3: District - wise Rural-Urban projected Population of NCR, 2011-41

Sr.No.	Name	TRU	2011	2021	2026	2031	2036	2041
	District							
	Haryana Sub-Region							
1	Faridabad	Total	18,09,733	2379713	2728851	3129211	3588310	4114765
		Rural	3,70,878	203190	51924	14555	14555	14555
		Urban	14,38,855	2176523	2676927	2790044	2790044	2790044
2	Gurgaon	Total	15,14,432	2592807	3392582	4439054	5808321	7599951
		Rural	4,72,179	1016214	1453516	2054179	2875140	3992404
		Urban	10,42,253	1576592	1939066	2384876	2933181	3607547
3	Jhajjar	Total	9,58,405	1042304	1086968	1133547	1182121	1232777
		Rural	7,15,066	674210	634247	576740	497299	390509
		Urban	2,43,339	368093	452722	556806	684822	842269
4	Mewat	Total	10,89,263	1505867	1770572	2081807	2447752	2878023
		Rural	9,65,157	1318135	1539678	1797829	2098484	2448456
		Urban	1,24,106	187732	230894	283978	349268	429568
5	Palwal	Total	10,42,708	1307182	1463601	1638737	1834830	2054388
		Rural	8,06,164	949367	1023521	1097479	1169132	1235639
		Urban	2,36,544	357815	440080	541258	665699	818749
6	Panipat	Total	12,05,437	1497365	1668857	1859991	2073015	2310436
		Rural	6,50,352	657700	636146	589850	510856	389122
		Urban	5,55,085	839664	1032711	1270141	1562159	1921314
7	Rewari	Total	9,00,332	1053989	1140388	1233870	1335015	1444451
		Rural	6,66,902	700885	706102	699737	678080	636480
		Urban	2,33,430	353104	434286	534133	656935	807971
8	Rohtak	Total	10,61,204	1195144	1268326	1345989	1428408	1515874
		Rural	6,15,040	520242	438258	325080	172782	-28432
		Urban	4,46,164	674902	830069	1020909	1255626	1544306
9	Sonipat	Total	14,50,001	1677606	1804475	1940939	2087722	2245607
		Rural	9,96,637	991813	961012	903555	811834	676379
		Urban	4,53,364	685793	843464	1037384	1275889	1569227



Sr.No.	Name	TRU	2011	2021	2026	2031	2036	2041
10	Jind	Total	13,34,152	1693050	1907226	2148496	2420286	2726459
		Rural	10,28,569	1230802	1338702	1449263	1560293	1668746
		Urban	3,05,583	462248	568524	699233	859993	1057713
11	Karnal	Total	15,05,324	1910269	2151924	2424148	2730810	3076265
		Rural	10,50,514	1222288	1305770	1383455	1450852	1502032
		Urban	4,54,810	687981	846154	1040693	1279958	1574232
12	Mahendragarh	Total	9,22,088	1170138	1318163	1484915	1672761	1884370
		Rural	7,89,233	969171	1070992	1180917	1298871	1424519
		Urban	1,32,855	200967	247171	303998	373890	459851
13	Bhiwani	Total	16,34,445	2074125	2336507	2632082	2965048	3340135
		Rural	13,13,123	1752803	2015185	2310760	2643726	3018813
		Urban	3,21,322	321322	321322	321322	321322	321322
	UP Sub-Region							
14	Baghpat	Total	13,03,048	1457907	1542108	1631171	1725378	1825025
		Rural	10,28,023	1051667	1048380	1031113	996091	938679
		Urban	2,75,025	406240	493728	600058	729286	886346
15	Bulandshahr	Total	34,99,171	4066795	4384256	4726498	5095456	5493215
		Rural	26,31,742	2785515	2827038	2833916	2795286	2697680
		Urban	8,67,429	1281281	1557218	1892582	2300170	2795536
16	Gautam Buddha Nagar	Total	16,48,115	2483016	3047722	3740859	4591635	5635901
		Rural	6,73,806	1043862	1298632	1615084	2008051	2495914
		Urban	9,74,309	1439153	1749091	2125776	2583584	3139987
17	Meerut	Total	34,43,689	3991659	4297522	4626823	4981356	5363056
		Rural	16,84,507	1393168	1139419	788588	316516	-306407
		Urban	17,59,182	2598491	3158103	3838235	4664840	5669463
18	Ghaziabad	Total	33,43,334	4686422	5548457	6569057	7777390	9207987
		Rural	5,90,534	620257	606599	562918	477764	336309
		Urban	27,52,800	4066165	4941858	6006140	7299626	8871678
19	Hapur	Total	13,38,311	1606435	1760015	1928277	2112626	2314599
		Rural	9,28,564	1001197	1024433	1034279	1026096	994073
		Urban	4,09,747	605238	735582	893998	1086530	1320526
20	Muzaffarnagar	Total	28,69,934	3444912	3774255	4135084	4530409	4963529
		Rural	20,64,724	2255535	2328733	2378253	2395226	2368511
		Urban	8,05,210	1189377	1445522	1756831	2135183	2595018
21	Shamli	Total	12,73,578	1528733	1674884	1835008	2010440	2202643
		Rural	8,87,476	958422	981750	992599	986609	958320
		Urban	3,86,102	570312	693135	842409	1023830	1244323
	Rajasthan Sub-Region							
22	Alwar	Total	36,74,179	4541379	5048954	5613260	6240636	6938132
		Rural	30,19,728	3654056	4015755	4410202	4839795	5306993
		Urban	6,54,451	887323	1033199	1203057	1400840	1631139
23	Bharatpur	STATE	25,48,462	3149964	3502025	3893435	4328592	4812385
		Rural	20,53,363	2478695	2720399	2983310	3268842	3578412
		Urban	4,95,099	671269	781626	910125	1059750	1233973



Sr.No.	Name	TRU	2011	2021	2026	2031	2036	2041
	NCT-Delhi							
24	North West	Total	3656539	4659677	5260157	5938018	6703233	7567060
		Rural	213950	111389.06	32231.003	0	0	0
		Urban	3442589	4548288	5227926	5938018	6703233	7567060
25	North	Total	887978	1008116	1074149	1144507	1219475	1299352
		Rural	17746	6432	3872	2331	1403	845
		Urban	870232	1014547	1078021	1146838	1220878	1300197
26	North East	Total	2241624	2834160	3186802	3583323	4029180	4530514
		Rural	21527	2672	941	332	117	41
		Urban	2220097	2836831	3187743	3583654	4029297	4530555
27	East	Total	1709346	1993998	2153635	2326053	2512274	2713403
		Rural	3530	588	240	98	40	16
		Urban	1705816	1994586	2153875	2326150	2512313	2713419
28	New Delhi	Total	142004	112276	99835	88772	78935	70188
		Rural	0	0	0	0	0	0
		Urban	142004	112276	99835	88772	78935	70188
29	Central	Total	582320	524317	497519	472091	447963	425068
		Rural	0	0	0	0	0	0
		Urban	582320	524317	497519	472091	447963	425068
30	West	Total	2543243	3033473	3312961	3618199	3951560	4315635
		Rural	6420	314	70	15	3	1
		Urban	2536823	3033788	3313030	3618214	3951564	4315636
31	South West	Total	2292958	2985245	3406214	3886546	4434613	5059967
		Rural	143676	90608	71954	57141	45377	36035
		Urban	2149282	3075853	3478168	3943687	4479991	5096002
32	South	Total	2731929	3286522	3604708	3953700	4336479	4756317
		Rural	12193	618	139	31	7	2
		Urban	2719736	3287140	3604847	3953731	4336486	4756319
		Total	1,67,87,941	20463516		25058682	27770712	30803208
		Rural	4,19,042	179486	117467	76878	50314	32929
		Urban	1,63,68,899	20284030	22515583	24981804	27720398	30770279

Source: Report on Population Projections for National Capital Region 2016-2041

Table D-2.3.4. Projected Population of Cities/ Towns using the exponential growth rate of Urban area of the sub-regions of NCR states

Sr.No.	Name	2011	2016	2021	2026	2031	2036	2041
1	NCT Delhi Sub Region	1,67,87,941	18523134	20463516	22633050	25058682	27770712	30803208
	HARYANA SUBREGION							
1	Faridabad District							
1	Faridabad (M Corp.)	14,14,050	1741550	1919941	2116604	2333412	2572429	2835928
2	Tilpat (CT)	20,514	25265	27853	30706	33851	37319	41142
3	Piala (54) (CT)	4,291	5285	5826	6423	7081	7806	8606
2	Gurugram District							
4	Hailey Mandi (MC)	20,906	25748	28385	31293	34498	38032	41928
5	Pataudi (MC)	20,418	25147	27723	30562	33693	37144	40949
6	Gurgaon (M Corp. + OG)	8,86,519	1091841	1203680	1326976	1462900	1612748	1777946
7	Garhi Harsaru (46) (CT)	7,894	9722	10718	11816	13026	14361	15832



Sr.No.	Name	2011	2016	2021	2026	2031	2036	2041
8	Badshahpur (87) (CT)	15,593	19204	21172	23340	25731	28367	31272
9	Farrukhnagar (MC)	13,513	16643	18347	20227	22299	24583	27101
10	Manesar (154) (CT)	23,448	28879	31837	35098	38693	42656	47026
11	Sohna (MC)	36,552	45018	49629	54712	60317	66495	73306
12	Bhondsi (168) (CT)	17,410	21442	23639	26060	28729	31672	34916
3	Jhajjar District							
13	Beri (MC)	15,934	19624	21635	23851	26294	28987	31956
14	Bahadurgarh (M Cl)	1,70,767	210317	231861	255611	281793	310658	342479
15	Ladrawan (CT)	6,905	8504	9375	10336	11394	12562	13848
16	Jhajjar (MC)	48,424	59639	65748	72483	79907	88093	97116
17	Faizabad (87) (CT)	1,309	1612	1777	1959	2160	2381	2625
4	Mewat District							
18	Taoru (MC)	22,599	27833	30684	33827	37292	41112	45323
19	Khori Kalan (37) (CT)	6,007	7398	8156	8992	9913	10928	12047
20	Nuh (MC)	16,260	20026	22077	24339	26832	29580	32610
21	Salamba (154) (CT)	5,727	7053	7776	8572	9450	10419	11486
22	Ferozepur jhirka (MC)	24,750	30482	33605	37047	40842	45025	49637
23	Nagina (51) (CT)	11,417	14061	15502	17089	18840	20770	22897
24	Punahana (MC)	24,734	30463	33583	37023	40815	44996	49605
25	Pingwan (127) (CT)	12,612	15533	17124	18878	20812	22944	25294
5	Palwal District							
26	Palwal (M Cl + OG)	1,31,926	162481	179124	197472	217699	239999	264582
27	Baghola (44) (CT)	5,413	6667	7350	8102	8932	9847	10856
28	Palwal (Rural) (Part) (73) (CT)	23,072	28416	31326	34535	38073	41972	46272
29	Hathin (MC)	14,421	17761	19580	21586	23797	26235	28922
30	Hassan Pur (MC)	11,569	14248	15708	17317	19091	21046	23202
31	Hodal (MC)	50,143	61756	68082	75056	82744	91220	100564
6	Panipat District							
32	Panipat (M Cl + OG)	2,95,970	364518	401856	443019	488399	538426	593578
33	Kachrauli (1) (CT) WARD NO.-0001	5,400	6651	7332	8083	8911	9824	10830
34	Kabri (18) (CT) WARD	7,049	8682	9571	10551	11632	12823	14137
35	Sikanderpur (19) (CT)	8,894	10954	12076	13313	14677	16180	17837
36	Asan Khurd (CT)	6,873	8465	9332	10288	11342	12503	13784
37	Panipat Taraf Ansar (CT)	42,877	52807	58217	64180	70754	78002	85991
38	Panipat Taraf Makhdum Zadgan (CT)	67,998	83747	92325	101782	112208	123701	136372
39	Ugra Kheri(19) (CT)	24,440	30100	33184	36583	40330	44461	49015
40	Panipat Taraf Rajputan (CT)	28,803	35474	39108	43113	47530	52398	57765
41	Sec. 11&12 Part II (CT)	8,876	10932	12051	13286	14647	16147	17801
42	Kheri Nangal (131) (CT)	18,195	22409	24704	27235	30025	33100	36491
43	Samalkha (MC + OG)	39,710	48907	53917	59439	65528	72240	79640
7	Rewari District							
44	Bhakali (165) (CT)	9,970	12279	13537	14923	16452	18137	19995
45	Dharuhera (MC)	30,344	37372	41200	45420	50073	55202	60856
46	Rewari (M Cl)	1,43,021	176145	194188	214079	236008	260183	286834
47	Aakera (292) (CT)	7,110	8757	9654	10643	11733	12934	14259
48	Ghatal Mahaniawas (291) (CT)	6,005	7396	8153	8989	9909	10924	12043
49	Maheshari (293) (CT)	9,180	11306	12464	13741	15148	16700	18411
50	Rampura (132) (CT)	5,954	7333	8084	8912	9825	10831	11941
51	Manethi (28) (CT)	5,070	6244	6884	7589	8366	9223	10168



Sr.No.	Name	2011	2016	2021	2026	2031	2036	2041
52	Bawal (MC)	16,776	20661	22778	25111	27683	30519	33645
8	Rohtak District							
53	Maham (MC)	20,484	25228	27812	30661	33802	37264	41081
54	Rohtak (M Cl)	3,74,292	460980	508199	560255	617643	680909	750656
55	Kalanaur (MC)	23,319	28720	31662	34905	38480	42422	46767
56	Sunari Kalan (101) (CT)	7,506	9244	10191	11235	12386	13655	15054
57	Sampla (MC)	20,563	25325	27920	30779	33932	37408	41240
9	Sonipat District							
58	Gohana (MC)	65,708	80926	89216	98354	108429	119535	131780
59	Ganaur (MC)	35,603	43849	48340	53292	58751	64769	71403
60	Sonipat (M Cl + OG)	2,89,333	356344	392845	433085	477446	526352	580268
61	Fazalpur (81) (CT)	3,692	4547	5013	5526	6092	6716	7404
62	Bayyanpur (207) (CT)	5,406	6658	7340	8092	8921	9835	10842
63	Badh Malak (68) (CT)	6,938	8545	9420	10385	11449	12622	13914
64	Kundli (55) (CT)	21,633	26643	29372	32381	35698	39355	43386
65	Kharkhoda (MC)	25,051	30853	34013	37497	41338	45573	50241
10	Jind District							
66	Narwana (M Cl)	62,090	76470	84303	92939	102459	112954	124524
67	Uchana (MC)	16,815	20709	22831	25169	27747	30590	33723
68	Jind (M Cl)	1,67,592	206407	227550	250858	276554	304882	336112
69	Julana (MC)	18,755	23099	25465	28073	30949	34119	37614
70	Safidon (MC)	34,728	42771	47152	51982	57307	63177	69648
71	Bhuran (16) (CT)	5,603	6901	7608	8387	9246	10193	11237
11	Karnal District							
72	Nilokheri (MC)	17,938	22093	24356	26850	29601	32633	35975
73	Taraori (MC)	25,944	31953	35226	38834	42812	47197	52032
74	Indri (MC)	17,487	21537	23743	26175	28856	31812	35071
75	Karnal (M Cl + OG)	3,02,140	372117	410234	452255	498580	549651	605953
76	Nissing (MC)	17,438	21477	23677	26102	28776	31723	34973
77	Uncha Siwana (CT)	8,922	10988	12114	13355	14723	16231	17893
78	Assandh (MC)	27,125	33407	36829	40602	44761	49346	54400
79	Gharaunda (MC)	37,816	46574	51345	56604	62403	68795	75841
12	Mahendragarh District							
80	Kanina (MC)	12,989	15997	17636	19442	21434	23629	26050
81	Mahendragarh (MC)	29,128	35874	39549	43600	48066	52989	58417
82	Ateli (MC)	7,619	9384	10345	11404	12573	13860	15280
83	Narnaul (M Cl)	74,581	91854	101263	111636	123071	135677	149575
84	Nagal Chaudhry (CT)	8,538	10515	11593	12780	14089	15532	17123
13	Bhiwani District							
85	Bawani khera (MC)	20,289	24988	27548	30369	33480	36910	40690
86	Bhiwani (M Cl)	1,96,057	241465	266198	293466	323526	356665	393199
87	Tosham (CT)	15,559	19163	21125	23289	25675	28305	31204
88	Siwani (MC)	19,143	23577	25992	28654	31589	34825	38392
89	Loharu (MC)	13,937	17165	18923	20861	22998	25354	27951
90	Charkhi Dadri (MC)	56,337	69385	76492	84327	92965	102488	112986
	UTTAR PRADESH SUBREGION							
1	Baghpat District							
91	Chhaprauli (NP)	18,970	22563	26837	31920	37966	45157	53710
92	Tikri (NP)	14,092	16761	19936	23712	28203	33545	39899



Sr.No.	Name	2011	2016	2021	2026	2031	2036	2041
93	Doghat (NP)	14,166	16849	20041	23836	28351	33721	40108
94	Baraut (NPP)	1,03,764	123418	146794	174598	207669	247003	293787
95	Baghpat (NPP)	50,310	59839	71173	84654	100688	119759	142443
96	Agarwal Mandi (Tatiri) (NP)	13,873	16501	19626	23343	27765	33024	39279
97	Aminagar Sarai (NP)	11,174	13290	15808	18802	22363	26599	31637
98	Khekada (NP)	48,676	57896	68862	81905	97418	115870	137817
2	Bulandshahr District							
99	Sikandrabad (NPP)	81,028	96375	114630	136342	162166	192881	229415
100	Kakod (NP)	9,213	10958	13034	15502	18438	21931	26085
101	Aurangabad (NP)	26,544	31572	37552	44664	53124	63186	75154
102	Bulandshahr (NPP + OG)	2,30,024	273593	325413	387049	460360	547556	651268
103	Gulaothi (NPP)	50,823	60449	71899	85517	101715	120981	143895
104	Bahalimpura (CT)	4,921	5853	6962	8280	9849	11714	13933
105	Bhawan Bahadur Nagar (NP)	10,188	12118	14413	17143	20390	24252	28845
106	Siana (NPP)	44,415	52828	62834	74735	88890	105727	125752
107	Bugrasi (NP)	14,992	17832	21209	25226	30004	35687	42447
108	Khanpur (NP)	17,247	20514	24399	29021	34517	41055	48831
109	Anupshahr (NPP)	29,087	34596	41149	48943	58213	69240	82354
110	Jahangirabad (NPP)	59,858	71196	84681	100720	119797	142488	169476
111	Dibai (NPP)	39,818	47360	56330	67000	79690	94784	112737
112	Naraura (NP)	22,775	27089	32220	38322	45581	54214	64483
113	Shikarpur (NPP)	37,969	45161	53714	63888	75989	90383	107502
114	Pahasu (NP)	20,672	24587	29245	34784	41372	49208	58529
115	Chhatari (NP)	11,373	13527	16089	19137	22761	27073	32200
116	Khurja (NPP + OG)	1,21,207	144165	171471	203949	242578	288525	343174
117	Hasangarh (CT)	6,541	7780	9254	11006	13091	15570	18520
118	Khurja Rural (CT)	21,383	25433	30250	35980	42795	50901	60542
119	Maina Maujpur (CT)	7,351	8743	10399	12369	14712	17499	20813
3	Gautam Buddha Nagar District							
120	Dadri (NPP)	91,189	108461	129004	153439	182502	217069	258184
121	Chippyana Buzurg (CT)	17,400	20696	24616	29278	34824	41419	49265
122	Chhapraula (CT)	15,154	18024	21438	25499	30329	36073	42906
123	Patadi (CT)	8,479	10085	11995	14267	16969	20184	24007
124	Noida (CT)	6,37,272	757977	901544	1072304	1275408	1516981	1804310
125	Salarpur Khadar (CT)	13,600	16176	19240	22884	27218	32374	38506
126	Bilaspur (NP)	8,980	10681	12704	15110	17972	21376	25425
127	Dankaur (NP)	13,520	16081	19127	22749	27058	32183	38279
128	Greater Noida (CT)	1,02,054	121384	144375	171721	204246	242932	288946
129	Kherli Hafizpur (CT)	7,932	9434	11221	13347	15875	18882	22458
130	Rabupura (NP)	15,454	18381	21863	26004	30929	36787	43755
131	Jahangirpur (NP)	11,006	13091	15570	18519	22027	26199	31161
132	Jewar (NP)	32,269	38381	45651	54297	64582	76814	91363
4	Meerut District							
133	Karnawal (NP)	11,663	13872	16500	19625	23342	27763	33021
134	Sardhana (NPP)	58,252	69285	82409	98018	116583	138665	164929
135	Daurala (NP)	19,776	23522	27977	33276	39579	47075	55992
136	Lawar (NP)	22,024	26196	31157	37059	44078	52427	62357
137	Phalauda (NP)	19,908	23679	28164	33498	39843	47390	56366
138	Bahsuma (NP)	11,753	13979	16627	19776	23522	27977	33276



Sr.No.	Name	2011	2016	2021	2026	2031	2036	2041
139	Hastinapur (NP)	26,452	31462	37421	44509	52940	62967	74894
140	Mawana (NPP)	81,443	96869	115217	137040	162996	193869	230590
141	Parikshitgarh (NP)	19,830	23586	28053	33367	39687	47204	56145
142	Kithaur (NP)	27,933	33224	39517	47001	55904	66493	79087
143	Meerut (M Corp.)	13,05,429	1552688	1846781	2196577	2612628	3107482	3696066
144	Meerut (CB)	93,312	110986	132008	157011	186751	222123	264195
145	Sewalkhas (NP)	24,882	29595	35200	41868	49798	59230	70448
146	Kharkhoda (NP)	14,364	17085	20321	24170	28747	34192	40669
147	Sindhawali (CT)	5,335	6345	7547	8977	10677	12700	15105
148	Amehra Adipur (CT)	5,485	6524	7760	9229	10977	13057	15530
149	Aminagar Urf Bhurbaral (CT)	6,141	7304	8688	10333	12290	14618	17387
150	Mohiuddinpur (CT)	5,200	6185	7356	8750	10407	12378	14723
5	Ghaziabad District							
151	Patala (NP)	9,500	11299	13440	15985	19013	22614	26897
152	Niwari (NP)	9,205	10949	13022	15489	18422	21912	26062
153	Modinagar (NPP)	1,30,325	155010	184370	219291	260827	310229	368990
154	Faridnagar (NP)	12,785	15207	18087	21513	25587	30434	36198
155	Muradnagar (NPP)	95,208	113241	134690	160202	190545	226636	269563
156	Abupur (CT)	6,247	7430	8838	10512	12502	14871	17687
157	Basantpur Saitli (CT)	5,563	6617	7870	9361	11134	13242	15751
158	Muradgram Pur Pursi (CT)	5,120	6090	7243	8615	10247	12188	14496
159	Sikri Kalan (CT)	7,037	8370	9955	11841	14084	16751	19924
160	Rori (CT)	12,350	14689	17471	20781	24717	29398	34967
161	Aurangabad Gadana (CT)	6,170	7339	8729	10382	12348	14687	17469
162	Bisokhar (CT)	14,332	17047	20275	24116	28683	34116	40578
163	Begumabad Budhana (CT)	19,898	23667	28150	33481	39823	47366	56337
164	Ordnance Factory Muradnagar (CT)	7,569	9003	10708	12736	15148	18017	21430
165	Loni (NPP)	5,16,082	613832	730097	868384	1032864	1228497	1461185
166	Ghaziabad (M Corp.)	16,48,643	1960910	2332323	2774085	3299521	3924479	4667809
167	Dasna (NP)	34,914	41527	49393	58748	69875	83110	98852
168	Pavi Sadakpur (CT)	757	900	1071	1274	1515	1802	2143
169	Haqiqatpur Urf Khudawas (CT)	15,324	18226	21679	25785	30669	36478	43387
170	Banthla (CT)	5,766	6858	8157	9702	11540	13726	16325
171	Khora (CT)	1,90,005	225994	268799	319711	380268	452294	537962
6	Hapur District							
172	Pilkhuwa (NPP)	83,736	99596	118461	140898	167586	199328	237082
173	Hapur (NPP)	2,62,983	312794	372040	442508	526323	626013	744585
174	Babugarh (NP)	5,452	6485	7713	9174	10911	12978	15436
175	Garhmukhteshwar (NPP)	46,077	54804	65185	77531	92216	109683	130458
176	Buxer (CT)	11,499	13677	16268	19349	23014	27373	32557
7	Muzaffarnagar District							
177	Purquazi (NP + OG)	29,041	34542	41084	48866	58121	69130	82224
178	Charthawal (NP)	20,653	24565	29218	34752	41334	49163	58475
179	Muzaffarnagar (NPP)	3,92,768	467162	555646	660890	786068	934957	1112045
180	Sarwat (CT)	34,846	41446	49296	58634	69739	82948	98660
181	Shahbudinpur (CT)	25,157	29922	35589	42330	50348	59884	71227
182	Almaspur (CT)	13,318	15841	18841	22410	26654	31703	37707
183	Kukra (CT)	29,454	35033	41668	49561	58948	70113	83393
184	Sisauli (NP)	15,091	17949	21349	25393	30202	35923	42727



Sr.No.	Name	2011	2016	2021	2026	2031	2036	2041
185	Budhana (NP + OG)	53,722	63897	76000	90395	107517	127881	152103
186	Shahpur (NP)	20,154	23971	28512	33912	40335	47975	57062
187	Khatauli (NPP)	72,949	86766	103200	122747	145997	173650	206541
188	Khanupur (CT)	6,681	7946	9452	11242	13371	15904	18916
189	Shekhpura (CT)	9,529	11334	13481	16034	19071	22683	26979
190	Khatauli Rural (CT)	14,949	17780	21148	25154	29918	35585	42325
191	Jansath (NP)	19,786	23534	27991	33293	39599	47099	56020
192	Bhokarhedi (NP)	17,829	21206	25223	30000	35682	42441	50479
193	Miranpur (NP)	29,283	34829	41426	49273	58606	69706	82909
8	Shamli District							
194	Un (NP)	15,124	18383	22344	27159	33011	40125	48771
195	Jhinhana (NP)	18,740	22778	27686	33652	40904	49718	60432
196	Kairana (NPP)	89,000	108178	131489	159822	194261	236121	287002
197	Kandhla (NPP)	46,796	56880	69136	84034	102142	124152	150905
198	Ailam (NP)	12,110	14720	17891	21747	26433	32128	39052
199	Shamli (NPP)	1,07,266	130380	158475	192624	234131	284582	345905
200	Banat (NP)	20,728	25195	30624	37222	45243	54992	66842
201	Garhi Pukhta (NP)	11,748	14280	17356	21097	25642	31168	37884
202	Thana Bhawan (NP)	36,669	44571	54175	65849	80038	97285	118248
203	Jalalabad (NP)	27,921	33938	41250	50139	60943	74076	90038
	RAJASTHAN SUBREGION							
1	Alwar District							
204	Behror (M)	29,531	34421	36925	39612	42494	45586	48903
205	Neemrana (CT)	7,143	8326	8932	9581	10279	11026	11829
206	Shahjahanpur (CT)	9,837	11466	12300	13195	14155	15185	16290
207	Bhiwadi (M)	1,04,921	122295	131193	140738	150979	161964	173748
208	Tijara (M)	24,747	28845	30944	33195	35610	38201	40981
209	Tapookra (CT)	9,471	11039	11842	12704	13629	14620	15684
210	Khairthal (M)	38,298	44640	47888	51372	55110	59120	63421
211	Kishangarh (CT)	12,429	14487	15541	16672	17885	19186	20582
212	Ramgarh (CT)	13,529	15769	16917	18147	19468	20884	22404
213	Alwar (M Cl + OG)	3,22,568	375981	403338	432685	464167	497940	534170
214	Bhoogar (CT)	7,666	8935	9586	10283	11031	11834	12695
215	Diwakari (CT)	11,188	13041	13989	15007	16099	17271	18527
216	Desoola (CT)	7,306	8516	9135	9800	10513	11278	12099
217	Rajgarh (M)	26,631	31041	33299	35722	38321	41110	44101
218	Govindgarh (CT)	11,552	13465	14445	15496	16623	17833	19130
219	Kherli (M)	17,634	20554	22049	23654	25375	27221	29202
2	Bharatpur District							
220	Kaman (M)	38,040	44339	47565	51026	54739	58721	62994
221	Nagar (M)	25,572	29806	31975	34302	36797	39475	42347
222	Deeg (M)	44,999	52450	56267	60361	64752	69464	74518
223	Nadbai (M)	26,411	30784	33024	35427	38005	40770	43736
224	Kumher (M)	23,540	27438	29434	31576	33873	36338	38982
225	Bharatpur (M Cl + OG)	2,52,838	294705	316147	339151	363827	390300	418698
226	Bhusawar (M)	19,946	23249	24940	26755	28702	30790	33030
227	Weir (M)	19,385	22595	24239	26003	27895	29924	32101
228	Bayana (M)	38,502	44877	48143	51646	55403	59435	63759
229	Bayana (Rural) (CT)	5,866	6837	7335	7869	8441	9055	9714



Table D-2.3.5: Population for NCR Towns in Haryana and Rajasthan Sub-regions as per their respective Master Plans/ Development Plans

Table D-2.3.5 (A): Population for NCR Towns in Haryana Sub-region as per their respective Master Plans/ Development Plans

District	Development Plan	Status	Population (in lakh)	District	Development Plan	Status	Population (in lakh)
Karnal	Nilokheri-Taraori	FDP-2041	2.30	Jhajjar	Beri	FDP-2031	0.28
	Indri	FDP-2031	0.86		Jhajjar	FDP-2031	5.00
	Karnal	FDP-2025	9.00		Bahadurgarh	FDP-2041	7.37
	Gharaunda	RDDP-2025	1.17		Badsa	FDP-2041	1.27
	Assandh	FDP-2031	1.17	Mahendragarh	Mahendragarh	FDP-2025	1.00
Panipat	Panipat	FDP-2021	7.00		Narnaul	DDP-2021	2.50
	Samalkha	FDP-2021	0.67	Rewari	Rewari	FDP-2031	7.00
	Madlauda	FDP-2031	0.45		Manesar Bawal Investment Region (MBIR)	DDP-2039	33.15
	Israna	FDP-2031	0.20		Dharuhera	FDP-2021	2.00
Sonipat	Ganaur	RDDP-2025	1.75	Gurugram	Gurgaon-Manesar Urban Complex (GMUC)	FDP-2031	42.50
	Sonipat	DDP-2031	25.23		Gual Pahari	FDP-2021	0.19
	Gohana	RDDP-2021	1.50		Sohna	FDP-2031	6.40
	Kharkhauda	DDP-2041	5.81		Pataudi Haily Mandi	FDP-2031	1.90
Jind	Narwana	FDP-2021	1.27		Farukh Nagar	DDP-2031	1.25
	Uchana	DDP-2041	0.93	Mewat	Taoru	FDP-2021	0.45
	Jind	FDP-2031	6.68		Nuh	FDP-2031	0.90
	Safidon	DDP-2021	0.90		Ferozpur Jhirka	FDP-2021	0.46
Rohtak	Meham	DDP-2021	0.51	Palwal	Prithla	FDP-2031	1.22
	Rohtak	RDDP-2031	16.84		Palwal	FDP-2021	4.00
	Kalanaur	FDP-2031	0.74		Hodal	FDP-2031	1.71
	Sampla	FDP-2031	4.77		Hathin	DDP-2031	0.46
Bhiwani	Bhiwani	FDP-2025	3.60	Faridabad	Faridabad	FDP-2031	39.55
Charkhi Dadri	Dadri	FDP-2021	0.75				

Table D-2.3.5 (B): Projected Population for NCR Towns in Haryana and Rajasthan Sub-regions as per their respective Master Plans/ Deve. Plans

Sub- Region	District	Towns as per Master/ Development Plan	*2011	2016	2021	2026	2031	2036	2041
Rajasthan	Alwar	1. Alwar	322568	428784	535000	647500	760000	910235	1060469
		2. Greater Bhiwadi	104921	118057	131193	816707	1502221	2649800	3797379
		3. Khairthal	38298	54149	70000	76359	82718	107662	132605
		4. Kherli	17634	26317	35000	40000	45000	60424	75848
		5. Rajgarh	26631	33816	41000	46750	52500	63827	75154
		6. SNB	-	-	-	-	-	-	1820000
	Bharatpur	7. Tijara	24747	39874	55000	76962.5	98925	138427	177929
		8. Bharatpur	252838	310994	369150	377075	385000	457853	530705
		9. Deeg	44999	57000	69000	70500	72000	87389	102778
		10. Bayana	38502	47001	55500	63750	72000	85164	98328
		11. Kumher	23540	28410	33280	38140	43000	50445	57889
		12. Nadbai	26411	31456	36500	42250	48000	55765	63530
		13. Kaman	38040	43082	48123	54061.5	60000	67054	74107
		14. Weir	19385	23693	28000	32000	36000	42619	49237
		15. Nagar	25572	30786	36000	41500	47000	55038	63075
		16. Bhusawar	19946	24723	29500	34250	39000	46632	54263
HARYANA	Faridabad	1. Faridabad	1414050	2049390	2684729	3320068	3955407	4684870	5414332
	Gurgaon	2. Gurgaon Manesar Urban Complex (GMUC)	886519	1727390	2568260	3409130	4250000	5730763	7211526
		3. Sohna	36552	187414	338276	489138	640000	808206	976411
		4. Pataudi Haily Mandi	41324	79066	116807	154549	192290	225786	259281
		5. Farukhnagar	13513	41385	69257	97129	125000	244928	364856
		6. Gual Pahari	-	-	19000	0	0	0	0
	Jhajjar	7. Jhajjar	48424	161318	274212	387106	500000	657195	814389
		8. Bahadurgarh	170767	249076	327384	405692	484000	610500	737000
		9. Beri	15934	18951	21967	24984	28000	29978	31956
		10. Badsa	0	0	0	0	0	63500	127000
	Mewat	11. Tarou	22599	33800	45000	56201	67401	97868	128335
		12. Nuh	16260	34695	53130	71565	90000	103238	116475
		13. FerozpurJhirka	24750	35375	46000	56625	67250	88973	110695



Sub- Region	District	Towns as per Master/ Development Plan	*2011	2016	2021	2026	2031	2036	2041
	Palwal	14. Palwal	131926	265963	400000	534037	668074	1223802	1779529
		15. Hathin	14421	22316	30211	38106	46000	65645	85290
		16. Hodal	50143	80271	110398	140525	170652	249059	327466
		17. Prithla	-	-	-	-	122000	-	-
	Panipat	18. Panipat	295970	497985	700000	902015	1104030	658662	213294
		19. Samalkha	39710	53355	67000	80645	94290	125396	156501
		20. Madlauda	0	0	0	22500	45000	22500	0
		21. Israna	0	0	0	10000	20000	10000	0
	Rewari	22. Rewari	143021	282266	421511	560756	700000	910756	1121511
		23. Manesar Bawal Investment Region (MBIR) – (2039)	0	0	0	0	0	0	3315000
		24. Dharuhera	30344	115172	200000	284828	369656	469656	569656
		25. Rohtak	374292	701719	1029146	1356573	1684000	1902510	2121020
	Rohtak	26. Maham	20484	35742	51000	66258	81516	107016	132516
		27. Kalanaur	23319	27110	30900	52450	74000	89450	104900
	Sonipat	28. Sampla	-	-	28000	252500	477000	491000	505000
		29. Sonipat	289333	847750	1406167	1964584	2523000	3226084	3929167
		30. Ganaur–(2025)	35603	105302	175000	192802	210603	228405	246206
		31. Kharkhauda	25051	100270	175488	250707	325925	453463	581000
	Jind	32. Gohana	65708	107854	150000	182854	215708	290708	365708
		33. Jind	167592	254944	342296	505148	668000	804644	941288
		34. Narwana	62090	94545	127000	159455	191910	255410	318910
		35. Safidon	34728	62364	90000	117636	145272	167772	190272
	Karnal	36. Uchana	16815	29111.5	41408	53704	66000	79500	93000
		37. Karnal–(2025)	311062	605531	900000	977766	1055531	1318220	1580909
		38. Gharaunda–(2025)	37816	77408	117000	126454	135908	174988	214068
		39. Nilokheri- Taraori	17938	53954	89969	125985	162000	196000	230000
	Bhiwani	40. Assandh	27125	49594	72063	94532	117000	184620	252239
		41. Indri	17487	34688	51889	69090	86291	141968	197644
		42. Bhiwani–(2025)	196057	278029	360000	409015	458029	548029	638029
		43. Dadri	56337	65669	75000	84332	93663	108862	124061
	Mahendragarh	44. Mahendragarh–(2025)	29128	64564	100000	135436	170872	181818	192763
		45. Narnaul	74581	162291	250000	337710	425419	487919	550419

NOTE: *Population for year 2011 is as per Census 2011 for the then area of the city/town

Annexure-D-3.1

3. POLICY ZONES & LAND USE

BRIEF OF KEY INITIATIVE TAKEN BY GOVT. OF INDIA FOR BETTER LANDUSE PLANNING & DEVLOPMENT

1. “Land Use Planning” is multi-dimensional aspect derived from the complex inter-relationship of physical (space), ecology (existing system on the land); and human systems of land use (demographics, economic development, industrial, commercial, residential and societal needs, and law. The main purpose of land use planning process is to allocate land uses to meet the needs of people while safeguarding future resources. The term “land use” encompasses not only land use for agricultural and forestry purposes, but also more importantly for settlements, industrial sites, roads and other human activities.
2. Regional Land Use Plan provides for broad planning policies and proposals for designate the manner in which land in NCR is to be used for various purposes. The reservation of areas for specific land uses, which are of regional or sub-regional importance, will be detailed out in the Sub-Regional Plans, District Development Plans, Master/Development Plans and Gram Panchayat Development Plans, etc., which are to be prepared by the States within overall framework of Regional Plan.
3. Keeping in view the emerging scenario in planned development of cities and towns, MoHUA formulated the URDPF) Guidelines, 2014. For balanced development of all settlements with the region, the Guidelines provides framework for plan formulation at the regional and urban level.
4. MoHUA also launched AMRUT Scheme in 2015 which focused to establish and ensure adequate and robust



infrastructure, necessary for urban transformation through implementation of urban revival projects. Formulation of GIS-based Master/Development Plans² for 500 AMRUT Cities is one of the important reforms under AMRUT, which has been approved as a 100% centrally funded sub scheme with budget outlay of Rs. 515 crores for the purpose. TCPO, MoHUA has formulated “Design and Standards for formulation of GIS based Master Plan for AMRUT Cities”, 2016. It suggests utilisation of Very High Resolution Satellite (VHRS) data for preparing large scale urban base map at 1: 4000 scale or better. About 20 NCR cities/ towns have been identified for development and GIS based plan formulation under AMRUT (refer **Table-D-3.1.1**).

5. Smart Cities Mission is another major initiative of MoHUA, meant to set examples that can be replicated both within and outside the Smart City, catalysing the creation of similar Smart Cities in various regions and parts of the country. Three cities of NCR, namely, Delhi (NDMC), Faridabad and Karnal are being developed under this Mission.
6. Ministry of Panchayati Raj (MoPR) has formulated Rural Area Development Plan Formulation and Implementation (RADPFI), Guidelines, 2017 which provides specific land use provisions for rural areas. MoPR has also published Guidelines for preparation of Gram Panchayat Development Plans (GPDP)³ in 2018 for ensuring effective spatial planning at grass root level.
7. Ministry of Rural Development (MoRD) has prepared the Model Planning Guidelines⁴ for Rurban Cluster, 2019 which cover aspects such as Rural Landuses, Reserving Land for Public Purposes, Spatial Plan Making Process, development control mechanisms, service level benchmarks for utilities and services, funding and enforcement mechanisms for the preparation and implementation of the Integrated Cluster Action Plan (ICAP). There are 12 such clusters identified in NCR, being developed under the Rurban Mission.
8. Realising the importance of maintaining and preserving urban greens, TCPO, MoHUA has prepared the Urban Greening Guidelines⁵ 2014 which acts as a model for States and Cities. The Guidelines suggest practices and methods for protecting and enhancing urban greenery in a sustainable manner (refer **Annexure D-3.2**).
9. MoEF&CC has prepared the National Forest Policy of India (revised draft⁶ also prepared in 2018) which calls for promotion of trees outside forests and urban greens, as an effort to achieve 33% of India’s geographical area under forest and tree cover.

Table-D-3.1.1: AMRUT Cities in NCR

Sub-Region wise AMRUT Cities ⁷					
Delhi East Delhi MC New Delhi MC North Delhi MC South Delhi MC	Rajasthan Alwar Bhwadi Bharatpur	Haryana Bahadurgarh Bhiwani Faridabad Gurgaon/ Gurugram Jind	Karnal Palwal Panipat Rewari Rohtak Sonapat	Uttar Pradesh Baraut Bulandshahar Ghaziabad Hapur	Loni Meerut Modinagar Muzaffarnagar Shamli

²[http://amrut.gov.in/upload/uploadfiles/files/designandStandards_AMRUT\(3\).pdf](http://amrut.gov.in/upload/uploadfiles/files/designandStandards_AMRUT(3).pdf)

³GPDP Guidelines

⁴Model Planning Guidelines for Rurban Cluster, 2019 <http://rurban.gov.in/doc/Model%20Planning%20Guidelines%20for%20Rurban%20Cluster.pdf>

⁵[http://mohua.gov.in/upload/uploadfiles/files/G%20G%202014\(2\).pdf](http://mohua.gov.in/upload/uploadfiles/files/G%20G%202014(2).pdf)

⁶Draft National Forest Policy: https://smartnet.niua.org/sites/default/files/resources/draft_national_forest_policy_2018.pdf

⁷<http://amrut.gov.in/content/citiescovered.php>



Annexure-D-3.2

BRIEF OF URBAN GREEN GUIDELINES, 2014 OF TCPO, MOHUA**1. International Norms for Urban Green Spaces**

The quantum of green space required per capita varies in different contexts of the world. In the 20th century, experts in Germany, Japan and other countries proposed a standard of 40 sqm green space of high quality or 140 sqm suburb forest area per capita for achieving a balance between carbon dioxide and oxygen so as to meet the ecological balance of human well-being. Currently, developed countries have tended to adopt a general standard of green space of 20 sqm park area per capita. The World Health Organisation (WHO) recommends that cities should provide 9 sqm of undeveloped (unpaved) open space for every inhabitant. The WHO also suggests designing green area networks so that all residents live within a 15 minute walk to an open space. There is yet another yardstick, which refers to London but has relevance to any other city. Sir Patrick Abercrombie formulated the Greater London Plan in 1946 proposing that 1.62 Ha of open space per 1000 population was a reasonable figure to adopt for London. The plan also explained that all forms of open space need to be considered as a whole, and to be co-ordinated into closely-linked park system, with parkways along existing and new roads forming the links between the larger parks.

Aarhus, with a population of 0.3 million is the second largest city in Denmark. The Green Structure Plan was prepared as part of the planning reforms of the 1970s. The political vision of Aarhus surrounded by forest had strong public support. It has been used to control urban growth and to set standards; no dwelling should be more than 500 metres from a green area of at least 6,000 sqm. In terms of structural diversity, green spaces in urban systems should essentially be developed as networks. Three main components of urban forest and green spaces are: **Patch** (urban domestic gardens, public and private parks, gardens, urban forest patches, etc.), **Corridor** (roads, avenues, walkways and urban greenways) and **Network structure** (layout of all the patches and the corridors connecting the patches).

Green space coverage in cities varied markedly, averaging 18.6% and ranging from 1.9% (*Reggio di Calabria*, Italy) to 46% (*Ferrol*, Spain). Availability of urban green spaces per capita varied by two orders of magnitude, from 3-4 sqm per person in Cadiz, Fuenlabrada and Almeria (Spain) and Reggio di Calabria (Italy) to more than 300 sqm in Liege (Belgium), Oulu (Finland) and Valenciennes (France).

Urban tree cover in the *United States* ranges from 0.4% in Lancaster, California to 55% in Baton Rouge, Louisiana, containing approximately 3.8 billion trees with an average tree canopy cover of 27% of urban areas.

Curitiba, with a population of 17 Lakh (1.7 million), is one of Brazil's large cities. In the 1970s, growing population had reduced urban green space to 1 sqm per capita. A clear priority and consistent efforts by local authorities have successfully developed green spaces, which now measure 51.5 sqm per capita.

Canberra planned by Sir Walter Griffin has an extensive integrated network of open spaces that harbor more than 40% of the nationally listed threatened ecological vegetation. Despite development pressures, Wellington in New Zealand has 200 sqm per capita of green space.

Tokyo suffers from a shortfall of open space which averages 6.1 to 8.5 sqm per capita, but it has a large forest of 21,630 Ha to conserve water.

2. Policy Guidelines for strengthening Urban Greens**2.1 Roads**

The most common use of trees is on roads and avenues. If the wrong kinds of trees are planted at wrong locations or places, the safety of traffic is endangered. Therefore, it is necessary to lay down certain criteria before adopting any plantation scheme for roads.

While selecting trees species, the following criteria should be taken into account:

- i) Species should suit the soil and climatic conditions.
- ii) Species should be hardy, robust and need little attention once they have achieved certain growth.



- iii) Species having long life should be preferred.
- iv) The species must be either evergreen or nearly evergreen or be leafy during summer.
- v) The species must be fast growing and wind resistant.
- vi) The trees should be deep rooted; shallow roots injure pavements.
- vii) The species should not be allowed to grow into a very large size requiring expensive pruning
- viii) The species should be capable of easy transplantation.
- ix) The commercial, aesthetic and social values of species should also be considered.

The main function of a roadside avenue is shade. Hence, trees which are quick-growing and provide dense shade should be selected. The trees selected should provide shade not only on the sides, but also in the center of the road. From this point of view, trees with, an umbrella or semi-umbrella crown like sprovide shade they also yield valuable timber and fruit. The trees should be planted in such a way that their crowns may develop freely. Where the road is more than 30 meters wide, a double avenue of trees with the outer avenue near the edge of ROW line may be used.

Planting of trees along roads may be in the following manner:

1. Avenue Planting
2. Group Planting
3. Informal Planting

The planting should be suitable for different locations. The following general guide lines are useful in selecting tree types.

2.2 Avenue Plantation

Avenue planting consists of planting areas in single or double rows along highways. Long avenues may become monotonous and where travel speeds are high, may induce drowsiness. This may be overcome by planting at irregular intervals of say 30-75 metres and by off-setting the trees by 1 to 1.5 m from a uniform alignment. Avenue planting will take a distinct form of treatment on curves and undulating contours. In large cities and locations, where, land is available double avenues of trees may be provided. On divided carriageway having separate pedestrian footpath, the outer rows consisting of shady trees and inner row consisting of ornamental flowering trees may be adopted.

2.3 Group Plantation

Group planting consists of planting a clump of 3 or 4 trees along the highway overcomes the monotony of avenue planting. To be more effective the spacing of group should not be uniform. This should be staggered on opposite sides of the road.

2.4 Mixed Plantation

Mixed planting consists of selecting different varieties of trees, rather than one single variety. This system avoids monotony of single variety planting. The shedding of leaves takes place in different seasons. The plants provide flowers and fruit in different seasons and thus the aesthetic value of avenues is preserved throughout. During storm, when wind velocity is high, the harder varieties will survive and will protect the weaker varieties too.

2.5 Informal Plantation

In urban fringe settings, avenue planting may include formal landscape on an otherwise informal one. Single trees may be featured where practicable, providing visual interest.

2.6 Spacing of Trees

No hard and fast rule may be laid down for the spacing of avenue trees; it depends on the type of trees. A minimum spacing of 10-12 m should be followed. The trees in the formal avenue planting should be planted in rows on either side of the road in a staggered manner. At urban intersections the trees should be at least 3 m away from the intersections for right viewing distance.



Annexure-D-3.3

DESCRIPTION OF LAND USE AND LAND COVER CLASSES, AS PER BHUVAN PORTAL OF NRSC, ISRO

LULC classification scheme⁷ and brief description of classes are as given hereunder:

1.0 BUILT-UP LAND

It is an area of human habitation developed due to non-agricultural use and that has a cover of buildings, transport and communication, utilities in association with water, vegetation and vacant lands. Web LULC map consists of 3 classes under built-up viz., urban, rural and mining.

- 1.1 **Urban:** Urban areas are non-linear built up areas covered by impervious structures adjacent to or connected by streets. This cover is related to centers of population. This class usually occurs in combination with, vegetated areas that are connected to buildings that show a regular pattern, such as vegetated areas, gardens etc. and industrial and/or other areas. (FAO, 2005). It includes residential areas, mixed built-up, recreational places, public / semi-public utilities, communications, public utilizes/facility, commercial areas, reclaimed areas, vegetated areas, transportation, industrial areas and their dumps, and ash/cooling ponds.
- 1.2 **Rural:** These are the lands used for human settlement of size comparatively less than the urban settlements of which the majority of population is involved in the primary activity of agriculture. These are the built-up areas, smaller in size, mainly associated with agriculture and allied sectors and non-commercial activities. They can be seen in clusters non-contiguous or scattered.
- 1.3 **Mining:** Mining areas encompass area under surface mining operations. The recognizable impacts of these activities on the landscape are unmistakable giant pit mines covering vast areas. The presence of water bodies does not necessarily imply inactive or unused extractive areas; ponds or lakes are often an integral part of an extractive operation. (USGS, 1999) It includes surface rocks and stone quarries, sand and gravel pits, brick kilns, etc. These are areas of stockpile of storage dump of industrial raw material or slag/effluents or waste material or quarried/mixed debris from earth's surface.

2.0 AGRICULTURAL LAND

These are the lands primarily used for farming and for production of food, fiber, and other commercial and horticultural crops. It consists of:

- 2.1 **Cropland:** These are the areas with standing crop as on the date of Satellite overpass. Cropped areas appear in bright red to red in color with varying shape and size in a contiguous to non- contiguous pattern. They are widely distributed indifferent terrains; prominently appear in the irrigated areas irrespective of the source of irrigation. It includes kharif, rabi and zaid crop lands along with areas under double or triple crops.
- 2.2 **Plantations:** These are the areas under agricultural tree crops planted adopting agricultural management techniques. Depending on the location, they are exhibit a dispersed or contiguous pattern. Use of multi-season data will enable their separation in a better way. It includes agricultural plantation (like tea, coffee, rubber etc.) horticultural plantation (like coconut, arecanut, citrus fruits, orchards, fruits, ornamental shrubs and trees, vegetable gardens etc.) and agro-horticultural plantation.
- 2.3 **Fallow:** An agricultural system with an alternation between a cropping period of several years and a fallow period. (Ruthenberg, 1980). In another terms these are the lands, which are taken up for cultivation but are temporarily allowed to rest, un-cropped for one or more season, but not less than one year.

3.0 FOREST

The term forest is used to refer to land with a tree canopy cover of more than 10 percent and area of more than 0.5 ha. Forests are determined both by the presence of trees and the absence of other predominant land

⁷Source: <https://bhuvan-app1.nrsc.gov.in/2dresources/thematic/LULC503/lulc.pdf>



uses. The trees should be able to reach a minimum height of 5 m (MOEF, 2011). It consists of:

- 3.1 Evergreen/Semi-Evergreen:** This term as such describes the phenology of perennial plants that are never entirely without green foliage (Ford-Robertson, 1971). This category comprises of tall trees, which are predominantly remain green throughout the year. It includes both coniferous and tropical broadleaved evergreen species. Semi-evergreen is a forest type that includes a combination of evergreen and deciduous species with the former dominating the canopy cover.
- 3.2 Deciduous:** This applies to the phenology of perennial plants that are leafless for a certain period of the year (Ford-Robertson, 1971). The leaf shedding usually takes place simultaneously in connection with the unfavorable season (UNESCO, 1973).
These are the forest types that are predominantly composed of species, which shed their leaves once a year, especially during summer. It also includes tree clad area with tree cover lying outside the notified forest boundary areas that are herbaceous with a woody appearance (e.g. bamboos, palms, tree ferns etc.).
- 3.3 Forest Plantation:** These are the areas of tree species of forestry importance, raised and managed especially in notified forest areas. The species mainly constitute teak, Sal, eucalyptus, casuarina, bamboo etc.
- 3.4. Scrub Forest:** These are the forest areas which are generally seen at the fringes of dense forest cover and settlements, where there is biotic and abiotic interference. Most times they are located closer to habitations. Forest blanks which are the openings amidst forest areas, devoid of tree cover, observed as openings of assorted size and shapes as manifested on the imagery are also included in this category.

4.0 GRASS/GRAZING LAND

These are the areas of natural grass along with other vegetation, predominantly grass like plants (Monocots) and non-grass like herbs (except Lantana species which are to be classified as scrub). It includes natural/semi natural grass/ grazing lands of Alpine/Sub-Alpine or temperate or sub- tropical or tropical zones, desertic areas and manmade grasslands.

5.0 WASTELANDS

Described as degraded lands which can be brought under vegetative cover with reasonable effort and which is currently underutilized and land which is deteriorating for lack of appropriate water and soil management or on account of natural causes. It consists of:

- 5.1 Salt-Affected Land:** Generally characterized as land that has excess salt in the soils with patchy growth of grasses.
- 5.2 Gullied/Ravinous Land:** They are the resultant of terrain deformation due to water erosion which occurs widely in all agro-climatic zones. Gullies are formed as a result of localized surface run-off affecting the unconsolidated material resulting in the formation of perceptible channels causing undulating terrain. They are mostly associated with stream courses, sloping grounds with good rainfall regions and foothill regions. These are the first stage of excessive land dissection followed by their networking which leads to the development of ravinous land. Ravines are basically extensive systems of gullies developed along river courses.
- 5.3 Scrub Land:** These areas possess shallow and skeletal soils, at times chemically degraded extremes of slopes, severely eroded or subjected to excessive aridity with scrubs dominating the landscape.
- 5.4 Sandy Area:** These can occur in coastal, Riverine or inland areas. Desertic sands are characterized by accumulation of sand developed in situ or transported by Aeolian processes. Coastal sands are the sands that are accumulated as a strip along the sea coast. Riverine sands are those that are seen as accumulations in the flood plain as sheets which are the resultant phenomena of river flooding.
- 5.5 Barren Rocky/Stony Waste:** These are rock exposures of varying lithology often barren and devoid of soil and vegetation cover.

6.0 WETLAND / WATER BODIES

All submerged or water-saturated lands, natural or man-made, inland or coastal, permanent or temporary, static



or dynamic, vegetated or non-vegetated, which necessarily have a land-water interface, are defined as wetlands. It consists of:

- 6.1 Inland Wetlands:** These are the areas that include ox-bow lakes, cut-off meanders, playas, marsh, etc. which are seasonal as well as permanent in nature. It also includes manmade wetlands like waterlogged areas (seasonal and perennial).
- 6.2 Coastal Wetland:** These include estuaries, lagoons, creek, backwater, bay, tidal flat/mud flat, sand/beach, rocky coast, mangrove, salt marsh/marsh vegetation and other hydrophytic vegetation and saltpans.
- 6.3 River/Stream/Canals:** Rivers/streams are natural course of water flowing on the land surface along a definite channel/slope regularly or intermittently towards a sea in most cases or in to a lake or an inland basin in desert areas or a marsh or another river. Canals are artificial water course constructed for irrigation, navigation or to drain out excess water from agricultural lands.
- 6.4 Water Bodies:** This category comprises areas with surface water in the form of ponds, lakes, tanks and reservoirs.



Annexure-D-3.4

A BRIEF NOTE ON LAL DORA, ITS PROSPECTS AND CONSEQUENCES & PAST EFFORTS TO BETTER THE PROSPECTS WITH A WHOLISTIC VIEW

1. The term 'Lal Dora' came into existence in 1908 during the British rule. It was used to classify that portion of the village land which is part of the village 'abadi' (habitation). Such lands are supposed to be used for the non-agricultural purpose only and are exempted from building by-laws.
- 1.1 Revenue Settlement was carried out in Delhi in the years 1908-1909 and the lands earmarked for village abadi and those meant basically for agricultural purposes were duly demarcated. The Village Abadi i.e., essentially the residential (Ghar Gitwar) component of the community was shown in the village map circumscribed in red ink. The Abadi deh thus came to be known as Lal Dora in common parlance. Lands falling within village abadi (Lal Dora) were not assessed to land revenue. The agricultural fields outside the village abadi were subject to land revenue. Villagers of Delhi, as villagers elsewhere, depended predominantly on agriculture.
- 1.2 Deluge of refugees as an aftermath of partition coupled with natural increase in population and in-migration from the rest of the country, led to extensive fragmentation in these rural pockets, making the holdings uneconomical. Essentially to meet these fresh challenges, Punjab enacted a new law providing for compulsory consolidation of holdings of agricultural land. This Act was extended to the Union Territory of Delhi in 1951. Under the provisions of this Act, the work of consolidation of Holding was initiated in some of the villages from 1951 and completed in 102 villages by the year 1954. Thereafter, Delhi Land Reforms Act 1954 was enacted and came into force in Delhi. The East Punjab Holding (Consolidation & Prevention of Fragmentation) Act 1948 which continued to remain extended to Delhi, was also amended to provide for extension of village abadi while undertaking Consolidation of Holdings.
- 1.3 Among the objectives were to (a) Enable extension of village abadi, and (b) Provide a source of income for the Village Panchayat and for benefit of the village Community. In the Rules framed under the Consolidation Act, common purposes were specified as follows: "Pasture lands, cremation or burial grounds, Khalian, land for keeping cattle, fisheries, tanks, skin flaying center, public latrines, fuel plantation, water channels, training places, well for drinking purpose, sewage tank, market, mela ground, rural dispensary, veterinary center, village theatre, guardwara, temple, mosque or church, drains, community orchards, community center, young farmers club, etc."
- 1.4 Consolidation operations were taken up next in the year 1970 and 70 villages were covered. This programme was included in the Third Five Year Plan of Delhi and Plan funds were provided. The 102 villages covered during 1951-54 could not be benefited in this manner since the relevant legal enabling provision did not exist at that time.
- 1.5 It would thus be seen that Consolidation work was taken up sporadically, instead of being a continuing exercise to cover all the villages although phenomenal increase in population continued leading to rapid urbanization and generating tremendous pressure on land and squeezing of rural population within the Lal Dora. Timely relief by way of extension of Lal Dora, while land was still available around the villages, could not be provided to the villagers of Delhi. It was only in a few villages that Phirni or Extended Lal Dora was provided.
- 1.6 Consolidation operations in 1970 led to extension of Lal Dora and provision for the needed community services (like additional house sites, pathways, Phirni, School, hospital, community services etc.) was made. As a result, the value of land in such villages rose considerably. However, situation has deteriorated even in these villages in the intervening over decades. In other villages where Abadi was circumscribed almost a century back (in 1908-1909), the situation is pitiable. In small houses more than 15 to 20 people and the animals are living together leading to serious health hazards. The position is that on the one hand



the space within Lal Dora has become grossly insufficient to meet the rising needs and aspirations of the increasing population and on the other, the land inside Lal Dora cannot (on pain of punishment under the Delhi land Reforms Act, 1954) be put to any use other than agriculture.

2. Short review of Delhi Land Reforms Act, 1954:

A preamble to the Delhi Land Reforms Act, 1954 shows that the said Act was enacted for the modification of Zamindari System so as to create a uniform body of peasant proprietor without intermediaries for the unification of the existing tenancy laws. Various provisions of the Act show that the said Act was primarily enacted for agriculture land. Section 3 (13) of the Act defines land as the land which is held or occupied for the purpose of agriculture, horticulture, animal husbandry, pisciculture and poultry farming.

- 2.1 The Act did not envisage large scale urbanization or unauthorized colonization of agriculture land. Delhi is a prime urban centre of the country, being national capital. However, with continued pressure of population moving from villages to urban areas and from smaller towns to bigger towns coupled with expansion of village abadi, there is a strong demand for land for the purposes of housing / non-agriculture activities.
- 2.2 The Act was not created to address this demand, its objective was agriculture. Urbanization is, however, being regulated and controlled by another law - Delhi Development Act, 1957. Delhi Development Authority has been involved both in planning and development.
- 2.3 Use of land for any purpose other than agricultural and connected activities like horticulture, animal husbandry, pisciculture, poultry farms is penalized under Section 81/82 of the Act. Incidentally, there is a provision for diversion of agriculture land but to industrial use only. Section 23 deals with 'use of holdings for industrial purposes' and provides that the Chief Commissioner (now Lt. Governor) may, on application presented to the Dy. Commissioner sanction the use of any holding or part thereof by a Bhumidar for industrial purposes even though it does not lie within such a belt. There is hence a need to repeal/amend/ review such provisions so that there is a route of planned development available to the public. This would enable in guiding the process of urbanization and development.
- 2.4 It is noted that despite the existence of a provision to vest the land on account of colonization, large scale colonization has taken place in Delhi as reflected in number of colonies that have mushroomed. On the one hand, therefore, it is essential that the government provides a route for development to public as per planning norms and on the other, it provides for stringent provisions to act/ penalty against illegal colonizers,
- 2.5 Section 33 of the Act deals with 'Restrictions on the transfer by a Bhumidar' and is meant to prevent fragmentation of holding. It states that no Bhumidar shall have the right to transfer land whereas a result of such transfer, the transferor shall be left with less than eight standard acres in the Union Territory of Delhi. This provision, in the face of growing urbanization and population and the resultant fragmentation of ownership, is outdated and needs deletion.
- 2.6 Section 55 to 61 of the Act deal with partition of holdings. For partition of holdings, a Bhumidar has to file a suit but conditions prescribed in the Act severely restrict such request for partition. These provisions retard colonization on one hand but also create hassles for the land owners by not allowing a clear individual title/ share. However, in today's time there is a need to have clarity of title/ ownership between the co-owners.
- 2.7 Section 85 of the Act provides for conferring the rights of Bhumidhari to the occupant of Agricultural land. This provision encourages dishonesty as an illegal occupant gets legal basis to grab the land of gaon sabha or a bhumidhar on the basis of possession. The Supreme Court has deprecated such system in a Judgement dated 23.09.2008 in Civil Appeal No. 1196/2007 (Hemaji Waghaji Jat Vs Bhikhabhai Khengarbhai Harijan & others). Section 85 of the Act was essentially meant towards recognizing the rights of a tiller. But now it promotes dishonesty. As such Section 85 of the Act may be deleted.
- 2.8 Likewise Section 86A of the Act, though providing for ejectment of encroacher, provides for a limitation period of just three years. This only facilitates land grabbers. In its judgment dated 28.01.2011 in Civil Appeal No. 1132/2011 and SLP © No. 3109/2011 (Jagpal Singh & others Vs State of Punjab & others),



the Supreme Court has advocated strict action against encroacher and observed that long duration of illegal occupation or huge expenditure on making constructions thereon or political connections must not be treated as justification for condoning the illegal act or for regularizing illegal possession.

3. Expert Committee on Lal Dora and ELD, 2007

- 3.1 MoUD, GOI had constituted the Expert Committee in 2007, to address the long-standing problems of the villages of Delhi that had been swept into the backwaters of progress by the torrent of urbanisation. Key objective was improving the living conditions and environment in the villages and bringing before the village-people unprecedented opportunities of enhancing their prosperity. As of that time, the village-abadis of Delhi - 227 rural and 135 urbanised – had been circumscribed by Lal Dora. Confined as it were by the Red Line, both in the literal and figurative sense, they have got reduced to cramped, unhealthy pockets, lacking largely even in the basic civic services. Surrounding agricultural lands, fields and farms, the traditional and principal base for their livelihood over the ages, were taken away for a pittance and resold at huge profit. Little proportion, was invested in introducing the basic-most civic services (water-supply, sewerage, solid waste management systems etc) to them. Little attention was paid to facilitate and smoothen their transition to alternate means of livelihood.
- 3.2 The choice before them for sheer survival was either to earn as best as they could from their land/property or to let their younger generation take to dubious get-rich-quick ways of life. The innate maturity and high value system of our rural folk, they chose the former. Deprived of land for agriculture and facilities for keeping cattle, they were driven to opening shops, starting small industries wherever they could; renting out their premises for godowns, offices and the like. Some were tempted to sell off their lands at prices, seemingly high but just a fraction of their real intrinsic potential value.
- 3.3 The Committee felt, strongly that the solution lied not in making futile attempts at resisting the wave of urbanisation in Delhi, but in taking the maximum advantage of the opportunities that urbanisation has to offer. It was felt that the national capital's urbanisation with as intensive use of land as is possible to accommodate its present population and the addition in future, is inevitable. At the same time it must be ensured that sub-standard pockets (villages, unauthorised colonies, slums, JJ-clusters etc), as well as our heritage areas including the Old City be developed or redeveloped with wide street pattern and clean and decent living spaces, limited 24-point mixed land-use (as recently approved by the Hon'ble Supreme Court) and ample commercial spaces adequate for the present and future, are planned for and provided. All this must be done while retaining the green character of Delhi, improving the aesthetics and conserving, improving and beautifying our heritage sites and places of healthy recreation.
- 3.4 It was also advised that with increase in population and limited space, one has to shed the reluctance in going vertical. Liberty and opportunity to private sector has to be provided if the dream of making Delhi a world class metropolis is to come true.
- 3.5 **Amongst its various aims was:**
 - Providing modern, decent living accommodation to all the present residents of villages and for natural increase in the future;
 - Building up of proper urban infrastructure for better health & hygiene;
 - Integration of sub-standard decayed pockets (Lal Dora/urban villages etc) with the surroundings of planned proper residential colonies and commercial areas;
 - Quick enrichment of the villagers through optimally intensive utilisation of their land - vacant and built up - that will enhance its value several fold through: self-effort if they are prepared to invest in development OR; adopting PPP-route where land-owners are the main beneficiaries without making any investment.
4. Observations of the Hon'ble Supreme Court (in the case of M.C. Mehta vs. UOI) was that exemptions given to rural villages did not extend to villages notified as urban villages under Section 507 (a) of the DMC Act.



God forbid, if a disaster like fire or earthquake occurs, the narrow roads and the twisting streets would seriously hamper fire fighting, emergency rescue, relief and casualty evacuation operations.

5. Prospects of Lal Dora land, from buyers/seller perspective

- 5.1 Economical rates: Property rates in Lal Dora regions are comparatively cheaper than the authorised areas of Delhi due to non-availability of social amenities such as parks and well-maintained roads which are present in authorised areas.
- 5.2 Strategic location: Properties in such areas have gained popularity due to their strategic location. For instance, builder floors in some parts of Uttam Nagar in West Delhi are constructed on Lal Dora land. The area is situated close to the Janakpuri Central Business District (CBD), and Uttam Nagar East and Uttam Nagar West metro station owing to which, it magnetises homebuyers as well as tenants looking for properties within a specified budget.
- 5.3 No stringent norms and regulations: Under the Delhi Municipal Act, Lal Dora land has been exempted from the building bye-laws and stringent construction norms and regulations. This implies that there is no requirement to get the building sanction plan approved for construction on such lands. Further, according to the Delhi Master Plan, plots measuring more than 1,500 sqm. ft. ie 150 sq. m. approx are permitted to be redeveloped into multi-storey apartments which have attracted several small-scale developers to enter into agreements with owners of such lands. Due to this, the housing supply in such regions has surged over time., but is haphazard in nature.
- 5.4 No property tax: Owners of up to 200 sq m plots and houses on Lal Dora save 100 percent tax since such properties are exempted from property tax.

6. Proposed Interventions in Draft Regional Plan 2041

- 6.1 Lal Dora (LD) and extended Lal Dora (ELD) in Delhi and other parts of NCR have been presenting a chronic problem specifically due to complex mix of very old revenue and municipal laws. Despite interventions by various courts and even by the Hon'ble Supreme Court situation in these areas has continue to deteriorate. Delhi today has for long had over 200 sub-standards, cramp pockets of insanitation and haphazard growth which have grave threats of fire safety and possibilities of clandestine ways of earning money. Tajinder Khanna Committee Report and the report of the Expert Committee (2007) on LD & ELD in Delhi have highlighted in detail the complex situations in these areas. TDR and transferable FAR shall be given in such areas as rational mechanism to implement this.
- 6.2 The Expert Committee (2007) has recommended the FAR of 400 to 500 with 40% ground coverage for plot sizes 2000/4000 sq. mt. and above respectively to enable group housing for the residents of the villages to pool their small plots for high-rise group housing with minimum 12 mt. wide road. The Committee have repeatedly recommended mixed land use in such areas except villages with heritage structures and those in reserve forest and ridge area which need special planning and development. It is now proposed that the relevant revenue law and municipal law which were framed more than 50 years ago should be reviewed according to the current times and future requirement of Delhi and NCR.
- 6.3 Accordingly, for the harmonious development it is recommended that the Delhi Land Reform Act, 1954 may be repealed/ reviewed/ amended/ to give the same rights to its villagers as in the villages of NCR States adjacent to Delhi, in terms of usage of the land, mortgage, transfer, end usages post transfer, dwelling units improvement, mixed use of the land, etc. In fact it will be more suitable to repeal land reforms act and t mainstream these areas with other parts of Delhi . These villages of lal dora and extended lal dora land should be also brought under the planned development of DDA and respective DMC. However, the villages area with special character like heritage structure should be developed with special heritage zone and settlements in reserve forest or in ridge area should be developed with appropriate tourism/conservation activities as per provision indicated in the heritage and conservation of development provision of this chapter or as per the policies of MoEF&CC regarding forest settlement/ridge area.



- 6.4 It is also recommended that redevelopment of Lal Dora and extended Lal dora be undertaken rigorously as in other areas of Delhi for a harmonious development.
- 6.5 This shall enable Lal Dora and extended Lal Dora areas to smoothly integrate in mainstream Delhi's growth, since all other efforts since 1980s have not been fully successful.

7. **Conclusion:**

- 7.1 Hence, as archaic laws like Delhi Land Reforms Act etc. hold back development and create islands of chaos like Lal Dora, ELD etc., and repeal of Delhi Land reforms act 1954, is necessary to enable organised and orderly development of hitherto rural areas of Delhi in harmony with their surroundings inside and outside Delhi. This is necessary since despite many committees in last many decades, the Lal dora and extended Lal Dora areas continue to remain anachronistic islands of haphazard, chaotic development in the midst of planned areas.
- 7.2 This also goes with the comprehensive GoI initiative to do away with old, redundant, archaic laws from the statute books

Source:

- <http://revenue.delhi.gov.in/wps/wcm/connect/afea8b004cf9a267bc5bfebe4f3d39ce/DLR+Amendment+%28English%29.docx?MOD=AJPERES&lmod=-1593278388>
- <http://mohua.gov.in/upload/uploadfiles/files/laldora.pdf>
- <https://www.indiacode.nic.in/bitstream/123456789/14644/1/1954delhi8.pdf>



Annexure-D-4.1

4. ECONOMIC GROWTH

Brief Economic Scenario of NCR and its Participating States

1. NCR has over the past decade, emerged as one of the foremost economic centres in India. It contributes significantly to India's growth, accounting for about 7-8% of the total GDP.

Table D-4.1.1 GDP of NCR from 2011-12 to 2016-17 at Constant Prices of 2011-12 (In INR Millions)

Sub Region	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	CAGR (2016-17)
NCT Delhi*	34,37,975	36,66,284	39,29,084	42,83,551	47,56,225	51,15,042	8.27%
Haryana#	1,23,65,308	1,34,71,867	1,44,11,884	1,54,29,452	1,69,08,189	1,84,24,533	8.30%
UP	11,98,387	12,39,339	13,65,353	16,15,960	18,15,862	20,05,876	10.85%
Rajasthan	45,85,297	44,56,458	45,08,557	46,69,820	50,95,289	54,54,605	3.53%
NCR	2,15,86,967	2,28,33,948	2,42,14,878	2,59,98,783	2,85,75,565	3,10,00,056	7.38%

Source: NCR Monitoring and Planning Cells, Govt of NCT Delhi, UP, Govt of Haryana and Govt of Rajasthan

*Ministry of Statistics and Programme Implementation, Govt. of India.

#Total excluding district Gurugram, Mewat, Palwal&Rewari

2. Delhi-NCR region is considered as one of the top three economic hubs of India. Delhi NCR with 370 Billion USD is the largest economy in India and contributes about 8% to National economy and pulls a huge number of workers from across the country. Delhi-NCR region attracted about one-fourth (25%) of FDI received by the country during April-December 2018-19. Delhi region is considered as one of the top three economic hubs of India. Delhi NCR with 370 Billion USD is the largest economy in India and contributes about 8% to National economy and pulls a huge number of workers from across the country.
3. FDI inflows for Delhi region rose from Rs. 44,713.15 Cr. (US \$5.9 billion) in 2016-17 to Rs. 58,346.75 Cr. (US \$7.7 billion) in 2017-18 and Rs. 76,556.48 Cr. (US \$10.1 billion) in 2018-19.
4. FDI inflows in Delhi, including part of Uttar Pradesh and Haryana, stood at US\$ 74.150 billion from April 2000 to September 2017.
5. NCR constituent State wise details are provided as follow:

1. **Economic scenario of Delhi:**

- 1.1. The Gross State Domestic Product (GSDP) growth of Delhi was 8.1% in 2017 and the services sector contributed 85% to the state economy, followed by manufacturing at 12% and agriculture at 3%. As per new Industrial Policy for Delhi 2010-21, government is keen on developing and promoting the high-tech, sophisticated, knowledge-based IT and ITeS industries in the state. The government has planned to set up a "Centre of Excellence" to promote innovation and entrepreneurship in the sectors to achieve this aim. According to the Department of Industrial Policy & Promotion (DIPP), NCT Delhi allocated a plan outlay of US\$ 340.5 million for the development of the energy sector in the state and US\$ 483.1 million was allocated to housing and urban development in 2017-18.
- 1.2. It is also observed that Growth Rate of GSDP of Delhi, which indicates performance of Economy is 8.61% during 2018-19, while it is 6.8% at National Level. Delhi has highest Per Capita Income in the Country and for the year 2018-19, it is Rs. 36,5529/- which is three times of the -National average of Rs. 126406/. Annual rate of growth is more than 12%. Delhi contributes 4% to the National Economy though its population share is only 1.4% and it's economy grew at 8.36% annually in the last 07 years, whereas the same is 7.1 % at All India Level (Base Year 2011). Targets fixed for perspective year 2030 are listed below in Box



Box D-4.1.1 Future Perspective 2030 of Delhi: Taargets of some Growth Indicators

- a) Target of Economic Development Indicators: Annual Growth Rate to increase from 7.54 % in Base Year 2016-17 to 9.85 % upto 2030
- b) Per Capita Income to consistently Grow at the annual growth rate of 7.95% from present level.
- c) Access to Formal Credit to increase to 40 % in 2030 from 4.03 % in 2016-17
- d) Share of Formal sector Employment to Total Employment to increase to 50 % in 2030 from 4.25 % in 2016-17
- e) Unemployment Rate to decrease to 2.5% in 2030 from the 3.06 % in 2016-17
- f) Females in NEET (Not in Education, Employment, or Training -15 to 29 Years) : to be reduced to 20% from present 40%
- g) Males in NEET (Not in Education, Employment, or Training -15 to 29 Years) : to be reduced to 2% from present 7% (as envisaged in draft Delhi Vision 2030 under SDG Framework)

The percentage contribution of Primary Sector (Agriculture and Allied) to the Gross State Value added at basic prices has declined from 0.94 % in 2011-12 to 0.39 in 2017-2018. The contribution of Secondary Sector (Industry Sector) and Tertiary Sector (Service sector) has been variable in between, from 2011-12 to 2017-2018 though further leading to 15.91% and 83.70% in 2017-2018. In NCT Delhi highest employment is generated in Textile sector .68%)

- 1.3. The percentage change of per capita income at constant prices in Delhi has been increased from 4.22% in 2011-2012 to 6.07% in 2017-2018. However, the percentage change of per capita income at current prices has been declining from 11.45% in 2011-2012 to 9.41 % in 2017-2018.
- 1.4. Delhi is a major trading and Education hub and multicultural city in the Country. It has excellent public Infrastructure & Communication facility for promotion of Business. Consistent good fiscal health, around 90-95% of Govt, of NCTD Budget is financed from its internal resources. Service Sector contribution is the highest to Delhi's Economy i.e 84.12 % in 2018-19. These are the strengths of Delhi's Economic Growth. Delhi scored 100 in the index on SDG 9: Industry Innovation & Infrastructure by NITI AAYOG in its SDG India Index 2.0 released on 30th Dec, 2019. Major contributions of different service sectors activities to Delhi Economy in 2018-19 as per Advance Estimates: Professional Services & Real Estate (28%), Transport, storage & Communication (14.70%), Financial Services (13.79%), Trade, hotels & Restaurants (12.44%), etc.
- 1.5. In Delhi highest employment is generated in Textile industries (46.68%) whereas the highest turnover is generated from engineering equipment industry (40.60%). Higher no. of industrial estates can be found in North West (7) followed by South West districts (5).
- 1.6. Higher number of mandis are there in North west district (6) followed by East Delhi district (3) South West district (2) and North East district (1). South Delhi (SDMC) has 51 informal markets and the total no of sellers are 4410.

2. Economic scenario of Haryana Sub-Region:

- 2.1. Haryana is important contributor to NCR and the entire country. As per FY 2018-19 report, it contributes around 3.32% to the GDP of the country. Haryana is third in ease of doing business and doing well on economic front. For example, Gurugram which is the original hub of the automobile industry of the country since Maruti 800 launch. The city is popularly known as "Cyber City" and "Millennium City" with large number of IT companies. City has been witnessing a substantial growth in the economy with rise of information technology, ITeS, pharmaceuticals and automobile industries. Many multi-national companies have their branches in Gurgaon considering it a best place to operate business. Gurgaon is home to many global giants such as Microsoft, Oracle, American Express, IBM, Price Waterhouse Coopers, McKinsey and Company, Google, Dell, Ericsson and Motorola. It is also the manufacturing base of the Maruti Suzuki and Hero Honda groups.
- 2.2. With regard to MSME sector, the State has more than 1 lakh registered MSMEs contributing to about 20,000 crore of investment and providing employment to 10 lakhs of people. The is ease of business for MSME conducive eco-system for growth, statutory plans which needs futher attention.



- 2.3. Government of Haryana has followed macro approach such as Focusing on fiscal reforms and digitisation, holding Pre-budget sessions with stakeholders for discussion on budgetary reforms, attempting to build an accurate database expected to be linked to the services that are to be delivered to the public, etc. Besides, focus areas also include the sex ratio & women empowerment in the State.
- 2.4. Haryana is placed at number 3 as per World Bank ranking regarding Ease of doing business in year 2019 with GDP of 6%, GSDP of USD 75.3 billion, Growth rate at 11.79% and Per capita income of 2963 USD. Strategic factors such as proximity to large market and manufacturing zones makes Haryana an obvious choice for setting up Logistics hubs and Warehouses.
- 2.5. Key developments in Harayna includes:
- (i) **Panchgram City development across KMP Global Corridor** - Developing 05 new cities in an area of 2.5 lac hectares as part of 'Panchgram' vision with each city expected to accommodate on an average ~ 15-18 lac population based on the trends of rapid urbanization. Core group has been constituted to develop these five new cities around Kundli- Manesar- Palwal corridor and the Panchgram Authority has been vested with required powers so as to expedite and fast track the project completion.
 - (ii) **Global City at Gurugram**-Located in Delhi NCR as part of the Manesar Urban Development Complex, including 1000 acres of land under DMIC. With high density and Mixed Land use the area has dominance of manufacturing units, and service hub in close proximity. As per State's estimates the area has investment potential of about US \$ 15 billion (Rs. 1 lakh crore). Regarding its implementation a Joint venture of HSIIDC and DMICDC- SPV incorporated DMIC Haryana Global City Project has been created.
 - (iii) **Integrated Multi Modal Logistics Hub** to be developed as the largest logistics hub in North India over 1200 acres at Nangal Chaudhary, Narnaul. The project with a potential to reduce the goods movement time from 14 days to 14 hours envisages investment of about Rs. 5000 crore. Regarding its implementation a 50:50 joint venture between HSIIDC and DMICDC/DMIC Trust, namely DMIC Haryana Multi Modal Logistic Hub Project Limited is already in place.
 - (iv) **Integrated Aviation Hub, Hisar:** An Integrated Aviation Hub is being developed over 4200 acres of land in Hisar which shall have six Lane Controlled access Highway from Delhi to Hisar and Rapid Rail Connectivity up to Airport. The initiative shall provide great opportunities for logistics sector. The project is envisaged to be developed in phases and NCRPB has already sanctioned financial assistance of Rs. 700 Crore for its first phase. Project broadly involves having International Airport with 9000 ft. airstrip and 3 hangars, fixed base operations (FBO) and MRO Hub, Aviation University & Training Centre and Aerospace Manufacturing.
 - (v) **Fast-track rail corridor:** Haryana Plans to convert existing rail network to fast-track rail corridor between Delhi-Hisar.

3. Economic scenario of Rajasthan State:

- 3.1. Rajasthan's sub-region forms 25% of the total NCR. Rajasthan State as a whole has second largest rail route, 3rd largest in national highways, 7 airports and multi-modal logistics park in Neemrana. It is largest producer of marble / granite, 2nd largest producer of milk, mineral and crude oil. It has highest potential for solar energy and is one of the most preferred tourist destination. As per DIPP, Govt. of India, 2017- Rajasthan among top States in India in 'Ease of Doing Business' Reforms, 2017.
- 3.2. With its skilled manpower and skilling initiatives with 2 dedicated Skill Universities the State is gaining national importance in the sector. There are 83 number of Universities for higher education, 1909 ITIs, 152 Polytechnics and 117 Engineering colleges in the State.
- 3.3. Efforts to promote economic development in the region includes (i) allowing entrepreneurs to start their businesses by filling self-declaration form, (ii) Exemption from inspections from various departments for



first 3 years, (iii) Clearly defined land allotment processes, (iv) All requisite business clearances granted online in defined time, (v) Peaceful labour relations, (vi) Excellent Law & Order situation across the State etc.

3.4. Potential Sectors for Investment in Rajasthan are:

- a) Resource based - Mines & Minerals; Petrochemicals; Food Processing; IT / ITeS
- b) Market based (Rajasthan and north India) - Textile & Apparels; Auto, ESDM; Leather & Footwear; Pharmaceuticals
- c) Geography based – Logistics, Solar and Tourism
- d) Others - Gems and Jewelry, Defence and Chemical

4. Economic scenario of Uttar Pradesh State:

Some of the major initiatives taken by the government to promote Uttar Pradesh as an investment destination are¹:

- 4.1. Uttar Pradesh is the most populous state in India, with a large pool of skilled, semi-skilled and unskilled labour. Alternately, the population is also looked upon as the largest consumer base in the country with around 200 million people. It is the largest producer of food grains among all states in India and accounted for about 17.83 per cent share in the country's total food grain output in 2016-17. Food grain production in the state in 2017-18 stood at 51,252.7 thousand tonnes and 18,416.3 thousand tonnes in 2018-19. Pulses production in the state stood at 2,208.0 thousand tonnes in 2017-18 (4th Advance estimates) and 660.7 thousand tonnes under kharif season in 2018-19 (1st Advance Estimates).
- 4.2. Production of vegetables stood 1002.64 thousand MT in 2018-19. The state has become a hub for the semiconductor industry with several major players having their offices and research and development (R&D) centres in Noida.
- 4.3. Between 2011-12 and 2020-21, Gross State Domestic Product (GSDP) expanded at a Compound Annual Growth Rate (CAGR) of 10.59 per cent to Rs 17.91 trillion (US\$ 256.30 billion).
- 4.4. In 2018, domestic tourist arrivals in the state were 285 million and UP stood second nationally. Foreign tourist arrivals had crossed over 3.78 million and is ranked third nationally.
- 4.5. A 100% subsidiary of Zurich Airport International, Yamuna International Airport Private Limited (YIAPL) has been incorporated to develop Jewar International Airport.
- 4.6. As per state budget 2019-20, amount of Rs 2,000 crore (US\$ 286.16 million) has been allocated for 'Smart City Mission'.
- 4.7. Uttar Pradesh government plans to primarily focus on key sectors such as IT and ITeS, Dairy, Electronics, Tourism, Manufacturing, Renewable Energy, & Agro & Food Processing. The state is in the process of implementing and testing the public-private partnership model in the power sector with an input-based franchisee system. The state offers a wide range of subsidies, policy and fiscal incentives as well as assistance for businesses under the Industrial and Service Sector Investment Policy, 2004 and Infrastructure & Industrial Investment Policy, 2012.
- 4.8. According to the Department for Promotion of Industry and Internal Trade (DPIIT), cumulative FDI inflows¹ in Uttar Pradesh, during April 2000 to September 2019, amounted to US\$ 699 million. In 2019, 147 investment intentions worth Rs 16,799 crore (US\$ 4,404 billion) were filed in Uttar Pradesh.
- 4.9. The state cabinet approved UP Defence and Aerospace Units and Employment Promotion Policy 2018, with an intention to generate 0.25 million jobs and expects an investment of Rs 50,000 crores (US\$ 7.46 billion) over the next five years.
- 4.10. The Uttar Pradesh Information Technology and Start-up Policy, 2016 is aimed at promoting Uttar Pradesh as a preferred and attractive location for investments for various IT/ITeS companies and for establishing IT

¹ <https://www.ibef.org/states/uttar-pradesh-presentation>



Parks as well as IT cities for the development of IT Infrastructure in the state. The state has proposed 40 IT/ITeS parks (apart from IT SEZs), two biotech zones and a knowledge park.

- 4.11. The state has a robust industrial infrastructure, including 15 industrial areas, 12 specialised parks, four growth centres and industrial infrastructure development centres (IIDC). As of February 2020, Uttar Pradesh had 20 notified, 13 operational SEZs and 23 formally, approved SEZs. Merchandise exports from Uttar Pradesh reached US\$ 16.29 billion in 2018-19 and US\$ 12.82 billion in April-December 2019.
- 4.12. In 2019, the state recorded the fastest construction of houses under the Pradhan Mantri Awas Yojna with 14.26 lakh houses constructed from 2016-17 to 2019-20.
- 4.13. Ghaziabad's economic growth is attributed to its many industries, especially the steel sector. More than 500 steel industries in Ghaziabad employed about 25,000 workers. The manufacturing sector makes up 53% of non-agricultural jobs in Ghaziabad. The manufacturing industry is credited with an income that is eight times the income of other industries put together².
- 4.14. UP has some largest industrial authorities like Noida, Greater Noida & Yamina. Apart from bustling industrial activity in cities like Meerut, Ghaziabad, Hapur etc.

² Source: <https://www.eyeonasia.sg/india/know/selected-india-states/ncr-india-profile/#fn:11>



Annexure-D-4.1.1

INDUSTRIAL DEVELOPMENT IN NCR

1. Industrial activities in the NCR have evolved over the last three-four decades. To a great extent, industrial activity in the NCR characterized is by the 'scale factor', wherein developments can be characterized by large and medium units, small-scale industries (SSIs) and development in tiny unorganized units.
2. Industrialization in NCR is concentrated in the sub-regions of Uttar Pradesh (general manufacturing), Haryana (automobile, electronics and Handloom) and Rajasthan (marble, leather and textile). The region accounts for a substantial part of the country's production of cars, motorcycles, and tractors. Industrialization in and around NCR is expected to receive further boost through the proposed creation of Special Economic Zones (SEZs)/industrial zones Make In India.
3. Details of Major industrial clusters: In terms of number of units, electrical machinery, textile products, metal and metal products, food products, repair services and paper and printing units show highest percentage distribution in Delhi. In Haryana Sub-region, units manufacturing engineering goods, consisting of metal products and parts, machine tools and electric machinery show highest percentage distribution. Electric machinery, metal products and parts, chemicals and food products constitute the major sectors in the U.P. Sub-region. In Rajasthan Sub-region, metal products and parts, textile products and transport equipment's along with chemicals, non-metallic mineral products and basic metal products constitute the major sectors.

Table D-4.1.1.1: Major Industrial clusters in NCR

Location	Product	No of units	Employment (Direct)	Turnover (Crores)
Meerut	Auto components	4700	26000	100
	Band Instruments	433	8500	20
	Glass & Wooden beads	3000	15000	0.7
	Mini Gas Cylinders	160	7500	100
	Power loom/ Embroidery	3000	30000	40
	Rubber Products	130	2500	40
	Scissors	225	5000	25
	Sport goods	3500	70000	200
	Transformers and voltage regulators	100	3500	400
Ghaziabad	Chemicals	224	1574	135.54
	Engineering Equipments	635	7400	340
	Pilkhuwa Textile Printing	400	20000	100
	Plastic Packaging	150	10000	350
Bulandshahr	Pottery Cluster Khurja	80	2500	450
	Khurja Ceramics	600	50000	200
NOIDA	Chemicals	111	2221	109.49
	Auto and engineering item	12000	200000	50000
	Garments	6014	94736	3200
	Packaging Material	124	1800	84.15
	Plastic Products	350	6500	250



Location	Product	No of units	Employment (Direct)	Turnover (Crores)
Alwar	Auto Components	200	19500	250
Delhi	Auto Components	1500	50000	297.2
	Chemicals	339	3562	337.02
	Engineering Equipments	2691	47000	2,000.00
	Food Products	432	1939	594.28
	Textiles including garment	1901	132000	921.32
	Cosmetic & Packaging	240	7200	100
	Plastic Products	746	16478	54.22
	Rubber Products	178	18684	192.64
	Sanitary Fittings	100	900	30
	Printing & Packaging, Naraina	450	5000	400
Gurgaon	Automobile and engineering	5000	260000	10000
	Rubber & Chemicals	472	11619	907
	Electronic and Electricals	107	3427	702
	Readymade Garments	1310	87380	13000
	Leather and Leather and Fur Products, Manesar	205	35000	867
Panipat	Handloom	1800	23000	
	Powerloom	720	50000	600
	Cotton Spinning and Shoddy Yarn	500	50000	500
	Carpet	400	60000	150
	Home Furnishing Cluster	85	2800	465
	Textile machinery	28	477	32.4
	Samalkha Foundry Cluster	30	1200	95
Faridabad	Auto components and engineering	2500	10000	3250
	Chemicals	275	1375	825
	Electrical Engineering Equipments	203	5000	1500
	Textiles	320	7000	3,200.00
Jhajjar	General Engineering	134	1000	70
	Footwear	125	12400	1560
Sonipat	Stainless Steel Cluster- Kundli	72	8000	800
	Chemicals	120	2500	100
	General Engineering	150	3000	100
	Printing & Packaging Cluster, Rai	110	4400	165

Source: Cluster observatory, MSME Foundation

Distributive trade is one of the basic activities in Delhi and this factor has been instrumental in large scale employment generation in both formal and informal sectors. In addition, the functional specialization of Delhi, being the centre of political and administrative power, has also resulted in the concentration of banking activities, godowns, transport and communication facilities etc. In the rest of NCR, commercial activities are fairly developed in bigger towns like Meerut, Ghaziabad, Hapur, Khurja and Bulandshahr in U.P. Sub-region, Faridabad, Panipat, Rewari, Gurgaon, Sonapat and Rohtak in Haryana Sub-region and Alwar in Rajasthan Sub-region, respectively.

4. Details of Industrial Parks in NCR

Department for promotion of Industry & Internal Trade has developed Industrial Information System (IIS) portal, a GIS-enabled database of industrial areas/clusters across the country to adopt a committed approach towards resource optimization, industrial up gradation and sustainability. There are about 142 industrial



parks in the NCR (registered on IIS portal of DPIIT) as detailed in the following table:

Table D-4.1.1.2: District wise distribution of Industrial Parks in NCR with sector

Sub Region/ District	Number of Industrial Parks	Sector
*NCT Delhi	30	Mixed
Haryana Sub Region		
Faridabad	3	Engineering
Gurgaon	21	Electronics Hardware, Engineering, Mixed, Software, Automobiles etc.
Jind	2	Engineering
Jhajjar	2	Automobiles, Electronics Hardware, Engineering, Food Processing, Machine Tools, Textile
Karnal	2	Engineering
Mahendragarh	1	Engineering
Panipat	4	Chemicals, Textile, Electronics Hardware, Software
Rohtak	3	Automobiles, Engineering, Mixed, Food Processing
Rewari	2	Automobiles
Sonipat	8	Automobiles, Chemicals, Mixed, Food Processing, Engineering
Uttar Pradesh Sub Region		
Bulandshahr	3	Mixed
Ghaziabad	8	Mixed
G B Nagar	16	Electronics Hardware, Engineering, Mixed, Pharmaceuticals, Software
Meerut	2	Mixed
Muzaffarnagar	2	Mixed
Shamli	2	Mixed
Rajasthan Sub Region		
Alwar	26	Mixed, Electronics Hardware, Engineering
Bharatpur	5	Mixed
Total	142	

Source: <https://iis.ncog.gov.in/parks/admin/mainDashboardIPRSUrl>

*Delhi <https://pib.gov.in/PressReleasePage.aspx?PRID=1602006>

- i) In terms of number of units, electrical machinery, textile products, metal and metal products, food products, repair services and paper and printing units show highest percentage distribution in Delhi. In Haryana Sub-region, units manufacturing engineering goods, consisting of metal products and parts, machine tools and electric machinery show highest percentage distribution. Electric machinery, metal products and parts, chemicals and food products constitute the major sectors in the U.P. Sub-region. In Rajasthan Sub-region, metal products and parts, textile products and transport equipment's along with chemicals, non-metallic mineral products and basic metal products constitute the major sectors.
 - ii). Distributive trade is one of the basic activities in Delhi and this factor has been instrumental in large scale employment generation in both formal and informal sectors. In addition, the functional specialization of Delhi, being the centre of political and administrative power, has also resulted in the concentration of banking activities, godowns, transport and communication facilities etc. In the rest of NCR, commercial activities are fairly developed in bigger towns like Meerut, Ghaziabad, Hapur, Khurja and Bulandshahr in U.P. Sub-region, Faridabad, Panipat, Rewari, Gurgaon, Sonapat and Rohtak in Haryana Sub-region and Alwar in Rajasthan Sub-region, respectively.
5. There are about 100 industrial clusters in NCR. Most of the clusters are located in Meerut, Ghaziabad, Gautambudha Nagar, Bulandshahr, Delhi, Gurgaon, Faridabad, and Panipat and Alwar districts of NCR which are mainly related to auto component, textiles, general engineering, power looms, carpet, etc.



- 5.1 **Automotive industry in NCR** - NCR has emerged as a modern hub of automotive industry. It produces over 30% of the cars and 50% of two-wheelers in India³. Development of automotive and other heavy industries through well planned and integrated Industrial Estates are foreseen to boost economic growth in NCR and to generate ample employment opportunities. Country's largest car manufacturer Maruti Suzuki India chose Gurugram and Honda set up a car plant in Greater Noida. Also Hero MotoCorp has set its two-wheeler plants in Gurugram and Manesar, Honda has a two-wheeler plant in Tapukhera (Alwar) and Yamaha a two wheeler plant in Greater Noida. Main attraction for auto manufacturers is availability of manpower – both skilled and shop floor workers has been easily available since the region has large number of engineering colleges with Uttar Pradesh taking the lead. The automotive industry has strong multiplier effect, hence, growth for automotive industry is important for economic growth. Govt. of India aims to make automobile manufacturing the main drive of 'Make in India' initiative, as it expects passenger vehicles market to triple to 9.4 million units by 2026 (Automotive Mission Plan (AMP) 2016-26).

Box D-4.1.1.1 Vision for Automotive Mission Plan 2016-26

- By 2026, Indian automotive industry will be among top three of the world in engineering, manufacture & export of vehicles and components, and will encompass safe, efficient and environment friendly conditions for affordable mobility of people and transportation of goods in India comparable with global standards, growing in value to over 12% of India's GDP, and generating an additional 65 million jobs"
- Automotive Mission Plan 2026 envisages a 3 – 3.5x growth in volumes over its tenure.

- 5.2 **IT industry** has the potential to improve the productivity as well as other dimensions of economic and social development in the region and hence, strengthening of this sector in NCR is one of the focus areas.

- 5.3 NCR not only caters to the intrinsic warehousing demand but also acts as a key storage and warehousing hub for the neighboring states and other distant regions in the North. National Logistics Policy and Multi-Modal Logistics Parks (MMLPs) are the key policy initiatives of Government of India for boosting 'Make in India' program and to improve country's logistics sector. This initiative will lower freight costs, reduce vehicular pollution and congestion and cut warehouse costs to promote domestic and global trade. Development of well planned, integrated and interconnected Logistics corridors and MMLPs across NCR will be a milestone to accelerate economic growth of region. Broad policy framework is given as bellow:

A. Key Announcements regarding the National Logistics Policy Geo-tagging of all warehousing⁴.

- 1) Warehousing be promoted to comply with Warehousing Development & Regulatory Authority norms.
- 2) Viability Gap Funding (VGF) be provided for setting up of warehousing at block / taluk levels on PPP mode. Food Corporation of India, Central Warehousing Corporation shall also offer their land for this purpose.
- 3) Village Storage Scheme through Women Self-help groups shall provide backward linkages for seeds thereby reducing logistics costs. Financial assistance be provided under MUDRA loans and NABARD.
- 4) Refrigerated vans shall be attached to passenger trains to promote quick movement of perishables. Cold chains for fish and perishables shall be promoted.
- 5) Krishi trains shall also be run on PPP mode.
- 6) Krishi Udan scheme shall be promoted / launched whereby horticulture and perishable commodities shall be transported through air-route that will especially benefit the North-East region and tribal area.
- 7) Cluster approach shall be adopted for promoting horticulture. One Product One District shall be encouraged. National Organic e-Market will be developed for organic products.

³Society of Indian Automobile Manufacturers (SIAM)

⁴Source: https://commerce.gov.in/writereaddata/UploadedFile/MOC_636850457336854610_Notification-Draft-05022019.pdf



- 8) Financing of negotiable warehousing receipts & its integration with e-NAM would be encouraged.
- 9) Rs.100 lakh crore National Infrastructure pipeline has been launched which includes over 6500 infrastructure projects and has projects worth Rs.19.6 lakh crore for roads, Rs.13.69 lakh crore for railways, Rs.1.43 lakh crore for airports and Rs.1.01 lakh crore for ports.
- 10) Accelerated development of highways will be undertaken. 2500 kms. of access controlled highways, 9000 kms. of economic corridors, 2000 kms. of coastal and land-port roads and 2000 kms. of strategic highways.
- 11) Delhi – Mumbai and Chennai – Bengaluru express highways to be made operational by 2023.
- 12) 12 lots of highway building consisting of over 6000 kms. shall be offered for monetisation by 2024.
- 13) Governance structure for corporatisation of one major port shall be introduced.
- 14) Inland Waterways especially Jal Vikas Marg (NW1) will be made operational. Inland Waterways shall be promoted under the Programme called Arth-Ganga i.e., promoting economic activities along with river banks.
- 15) 100 more airports be established under the UDAN scheme. 1200 airplanes shall be added from the present 600.

B. NCR Warehousing and Logistics Scenario:

- i) **Uttar Pradesh Warehousing and Logistics Policy 2018⁵**- Uttar Pradesh Warehousing and Logistics Policy 2018 aim at complementing the UP Industrial Investment & Employment Promotion Policy (UP IIEP) 2017, and strengthen the state's foothold in the logistics sector. Its basic objective is to promote private investments in setting up logistics facilities in the state with forward and backward linkages. Govt of UP is already promoting projects such as Integrated Industrial Township at Greater Noida, Multi-Modal Logistics hub at Dadri and Multi-Modal Transport Hub at Boraki.
- ii) **Haryana Logistics, Warehousing & Retail Policy, 2019⁶**- Government of Haryana has notified, Haryana Logistics, Warehousing & Retail Policy, 2019 with an objective to create at least five Logistics Parks across Haryana with private sector participation (by 2023) and generate employment to the tune of 25,000 new jobs⁷.
- iii) **Rajasthan Industrial Development Policy, 2019⁸**- The Rajasthan Industrial Development Policy, 2019 states that assistance shall be provided for developing Multimode Logistics Hubs, Logistics Parks, Cold Chains and Inland Container Depot shall be provided to strengthen the logistics infrastructure.

C. Major warehousing clusters in NCR⁹:

- i) According to a Knight Frank “India Warehousing Market Report-2018”, Logistics cost in India accounts for 13-14% of the Gross Domestic Product (GDP) which is nearly double (6-9%) the logistics cost to GDP ratio in developed countries such as the US, Hong Kong and France.
- ii) NCR being amongst largest consumer of manufacturing good and retail market, historically, warehousing activities in NCR have been concentrated in the peripheral areas of Delhi, such as Alipur, GT Road, Kapashera, Bamnoli, Dhulsiras and Okhla, with godown-type structures dominating the landscape. As land prices became unfeasible for such activities, they slowly started shifting outside the Delhi border. In the southern region, markets such as Kherki Daula and

⁵Source: https://niveshmitra.up.nic.in/Documents/DraftPolicies/UPWarehousingandLogisticsPolicy_2018.pdf

⁶<http://www.egazetteharyana.gov.in/Gazette/Extra-Ordinary/2019/88-2019-Ext/8310.pdf>

⁷Source: <https://investharyana.in/content/pdfs/Notified%20LWR%20policy.pdf>

⁸Source: <http://www.industries.rajasthan.gov.in/content/dam/industries/pdf/riico/policies/Rajasthan%20Industrial%20Policy/Rajasthan%20Industrial%20Development%20Policy%202019.pdf>

⁹Source: Source: Knight Frank Research – NCR WAREHOUSING MARKET REPORT, 2018



Manesar on NH-48 started attracting warehousing activities, while Kundli and Sonipat on NH-44 in the northern region developed as alternative markets. Similarly, NH-34, NE3 and NH-34 near Ghaziabad became attractive for warehousing activities as land prices on GT Road became unviable. Over the last decade, with residential & commercial development mushrooming on NH-48, warehousing activities have gradually shifted towards locations on Haryana's internal roads. These locations are just off the main NH but well connected to it. Locations such as the Gurgaon-Pataudi road, Jamalpur-Panchgaon road, Bilaspur-Tauru road and Barota have witnessed a phenomenal growth in terms of warehousing space over the last decade. Similarly, Dharuhera on NH-48 and Palwal on NH-44 have observed massive warehousing development in recent years.

- iii) Various warehousing markets are classified into two major clusters: NH-48 cluster and Ghaziabad cluster, based on factors such as geographical location, proximity to the national highway, and access to the Delhi city centre and distance from the major manufacturing hubs. These two clusters collectively account for the majority of the warehousing space demand in the NCR market.
- iv) With the development of major NHs in south west NCR and Peripheral Expressway or Kundli Ghaziabad-Palwal (KGP) Expressway and the Western Peripheral Expressway in NCR, logistics and warehousing facilities have started developing in areas like Palwal, Sohna, Faridabad, Noida-Greater Noida, Alipur, Kundli, Sonipat, Murthal, Barota and Mundka and along these corridors due to the presence of better and cheaper road and rail infrastructure.
- v) Currently, NCR's total requirement for warehousing space is estimated to be 223 mn sq ft, of which more than 80%, or 187 mn sq ft, is from the manufacturing sector. However, the majority of the warehousing requirement of manufacturing sector is fulfilled by captive space, either in terms of space at manufacturer's plant or company owned warehouses. Such leasable market in NCR is currently estimated to be in range of 100-120 mn sq ft. However, the share of annual transacted volume is approximately 7mn sq ft.

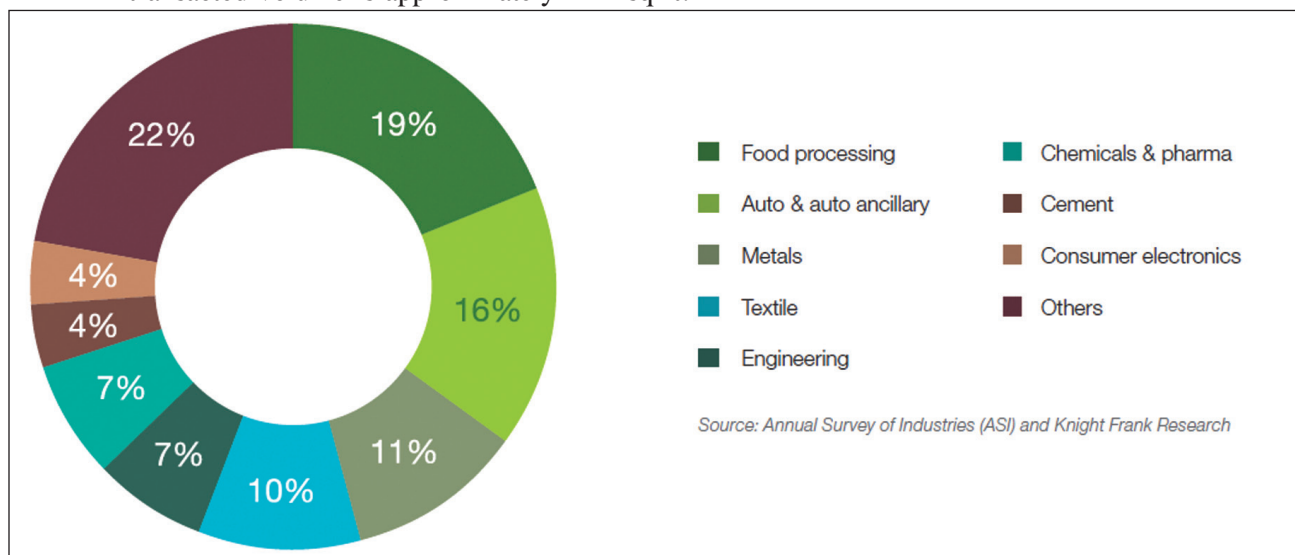


Figure D-4.1.1.1: Share in output of the various manufacturing industries in NCR

- vi) E-Retail sector has emerged as a major driver for the incremental warehousing space requirement in recent years and currently accounts for 14% of total space requirement of consumption led demand. While brick-and-mortar stores still lead in terms of space requirement, at 31 mn. sq ft, the E-tail segment contributes upto 5 mn sq ft. However, current estimated space requirement from the E-tail segment to increase by 60%, to more than 8 mn sq ft in 2020.
- vii) Demand for warehousing in NCR is on an upward swing with a year to year 94% increase in the total transacted space in 2018.



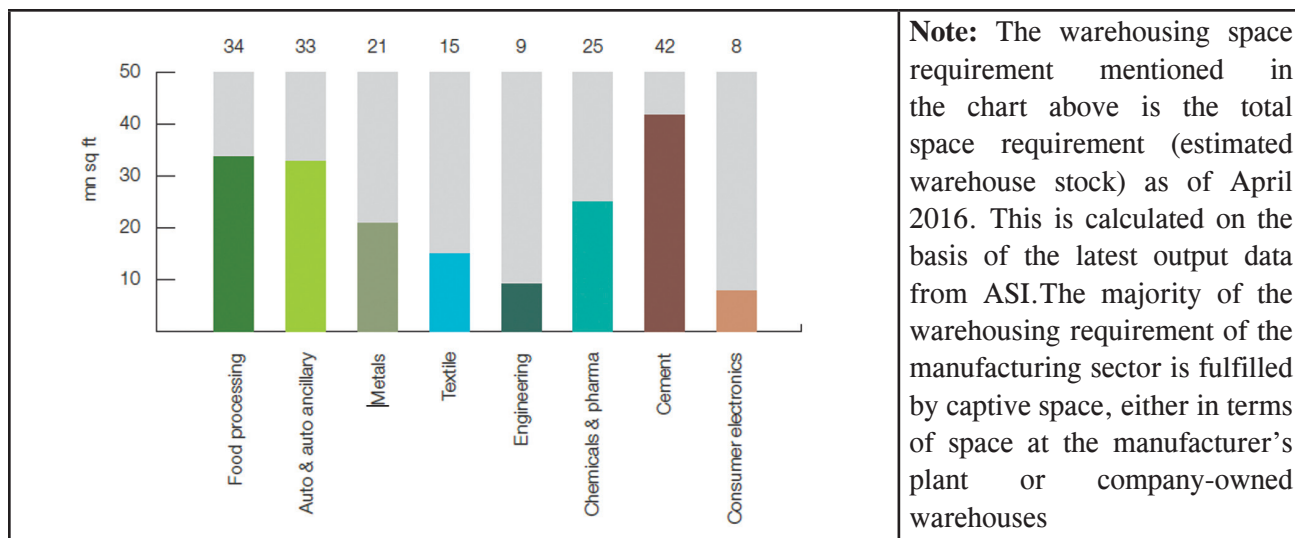


Figure D-4.1.1.2: Warehousing space requirements of major manufacturing industries in NCR

Source: Knight Frank Research – NCR WAREHOUSING MARKET REPORT, 2018

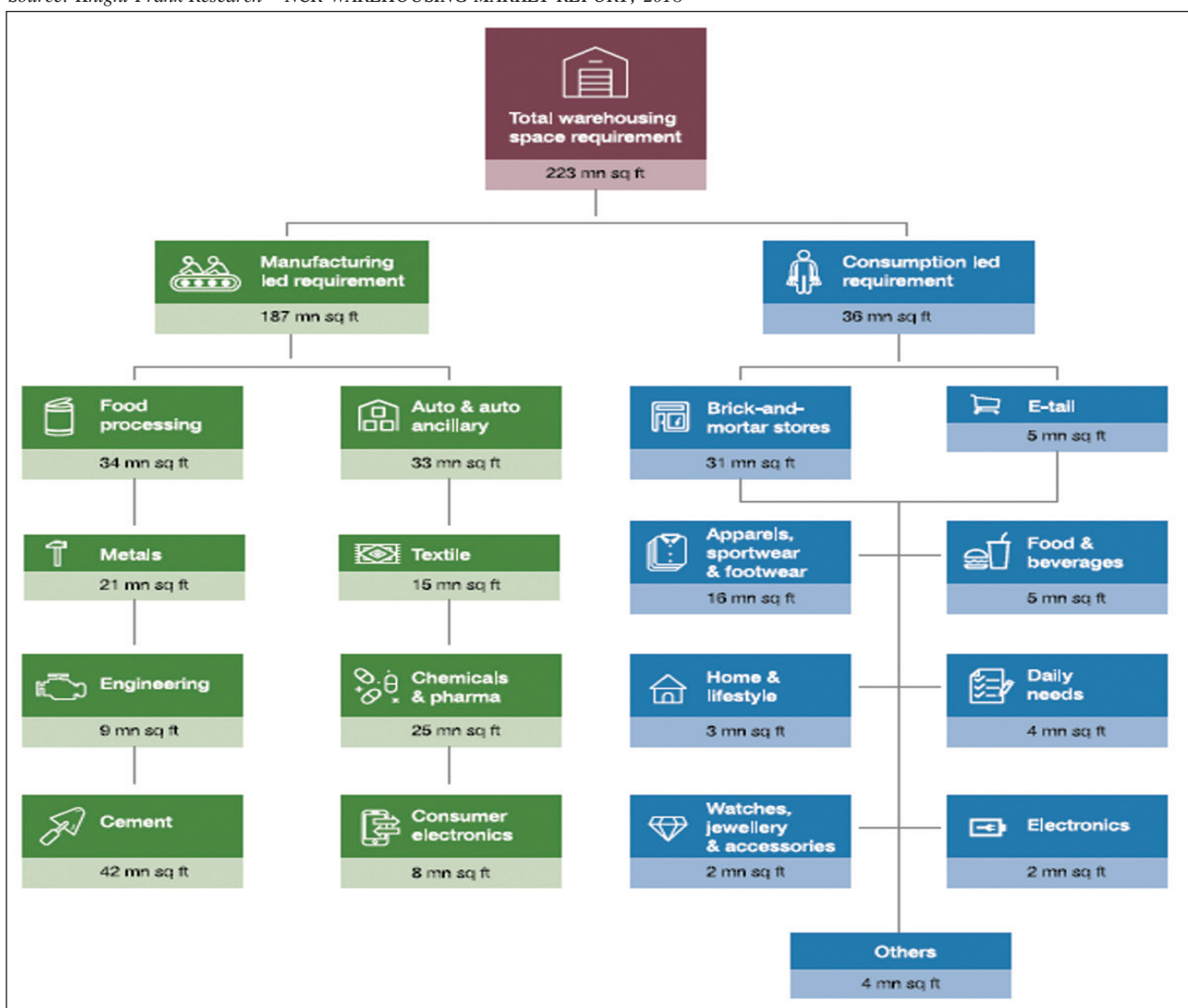


Figure D-4.1.1.3: Total requirement for warehousing space in NCR, 2018

Source: Knight Frank Research, 2018- NCR WAREHOUSING MARKET REPORT

- 5.4 India is the world's second largest producer of fruits & vegetables after China but hardly 25% of the produce is processed¹⁰. Food Processing Industry (FPI) has enormous significance as it provides vital linkages and synergies between the two major pillars of the economy i.e. agriculture and industry. **Agro & Food Processing Industries** has a vital potential & role for NCR's economy and growth. Total production of various types of fruits, vegetables and spices in NCR in year 2015-16 was around 6690 thousand MT. The organised milk market in the region, estimated at five million litres per day, is growing at 6-8 per cent annually¹¹.

Table D-4.1.1.3: District wise Fruits and Vegetables Produced in NCR

Sl.No.	Sub-Region	Districts	Major Fruit	Major Vegetable
1	U.P.	Meerut, Hapur, Baghpat, Ghaziabad, Gautam Budh Nagar and Bulandshahr	Mango, Guava, Peach, Litchi	Cauliflower, Okra, Turnip, Cabbage, Brinjal, & Potato
2	Haryana	Sonapat and Mewat	Guava, Mango, Watermelon, Muskmelon	Potato, Cauliflower, Tomato, Onion, Radish, Leafy Vegetables, Cabbage, Brinjal, Carrot, Bottle Gourd
3	Rajasthan	Alwar	Nil	Onion, Carrot

Source: Ministry of Food Processing Industries, Government of India¹²

- 5.5 As per Functional Plan for **Micro and Household Enterprises** in NCR, there are more than 42 lakh MSMEs in the region. Among these MSMEs about 86,000 are micro & small scale enterprises, employing over 9-10 lakh people. MSMEs including Khadi & Village Industries, handicrafts, Pottery, Sports Goods & other small & medium size enterprises has a vast economic potential in NCR which is proposed be harnessed in accordance with the prevalent MSME Act, policies and schemes of the Govt. of India and various NCR participating States initiatives.

- 5.6 **Electronics System Design and Manufacturing (ESDM) sector:** The ailing electronics hardware industry of India got a strong boost with the setting up of an Electronics Manufacturing Cluster (EMC) in Bhiwadi & Neemrana, Rajasthan. Launched under the Electronics Manufacturing Cluster Scheme 2012 and backed by Electronic Industries Association of India (ELCINA), the Bhiwadi EMC is a Greenfield project spread across 100 acres. As of now, 19 domestic component makers have invested in the cluster, having committed over US\$ 150 for Phase I. The overall investment in this EMC is 2.19 billion, and it has the capacity to accommodate almost 50 companies. ESDM sector in NCR is expected to grow tremendously, as UP government plans to promote Noida, Greater Noida and Yamuna Expressway area as an Electronics Manufacturing Zone (EMZ)¹³. More such cluster are notified/ planned by the Ministry of Electronics & Information Technology (MeitY), Govt. of India¹⁴ in Integrated Industrial Township at Greater Noida & Ghaziabad in U.P. sub-region and in Sonapat, Jhajjar, Palwal, Faridabad, Gurugram, Bawal and Dharuhera areas of Harayna sub-region in NCR considering the requirements of the sector.

- i) **Electronic Manufacturing Clusters (EMC) Scheme¹⁵** - To make India a global player in field of Electronics Manufacturing and to offset disabilities faced by industries for reliable infrastructure, EMC scheme was notified vide notification no. 252 dated 22nd October, 2012 to provide support for creation of world-class infrastructure for attracting investments in the ESDM Sector. For effective functioning of the scheme, a set of guidelines for operationalization of the EMC scheme were issued on 15th April 2013. Guidelines for EMC contains the requisite project parameters, detailed terms and conditions of the scheme along with the applications forms for making preliminary and final application. The EMCs scheme provides grant assistance for setting up of both Greenfield and Brownfield EMCs across the country. The financial assistance under the scheme is in the form of grant-in-aid only.

¹⁰Source: <https://www.drishtias.com/to-the-points/paper3/food-processing-in-india>

¹¹Source: <https://www.ibef.org/states/delhi.aspx>

¹²Source: <http://mofpi.nic.in/Schemes/agro-processing-cluster>

¹³Source: <https://www.electronicseb2b.com/headlines/delhi-ncr-generating-growth-opportunities-diverse-segments-economy/>

¹⁴Source: <https://meity.gov.in/content/archive-list-notified-electronics-manufacturing-clusters-purpose-m-sips>

¹⁵Source: <https://meity.gov.in/esdm/clusters>



- ii) The application form for making application for Greenfield EMCs and Brownfield EMCs are provided on the website of Ministry of Electronics & Information Technology, Government of India. An application can be made by an SPV created for the purpose or by a Chief promoter who may be a public sector or private sector entity. All the applications received under the EMC scheme are considered by Steering Committee for Cluster (SCC) for giving its recommendations to the Government for accord of in- principle / Final approval. Detailed Scheme and Guidelines can be seen on MeitY website.

- 5.7 **Airports:** The Indira Gandhi International (IGI) airport is India's largest and the world's 16th most busy airport as per the Airports Council International (ACI). As per techno-economic feasibility report (TEFR) by PwC (Price Waterhouse Cooper) the IGI and upcoming second international airport in Jewar (to be operational by 2022) will cater to over 300 million passengers annually, by 2050. As per the report the IGI airport currently serves over 60 million passengers annually. The Jewar international airport, which will be completed in four phases, over an area of 5,000 hectares in Uttar Pradesh sub-region, will have four runways. Airport at Jewar may serve a total annual passenger demand of around 5 million which may go up to 16 million by 2029-30, 71 million by 2043-44 and continue to operate at around 77million till end of the concession. Overall cargo demand at the proposed airport is expected to be around 0.4 million metric tons in 2022-23 and reach up to 2.9 million metric tons by 2049-50¹⁶.
- 5.8 **Attractive Startup Zone and Incubator facilities:** During 2017, Delhi-NCR was ranked second, after Bengaluru, as the technology hub of India. As on April, 2020, there were about 20,887 Startups (about 10,927 tech startups¹⁷) in NCR, including startups in the financial and consumer services fields. Delhi-NCR also hosts the highest number of online retail startups – a total of 1,288. Major online startups like Ibibo, Lenskart, Paytm, Snapdeal, Shopclues and Policy Bazaar are based in NCR. As per India Angel¹⁸ Report 2017 NCR continues to attract the largest share of investment whereas Bengaluru share declined. During 2017, Delhi NCR received up to 33 percent of angel investments, whereas Mumbai, Chennai and Bengaluru received only 14 percent, 12 percent and 10 percent, respectively. One of the crucial reasons for startups choosing Delhi-NCR above Bengaluru or any other metro is the presence of the strong network of business incubators in the region, which fuel their growth, giving them the thrust they need to take that giant leap into the entrepreneurial world.
- 5.8.1 Sub-region & city wise no. of startups recognized and non-recognized with DPIIT, along with district wise and sector wise analysis are given in the Tables D-4.1.1.4, D-4.1.1.5 and D-4.1.1.6 respectively.

Table D-4.1.1.4: City wise No. of Startups in NCR

State	City	No. of Startups	DPIIT Recognized Startups
Rajasthan	Alwar	110	33
	Bharatpur	24	24
Uttar Pradesh	Ghaziabad	1124	352
	Noida	2341	935
	Meerut	286	60
Haryana	Gurgaon	2312	1125
	Faridabad	863	310
	Panipat	125	43
	Sonipat	119	38
	Rohtak	92	27
Delhi	Delhi	7567	2717
	New Delhi	5924	2268
NCR	Total	20887	7932

Source: Startupindia portal¹⁹

Note: DPIIT recognized startups receive Intellectual Property Rights (IPR) benefits, relaxation in public procurements norms, self-certification under Labour & Environment law etc.

¹⁶Source: <http://environmentclearance.nic.in/writereaddata/online/EC/170620191KAW3B3CPFR.pdf>

¹⁷Source: <https://tracxn.com/explore/Startups-in-Delhi-NCR/>

¹⁸Source: <https://www.innovencapital.com/wp-content/uploads/2018/11/Innoven-Capital-India-Angel-Report-2017.pdf>

¹⁹Source: <https://www.startupindia.gov.in/content/sih/en/search.html?roles=Startup&page=0>



Table D-4.1.1.5: NCR District wise analysis of recognized Startups²⁰

State	District	Total Startups Recognized	2016	2017	2018	2019	2020	Startups with atleast one female director	Percentage of Startups with atleast one female director
Delhi	South Delhi	1004	30	181	257	304	232	444	44%
	South West Delhi	748	12	158	196	185	197	357	48%
	East Delhi	659	9	100	193	192	165	309	47%
	North West Delhi	564	11	100	129	175	149	233	41%
	West Delhi	528	5	98	146	143	136	231	44%
	South Eastdelhi	340	0	0	64	169	107	157	46%
	Central Delhi	281	5	55	60	96	65	113	40%
	New Delhi	177	2	17	41	52	65	80	45%
	North Delhi	170	0	21	53	43	53	78	46%
	North East Delhi	92	0	8	22	38	24	41	45%
	Shahdara	63	0	4	23	21	15	30	48%
	Not Provided	4	0	0	0	2	2	1	25%
Rajasthan	Alwar	48	1	10	13	8	16	20	42%
	Bharatpur	10	0	1	1	2	6	3	30%
Uttar Pradesh	Gautam Buddha Nagar	1078	8	135	261	356	318	544	50%
	Ghaziabad	465	7	70	118	135	135	247	53%
	Meerut	76	1	11	19	27	18	40	53%
	Muzaffarnagar	14	0	3	5	4	2	5	36%
	BULANDSHAHR	13	0	1	6	0	6	7	54%
	Hapur	9	0	1	1	3	4	4	44%
	Baghpat	4	0	2	0	1	1	2	50%
	Shamli	3	0	0	0	0	3	1	33%
Haryana	Gurugram	1360	17	190	312	502	339	629	46%
	Faridabad	231	7	20	57	76	71	124	54%
	Panipat	53	0	4	6	24	19	16	30%
	Sonipat	50	0	3	11	15	21	19	38%
	Karnal	48	1	6	5	21	15	20	42%
	Rohtak	41	0	6	14	7	14	20	49%
	Jhajjar	25	0	0	12	6	7	10	40%
	Rewari	13	0	0	5	5	3	6	46%
	Bhiwani	12	0	0	7	1	4	5	42%
	Jind	9	0	2	3	2	2	2	22%
	Mahendragarh	6	0	0	2	3	1	4	67%
	Charki Dadri	4	0	0	3	1	0	3	75%
	Palwal	4	0	0	0	3	1	2	50%
	Nuh (Mewat)	0	0	0	0	0	0	0	0%
NCR Total		8206	116	1207	2045	2622	2216	3807	--

²⁰Data as of 6th September 2020

Table D-4.1.1.6: NCR Sector wise analysis of recognized Startups²¹

State	District		Top Sectors	
Delhi	South Delhi	Healthcare & Lifesciences	IT Services	Education
	South West Delhi	IT Services	Education	Healthcare & Lifesciences
	East Delhi	IT Services	Professional & Commercial Services	Healthcare & Lifesciences
	North West Delhi	Healthcare & Lifesciences	IT Services	Education
	West Delhi	IT Services	Education	Healthcare & Lifesciences
	South East Delhi	IT Services	Education	Healthcare & Lifesciences
	Central Delhi	IT Services	Education	Healthcare & Lifesciences
	New Delhi	IT Services	Professional & Commercial Services	Healthcare & Lifesciences
	North Delhi	Healthcare & Lifesciences	IT Services	Construction
	North East Delhi	Professional & Commercial Services	IT Services	Education
	Shahdara	Education	Healthcare & Lifesciences	Retail
Rajasthan	Alwar	Agriculture	Education	Healthcare & Lifesciences
	Bharatpur	Agriculture	Education	Healthcare & Lifesciences
Uttar Pradesh	GB Nagar	IT Services	Education	Professional & Commercial Services
	Ghaziabad	IT Services	Education	Healthcare & Lifesciences
	Meerut	IT Services	Education	Healthcare & Lifesciences
	Muzaffarnagar	IT Services	Enterprise Software	
	Bulandshahr	IT Services	Construction	Marketing
	Hapur	Healthcare & Lifesciences		
	Baghpat	Agriculture	Automotive	Finance Technology
	Shamli	Education	Enterprise Software	Fashion
Haryana	Gurugram	IT Services	Healthcare & Lifesciences	Education
	Faridabad	IT Services	Healthcare & Lifesciences	Education
	Panipat	Construction	Non- Renewable Energy	
	Sonapat	Technology Hardware	Healthcare & Lifesciences	
	Karnal	Construction	Healthcare & Lifesciences	
	Rohtak	Education	Healthcare & Lifesciences	IT Services
	Jhajjar	IT Services	Construction	Healthcare & Lifesciences
	Rewari	Education	Green Technology	Healthcare & Lifesciences
	Bhiwani	Construction	Education	Healthcare & Lifesciences
	Jind	Education	Professional & Commercial Services	
	Mahendragarh	Marketing	IT Services	
	Charki Dadri	Chemicals	Construction	Education
	Palwal	Education	IT Services	Professional & Commercial Services

5.8.2 Incubator facilities in NCR²²

From providing mentorship to entrepreneurs and sharing office space, to enabling networking opportunities and access to investors, a business incubator offers every type of assistance that a startup may require in the early stages. There are about 575 incubators in India; of which 83 incubators are in NCR as per Table D-4.1.1.7.

²¹Data as of 6th September 2020

²² Source: <https://www.electronicshb2b.com/headlines/delhi-ncr-generating-growth-opportunities-diverse-segments-economy/>



Table D-4.1.1.7: Incubators in NCR Districts

State	District	Incubator Name
Delhi	N/A	ANDC inStart Foundation
		Clean Energy International Incubation Center
		DUCIC MSME Technology Business Incubator, Cluster Innovatio Centre, DU
		DPSRU Innovation & Incubator Foundation (DIIF), Delhi Pharmaceutical Sciences and Research University
		DTU Innovation And Incubation Foundation (DTU IIF), Delhi Technological University (DTU)
		Foundation for Innovation and Technology Transfer(FITT), IIT Delhi
		IAN mentoring & incubation services
		IGDTUW Anveshan Foundation
		IIITD Innovation & Incubation Center
		Incubation Research Foundation
		Pusa Krishi Incubator, Indian Agricultural Research Institute, New Delhi
		Indigram Labs Foundation
		National Centre for Integrated Pest Management, New Delhi
		North Eastern India-ASEAN Chamber of Commerce & Industry
		NSUT IIF, Netaji Subhas University of Technology
		Shriram Institute – Technology Business Incubator (SRI-TBI), Shriram Institute for Industrial Research
		Springboard Solutions Pvt. Ltd. (This is 91 Springboard at multiple locations)
		SSCBS Innovation and Incubation Foundation (SIIF), SSCBS, DU
		Technology based Incubator Society (TBIS)
		ZTM-BPD, IARI
Rajasthan	Alwar	Alwar Institute of Engineering Technology
	Bharatpur	Directorate of Rapeseed Mustard Research, Bharatpur, Rajasthan
	Bharatpur	Incubation Center at Government Engineering College, Bharatpur
Uttar Pradesh	Ghaziabad	Hi Tech Institute of Engg. & Technology
	Ghaziabad	TBI - KIET Group of Institutions
	Meerut	IIMT College Of Medical Sciences Meerut
	Meerut	Shobhit University
Haryana	Faridabad	J C Bose University of Science and technology, YMCA, Faridabad
	Faridabad	BSC BioNEST Bio-Incubator
	Rohtak	Pandit Lakshmi Chand State Performing University, University of Visual Arts, Rohtak
	Gurugram	AIC-Sangam Innovation Foundation
	Gurugram	Centre of Excellence for Internet of Things (CoE – IoT)
	Gurugram	GoH-IAMAI Mobile10X Hub
	Gurugram	NASSCOM 10,000 Startups
	Gurugram	NASSCOM CoE IoT
	Gurugram	IAMAI Mobile10X

Table D-4.1.1.8: City wise No. of Incubators in NCR

Sub-region	City	No. of Incubators
Delhi	Delhi	55
Uttar Pradesh	Ghaziabad	2
	Noida	9
Haryana	Gurgaon	14
	Faridabad	3
Rajasthan	-	-
NCR (Total)		83

Source: Startup India portal²³²³Source: <https://www.startupindia.gov.in/content/sih/en/search.html?roles=Startup&page=0>

BRIEF OF GOVERNMENT INITIATIVES FOR ECONOMIC DEVELOPMENT AND INCOME GENERATION

1. **Deen Dayal Antyodaya Yojana** - National Rural Livelihoods Mission (NRLM)²⁴ and National Urban Livelihoods Mission (NULM)²⁵- enabling rural & urban poor to increase household income through sustainable livelihood enhancements, gainful self-employment and skilled wage employment opportunities and improved access to financial services.
2. **Startup India**²⁶ - a flagship initiative of the Government of India (launched January 2016), intended to build a strong eco-system for nurturing innovation and Startups in the country that will drive sustainable economic growth and generate large scale employment opportunities. The Government through this initiative aims to empower Startups to grow through innovation and design. In order to meet the objectives of the initiative, Government of India announced Startup India Action Plan that addresses all aspects of the Startup ecosystem. With this Action Plan the Government hopes to accelerate spreading of the Startup movement: The Action Plan is divided across the following areas:
 - a) Simplification and Handholding
 - b) Funding Support and Incentives
 - c) Industry-Academia Partnership and Incubation
3. **Modernisation and Strengthening of Intellectual Property Office (MSIPO)**²⁷- the objective of the scheme is to strengthen the capabilities of the Intellectual Property Offices in India; to develop a vibrant Intellectual Property regime in the country; and also to develop modern infrastructure for the Indian Patent Offices to function as an International Search Authority and International Preliminary Examining Authority in order to meet the requirements for international registration of Trade Marks. During last five years focus of the scheme was on infrastructure development, augmentation of human resources, and enhancement in quality of service, computerisation and improvement in IT infrastructure. Training of personnel and outreach activities were the other objectives. The implementing agency in respect of the Scheme has been identified as the office of the Controller General of Patents, Designs and Trademarks (CGPDTM).
4. **Project Based Support to Autonomous Institutions-National Productivity Council (NPC)**²⁸ - a tripartite character, wherein Government, Industry and Labour are equally represented. The main objectives of the Council are to increase awareness of productivity and demonstration of the concepts and techniques of Productivity in all the sectors of the economy. NPC undertakes management and technological consultancy, training and information services in various productivity subjects for the benefit of its clients. The specialized productivity functions dealt by NPC are Process Management, Environment Management, Information Technology and Knowledge Management, Energy Management, Human Resource Management, Agri-business Technology Management etc.
5. **India International Convention & Expo Centre (IICC, Dwarka)** - The Government of India has approved development of India International Convention and Expo Centre (IICC) in Sector-25, Dwarka, New Delhi & allied infrastructure in PPP and non-PPP Mode at an estimated cost of Rs.25,703 crore by the year 2025. Development of Exhibition & Convention space, arena, trunk infrastructure, Metro/NHAI connectivity, hotels, office and retail space etc. are visualised in the project. For development of this project, a Special Purpose Vehicle (SPV) i.e. India International Convention and Exhibition Centre Limited (IICC Ltd), a 100 % owned and controlled Company by Government of India represented through Department for Promotion

²⁴<https://vikaspedia.in/social-welfare/rural-poverty-alleviation-1/schemes/aaajeevika>

²⁵<https://nulm.gov.in/>

²⁶<https://dipp.gov.in/programmes-and-schemes/industrial-promotion/startup-india>

²⁷<https://dipp.gov.in/programmes-and-schemes/intellectual-property-rights/modernisation-and-strengthening-intellectual-property-office-msipo>

²⁸<https://dipp.gov.in/programmes-and-schemes/others/project-based-support-autonomous-institutions-national-productivity-council>



of Industry and Internal Trade (DPIIT) has been incorporated on 19th December, 2017. Development of the project is visualised in two phases. In Phase-1, trunk infrastructure along with Exhibition-cum-Convention Centre is likely to have commenced operations on 13.10.2021. This phase is being implemented as non-PPP component. The remaining Exhibition Area such as hotels, retail and others to be developed by PPP developers in Phase – II and would be completed by 2025²⁹

6. Industrial Corridors-

6.1 Delhi Mumbai Industrial Corridor (DMIC)³⁰- A mix of road, rail, port and airport, the DMIC was launched to change the business landscape, in pursuance of an MOU signed between the Government of India and the Government of Japan in December 2006. DMIC Development Corporation (DMICDC) incorporated in 2008, is the implementing agency for the project. DMICDC has been registered as a company with 49% equity of Government of India, 26% equity of the JBIC and the remaining held by government financial institutions. The Japanese Government had also announced financial support for DMIC project to an extent of US\$ 4.5 billion in the first phase for the projects with Japanese participation involving cutting edge technology.

6.2 Amritsar Kolkata Industrial Corridor (AKIC)³¹- The Government of India is developing Amritsar-Kolkata Industrial Corridor (AKIC) along the alignment of the Eastern Dedicated Freight Corridor (EDFC) traversing a route length of 1839 km in six States. The objective of AKIC would be to optimise the present economic and employment potential of the region, stimulate investments particularly in the manufacturing, agro-processing, services and export oriented units and promote overall economic development of the area through creation of high standard infrastructure and an enabling pro-business environment. The AKIC is proposed to be developed in a band of 150-200 Kms on either side of EDFC, in a phased manner. The AKIC will have an influence area across seven States of Punjab, Haryana, Uttar Pradesh, Uttarakhand, Bihar, Jharkhand and West Bengal.

7. Scheme for implementation of National Manufacturing Policy³² (NMP) - The Scheme covers the components of National Manufacturing Policy. These components are (i) Cost of Master Planning of National Investment & Manufacturing Zones (NIMZ) and (ii) Technology Acquisition and Development Fund (TADF). However, the scheme component TADF has been transferred to M/o Micro, Small and Medium Enterprises (MSME) on 16th September, 2016 and is now being implemented by the Ministry³³.

8. E-commerce can be the driver of overall economic growth over the next decade through its impact on generating demand, expanding manufacturing, employment generation and greater transparency. A Committee, chaired by CEO, NITI Aayog examined issues related to the e-commerce industry and made recommendations for the sector's growth including increasing internet access, digitizing payments, further improving transportation infrastructure, logistics and distributed warehousing support.

9. The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014³⁴. Some of the major provisions are as under:

- a) Street Vendors have been defined to include 'any person engaged in vending of articles, goods, food etc or offering services to the general public in a street lane, sidewalk, footpath, pavement, public park, or any other public or private area. It includes hawkers, peddlers, and squatters.
- b) Any person above 14 years of age, who is a street vendor has to register him/herself with the Town Vending Committee (TVC).
- c) The TVC shall have a 40% representation from street vendors and another 10% from civil society.

²⁹<https://dipp.gov.in/policies-and-schemes/india-international-convention-expo-centre-licc-dwarka>

³⁰<https://dipp.gov.in/japan-plus/delhi-mumbai-industrial-corridor-dmic>

³¹<https://dipp.gov.in/sites/default/files/ic-annex3.pdf>

³²<https://dipp.gov.in/sites/default/files/po-ann3.pdf>

³³<https://dipp.gov.in/programmes-and-schemes/manufacturing-industrial-policy/scheme-implementation-national-manufacturing-policy-nmp>

³⁴<http://legislative.gov.in/sites/default/files/A2014-7.pdf>



- The remaining would be represented by local authorities, residential associations etc.,
- d) Every street vendor has to obtain a certificate of vending from TVC, for which he/she will be issued with an identity card.
 - e) The local authorities shall frame a street vending plan, which shall be revised every 5 years. The plan should contain free vending zones, restricted vending zones, and no-vending zones.
 - f) The local authorities can relocate the street vendors in case of causing a public nuisance. The relocated street vendor shall be provided a new site for vending.
 - g) The local authority is also empowered to confiscate the goods of the vendors in the manner specified in the street vending scheme.
 - h) The duties of the local authority to include monitoring and supervising the street vendor scheme, monitoring the effectiveness of the TVC and deciding appeals.
 - i) There is also a provision to provide credit insurance and welfare schemes to the street vendors by the appropriate government.
 - j) There is a provision for independent Grievance Redressal Mechanism composing a retired judicial officer.

10. Tourism sector: Delhi along with its surrounding cities and neighboring areas one of the key arrival destinations for both foreign and domestic tourists. As per India Tourism Statistics, 2019, in NCT Delhi about 2.9 Cr. domestic and about 27.4 lakh foreign tourists were recorded during 2017 and which were almost same during 2018. In respect of foreign tourist visits in 2018, the top 5 States/UTs were Tamil Nadu (6.1 million), Maharashtra (5.1 million), Uttar Pradesh (3.8 million), Delhi (2.7 million) and Rajasthan (1.8 million), with their respective shares being 21.0%, 17.6%, 13.1%, 9.5% and 6.1% These 5 States/UTs accounted for about 67.3% of the total foreign tourist visits to the States/UTs in the country³⁵. The percentage share of Foreign Tourist Arrivals in India during March 2020 among the top 15 ports was highest at Delhi Airport (27.39%). This shows that tourist's inflow and related activities will enrich Delhi-NCR economy through its multiplier effect. In future multiplier effect of tourism will be of immense importance for NCR economy due to joint presence of Delhi IGI airport and upcoming Jewar airport.

³⁵<http://tourism.gov.in/sites/default/files/Other/India%20Tourism%20Statistics%202019.pdf>



Annexure-D-4.1.3

NATIONAL INFRASTRUCTURE PIPELINE

1. National Infrastructure Pipeline (NIP)

- 1.1 The National Infrastructure Pipeline (NIP) is a group of social and economic infrastructure projects in India over a period of five years to provide world-class infrastructure across the country, and improve the quality of life for all citizens. It aims to improve project preparation, attract investments (both domestic and foreign) into infrastructure, and will be crucial for target of becoming a US \$5 trillion economy by FY 2025.
- 1.2 As per the Final Report on NIP presented on 29th April 2020, projects worth USD1.5 trillion (INR111 trillion) over FY 2020-2025 has been announced for the projects. Out of the total expected capital expenditure of Rs. 111 lakh crore, projects worth Rs 44 lakh crore (40% of NIP) are under implementation, projects worth Rs 33 lakh crore (30%) are at conceptual stage and projects worth Rs 22 lakh crore (20%) are under development. Information regarding project stage are unavailable for projects worth Rs 11 lakh crore (10%). Sectors such as energy (24%), roads (18%), urban (17%) and railways (12%) amount to around 71% of the projected infrastructure investments in India. The Centre (39%) and States (40%) are expected to have almost equal share in implementing the NIP in India, followed by the private sector (21%).
- 1.3 Subsequently, Atma Nirbhar Bharat Abhiyan, KPMG on 13 May 2020 introduced a USD266 billion (INR20 trillion) with the aim of making the country independent against the tough competition in the global supply chain and to help in empowering the poor, labourers, migrants who have been adversely affected by COVID.

2. Mapping NIP sectors with the Infrastructure Vision 2025 themes (illustrative) which could be considered for NCR Area

2.1 Healthcare

Standards in infrastructure; Health UID for all; Upgradation of government medical colleges; E-Learning Management System; Improve bed density; Increase healthcare spend 2.5 per cent of GDP; Achieve objective of Mission Indradhanush: attain full immunisation coverage; Utilisation of teleconsultation: link tertiary care institutions to district and sub-district hospitals; New medical colleges on PPP basis; Develop framework for digital healthcare blueprint across states; Improve medical supply chain logistics for effective emergency response and disaster management

Major projects of NIP identified for Rajasthan and Delhi State of NCR: Construction of new AIIMS, upgradation of government medical colleges, setting up of special education and research blocks at government hospitals.

2.2 Transportation and logistics

Last-mile connectivity – improved access to all remote areas; Reclaiming streets for pedestrians; 100 per cent of the existing railway network electrified; Increased use of FASTag and tolling based on 'pay per use' concept; Online ticketing; Building resilience against risks; Measurable reduction in infrastructure losses from disasters; Higher penetration of technology (automated traffic controllers, speed regulators, digital message boards); Expand regional air connectivity to all Tier-2 and Tier-3 cities; Commercial operations of Jewar Airport

Major projects of NIP identified for NCR: Delhi-Mumbai Expressway, Dwarka Expressway and Trans Haryana North-South Expressway, New airports at Jewar, modernization and expansion of airports across metro's in India.

2.3 Energy

24x7 clean and affordable power to be available to all households, industries, commercial businesses, agriculture in all states and union territories; Improving financial health of Discom; Medium term PPAs; Time



of Daytariffs; Improving subsidy policies; Quality baselinedata; Improved scheduling & forecasting; Public charging infrastructure; including e-highway infrastructure in select corridors; Power System modernization; Smart metering for all categories of customers, including prepaid meters

2.4 **Agriculture and irrigation**

Improving and modernising cold storage facilities, packaging and processing and processing units and storage infrastructure; Building of world class agriculture universities and R&D facilities; Doubling of farm incomes by upgrading of 22,000 rural haats into Gramin Agricultural; Markets (GrAM); Widespread adoption of e-NAM; Cropping & credit systems; Agri-education & extension systems; Ownership & tenancy; Robust IT and automated systems to track efficient use of water; Primary processing; Integrated physical market infra with digital e-marketplaces; Dedicated perishable logistics infra (road / rail / air-cargo)

Major projects of NIP identified for Haryana state of NCR: Conversion of rural haats into GrAM, agri-market infrastructure, computerization of primary agricultural credit societies, testing facilities, creation of cold chain facilities and mega food parks

2.5 **Education and skilling**

Remote learning; Digital learning solutions; Overall GER needs to improve to at least 40 percent; Focus on research, Grade level learning; HEIs in global ranking ; Upgrade medical colleges and institutes to strengthen higher education and R&D; Education institutes that provide state-of-the-art technology to drive learning in line with global peers

Major projects of NIP identified for Delhi and Uttar Pradesh in NCR: Construction of AIIMS and medical institutes, more IITs, Central Universities, NITs, IIMs, IISc, IISERs, and MHRD institutions and better school infrastructure and regional institute of education

2.6 **Urban and rural infrastructure**

Improved quality and connectivity of public and mass-transport system; Availability of public charging infrastructure within 3 km in all cities; 100 per cent of urban and rural households connected to piped-water supply; Slum population rehabilitated through PMAY; Number of green spaces to increase; Walkability within cities to improve and focus on river front development; Implementation of urban mobility solutions such as bicycles and e-bikes; All municipal solid waste to be collected and treated with advanced techniques; Use of advanced techniques to maintain water quality; All urban and rural households connected to piped-water supply Jal Jeevan Mission by 2024

Major projects of NIP: Affordable housing, mass rapid transit system, Smart City Mission, AMRUT, Jal Jeevan Mission, All rural households to have toilets and all villages to be ODF.

2.7 **Digital infrastructure**

Access to healthcare facilities to remote areas through mobile; Access to quality education to remote areas through mobile; 5G technology will fuel industry growth and adoption of IoT, cloud, AI and big data; Universal access of broadband by 2022; Provide seamless connectivity in remote areas

2.8 **Disaster resilience**

Ensuring disaster-resilient infrastructure; Increasing use of digital technologies in enhancing quality, safety, resilience and efficiency of infrastructure; Higher emphasis being placed on robust inclusive urban design and planning exercise to better handle any future disasters



Annexure D-4.2

AGRICULTURE AND ALLIED SERVICES**Agricultural and Processed Food Products Export Development Authority (APEDA)****1) Top 10 APEDA Export Products (2018-19):**

Basmati Rice (4723 USD Million), Buffalo Meat (3609 USD Million), Non-Basmati Rice (3048 USD Million), Groundnut (474 USD Million), Grapes (335 USD Million), Gherkin (206 USD Million), Mango Pulp (94 USD Million), Dehydrated Onion (103 USD Million), Pomegranate (99 USD Million), Mango (60 USD Million).

2) Top 10 export destinations:

- i. Vietnam - Buffalo Meat, Animal Casings, Groundnuts, Maize, Fresh Onions
- ii. Iran – Basmati/Non-Basmati Rice, Buffalo Meat, Processed Fruits, Juices & Nuts, Groundnuts
- iii. Saudi Arab – Basmati/Non-Basmati Rice, Buffalo Meat, Processed Fruits, Pulp, Juices & Nuts
- iv. UAE – Basmati/Non-Basmati Rice, Buffalo Meat, Alcoholic Beverages, Sheep or Goat Meat
- v. USA - Guar gum, Basmati Rice, Miscellaneous and Preparations, Natural Honey
- vi. Indonesia - Buffalo Meat, Groundnuts, Non-Basmati Rice, Miscellaneous Preparations, Cocoa
- vii. Nepal - Non Basmati Rice, Maize, Cereal Preparations, Other Fresh Vegetables, Wheat
- viii. Bangladesh - Non Basmati Rice, Fresh Onions, Maize, Other Fresh Fruits, Cereal Preparations
- ix. Malaysia - Buffalo Meat, Fresh Onions, Miscellaneous Preparations, Groundnuts, Basmati Rice
- x. Iraq - Basmati Rice, Buffalo Meat, Non-Basmati Rice, Pulses, Other Fresh Fruits

3) Interventions envisaged by APEDA for boosting the exports in NCR:**a. Pre- Harvest Interventions**

- i. More Number of FPOs/Co-operatives can be formed with the support of NABARD, SFAC, NCDC
- ii. Area expansion and Productivity enhancement
- iii. Up gradation of Package of practices
- iv. Area expansion of Organic Production
- v. Implementation of GAP
- vi. Fruit cap for protection of heat and pest (for Mango, kinnow, guava)
- vii. Irrigation System including source of water (Drip Irrigation)
- viii. Rejuvenation program for senile Mango orchards

b. Post -Harvest Interventions

- i. Mechanized/Manual harvester
- ii. Collection centre for export – Farm fresh fruits and vegetables can be consolidated and brought to a common Collection centre based on Hub and spoke model
- iii. Pack house for export Quality Certification
- iv. Facility of Plant Quarantine for PSC
- v. Processing unit (value added) for export Quality
- vi. Exportable Box /Bag manufacturer Unit

c. Infrastructure and Logistics

- i. Electricity supply in each cluster and facility centre



- ii. Adequate Water supply in each cluster and facility centre
- iii. Interior Roads to link the each cluster and facility centre
- iv. Transportation/Reefer Van/Availability of containers
- v. Requirement of ICDs
- vi. Exportable Box /Bag manufacturer Unit

d. **Quality**

- i. Recommended list of Pesticides and label claim
- ii. Integrated Pest and Disease Management
- iii. Identification of Pest free area
- iv. Requirement of Centre for excellence, if required
- v. Farmer registration in Hortinet for establishing Traceability
- vi. Have Food Testing Laboratories

e. **Market Linkages**

- i. Connecting with exporters
- iii. RBSM or BSM
- iv. Promotion program in abroad through EOI
- v. Promotion of “Brand India”
- vi. Market Intelligence

4) **Market Development- Farmer Connect Portal**

- a. The Farmer Connect portal which provides a platform for farmers and exporters to interact.
- b. Farmer Connect portal helps in conversion of underperforming farms into high yielding farms of quality products in demand, by leveraging ICT enabled services.
- c. The main objective of Farmer connect portal is to facilitate and integrate the activities of Farmer and aggregators in the form of Farmer producer Organization (FPO) with Exporters through the assistance of ICT platform.
- d. 840 FPOs has been registered in the portal till date

5) **APEDA’s Initiatives for implementation of Agri Export Policy**

Agri Export Policy (AEP) was announced in December 2018

- a. To double exports to USD 60 billion by 2022 in consonance with doubling the income of farmers.
- b. Policy was framed with “Farmers’ Centric Approach” for improved income by minimizing losses across the value chain.
- c. In this regard, APEDA has made an intensified approach for ensuring greater involvement of all the State Governments & UT’s for effective implementation of Agri Export Policy (AEP). Preparations of State action plan is at different stages of finalization in the States.

6) **Clusters Identified under AEP- 29 Clusters of 12 Products in 11 States covering 67 Districts. Further, for Cluster Development:**

- a. Cluster identification based on - existing exports, exporters operations, scalability of operations and potential for increase in export in short term.
- b. Focus on developing export oriented infrastructure in identified clusters with integrated post-harvest processing facilities, laboratories etc. with support from MOFPI / DoC (TIES) / DAC&FW (MIDH) / DAHDF (IDMF), etc.



- c. Concerned Organisations or Stakeholders to support :
 - i. Supply chain ownership/participation through farmer registrations,
 - ii. FPO formation,
 - iii. Provision of quality inputs,
 - iv. Price discovery,
 - v. Adoption of new technology,
 - vi. Farmer training through technical organizations
 - vii. Third party certification.
- d. Scheme to be implemented in partnership with private exporters with natural incentive to promote such clusters.
- e. Higher involvement and efforts of ICAR institutions / KVKs / extension machinery.

7) **Strategy and Action Plan**

- a. Leveraging Horticulture and Organic Production
- b. Enhancing efficiency of rural supply chains
- c. Optimum utilization of marketable surplus
- d. Improving quality and reaching international markets
- e. Capacity building and skill development

8) **APEDA's Promotional Financial Assistance Schemes**

- a. Export Infrastructure Development
 - i. Emphasis on setting up of post-harvest handling facilities.
 - ii. Financial assistance provided for setting up of infrastructure such as pack houses, refer van, VHT, HWT, cable system etc.
 - iii. Assistance also provided for processing facilities for addressing missing gap.
- b. Quality Development
 - i. Assistance provided for quality management system, lab equipment and testing of sample etc.
- c. Market Development
 - i. Activities covered include development and dissemination of data base and market intelligence, participation of trade fair, BSM, R-BSM, Events, trade delegation etc.
 - ii. Product development, R&D and enhancement of traceability etc



POWER SCENARIO OF NCR

Details of CEA 19th Electric Power Survey of India (EPS) (Volume-II) for NCR³⁶

1. **Power forecast for NCR:** The Report on Nineteenth Electric Power Survey of India (Volume-II) (National Capital Region), providing power forecasts for NCR and its sub-region (FY 2019-20 to 2029-30, indicates the following:
 - 1.1 Based on total electricity consumption and T&D Losses, the total energy requirement of NCR is expected to reach 127149 MU in year 2024-25 with CAGR of 4.38%.
 - 1.2 The energy requirement is estimated as 154916 MU by the year 2029-30 with CAGR of 4.03% for the period 2024-25 to 2029-30.
 - 1.3 The CAGR of energy requirement for the next ten years (2019-20 to 2029-30) is expected as 4.20% as per **Table D-4.3.1** and **Figure D-4.3.1**.
 - 1.4 The sub region wise peak demand forecast for NCR for the year 2030 is as follows:
 - (i) Haryana sub-region: 9,379 MW (32%),
 - (ii) Rajasthan sub-region: 1,978 MW (6.7%),
 - (iii) UP sub-region: 7,319 MW (25%) and
 - (iv) Delhi: 11,884 MW (40%). The peak demand for Delhi for the year 2036-37 has been estimated as 11549 MW
 - 1.5 CEA has worked out the long term Energy requirement and peak load of NCR constituent States till 2036-37., which has been given in the 19th EPS Report for NCR.
 - 1.6 However, figures for NCR portions of these States for post 2029-30 in five year periods up to 2041 have to be worked out by CEA.
 - 1.7 Peak Demand in MW terms for NCR is expected to see 6.14% CAGR upto 2024-25 and will reach 22070 MW in comparison to 16386 MW in year 2019-20.
 - 1.8 The CAGR of peak energy demand for the next ten years (2019-20 to 2029-30) is expected as 5.96 %.
 - 1.9 The Peak Demand for NCR is expected to reach 29,233 MW in year 2029-30 with a CAGR of 5.78% and 54,000 MW by 2041. (Refer **Figure D-4.3.2**).
 - 1.10 Category wise consumption forecast for 2024-25/2029-30 is given in **Figure D-4.3.3**.
 - 1.11 More NCR level details are given in **Figure D-4.3.4** and **Table D-4.3.2**. Sub-region wise Electrical energy consumption, Energy requirement & peak electricity demand are given as follows:
 - i) NCT Delhi – **Table D-4.3.3 & Figure D-4.3.5**
 - ii) Haryana Sub-region – **Table D-4.3.4 & Figure D-4.3.6**
 - iii) UP Sub-region – **Table D-4.3.5 & Figure D-4.3.7**
 - iv) Rajasthan Sub-region – **Table D-4.3.6 & Figure D-4.3.8**
 - v) DISCOM wise energy requirement NCR States & their DISCOMS up to 2026-27 given in **Table D-4.3.7**.
 - vi) Long term energy requirement and peak load of NCR constituent States -**Table D-4.3.8**.
 - vii) Actual NCR Sub-region District wise electricity demand and energy requirement for the FY. 2016-17 is given in **Table D-4.3.9**.

³⁶Report on Nineteenth Electric Power Survey of India (Volume-II) (National Capital Region), CEA, Ministry of Power, Government of India



- viii) Consumption profile user category wise of NCR in 2018-19 is given in **Figure D-4.3.9**. Sub-region wise energy requirement profile in 2018-19 in **Figure D-4.3.10**.

1.12 **Aggregate Technical and Commercial (AT&C) Losses:**

- i. AT&C losses have shown reducing trend in DISCOMS of NCT Delhi and Paschimanchal Vidyut Vitaran Limited (Uttar Pradesh), however in case of JVVNL (Rajasthan) the AT&C losses have increased from 22.66% to 33.08%.
- ii. Efforts are to be made by the constituent DISCOM to reduce the AT&C losses to the lowest level. The AT&C losses of Discoms supplying power to NCR are indicated in **Table D-4.3.10**.
- iii. Details of transmission and distribution (T&D) losses for DISCOMS's as per 19th Electric Power Survey (EPS) of CEA given in **Table D-4.3.11**.
- iv. Further T&D Losses as per EPS are targeted to bring down to about 11.51 % and 10.30 % by the end of 2024-25 & 2029-30 respectively as per **Figure D-4.3.11**.

1.13 **Past Electricity Demand for NCR:** NCRPB during 2018-19 undertook review of policies, proposals & recommendations of the RP-2021 and its implementation through an Experts Study Group constituted under CEA.

1.13.1 **Peak Deficit:**

- i. The Study Group observed that during 2012-13 there were peak power deficit of 5%, 9.5%, 4.8%, 13.6% in NCT Delhi, Haryana, Rajasthan and Uttar Pradesh sub-regions, respectively, whereas peak power deficit figures for Northern Region were 8.9%.
- ii. Over the years situation has improved as compared to 2012-13 and during 2018-19 the demand not met figures were 2.1% for Uttar Pradesh and other states of NCR are able to meet the peak demand however in Northern Region the peak demand not met is about 2.3%.
- iii. During 2012-13 energy demand not met figures were 0.5%, 7.7%, 3% and 6% in Delhi, Haryana, Rajasthan and Uttar Pradesh sub-regions, respectively.
- iv. Further, situation has improved and **the figures of energy demand not met during 2018-19 were 0.1%, 0.2%, 0.8% in respect of Delhi, Rajasthan and Uttar Pradesh respectively.**
- v. Northern Region as a whole has seen the improvement from 9.2% to 1.4% over the period. However, efforts are still to be made to improve the power supply position in NCR.

1.13.2 **Comparison of power supply position from 2016-17 to 2018-19:**

- i. This is given in **Table D-4.3.12**, whereas comparison of energy and power deficit from 2012-13 to 2018-19 is given in **Table D-4.3.13**.
- ii. **Table D-4.3.14** gives Electrical Energy Consumption, Energy Requirement and Peak Electricity Demand for NCR with year-wise and consumer category-wise estimates from 2021-22 to 2029-30 (MU/MW).

1.14 **Analysis of Current NCR Electrical Energy Requirement:** Haryana sub region and NCT Delhi had the most of NCR electrical energy requirement in 2018-19 followed by Uttar Pradesh & Rajasthan sub region. Haryana sub region and NCT Delhi had almost equal energy requirement in 2018-19 constituting about 34% & 33% of the total NCR energy requirement respectively, whereas their area shares in NCR differ substantially (2.69 % & 46 % respectively). The comparison of energy data of NCR with the entire Northern Region for the year 2018-19 indicates that the energy requirement of NCR was more than one fourth (26.03 %) of total Northern Region Energy Requirement. Energy requirement of NCR was 7.75 % of the total energy requirement of the country whereas its contribution in area and population were 1.68 % and 4.96 % only. It shows comparatively huge concentration of energy demand in the NCR region (**Refer Table D-4.3.15**).



Table D-4.3.1: Expected CAGR of NCR - Category Wise Consumption (FY 2019-20 to 2029-30)

Sl. No.	Category	Energy Consumption CAGR in %		
		2019-20 to 2024-25	2024-25 to 2029-30	2019-20 to 2029-30
1.	Domestic	5.25	4.44	4.85
2.	Commercial	4.97	4.68	4.83
3.	Industrial	4.22	4.00	4.11
4.	Irrigation	4.10	3.89	4.00
5.	Others	5.14	4.63	4.88
6.	Total	4.78	4.31	4.55

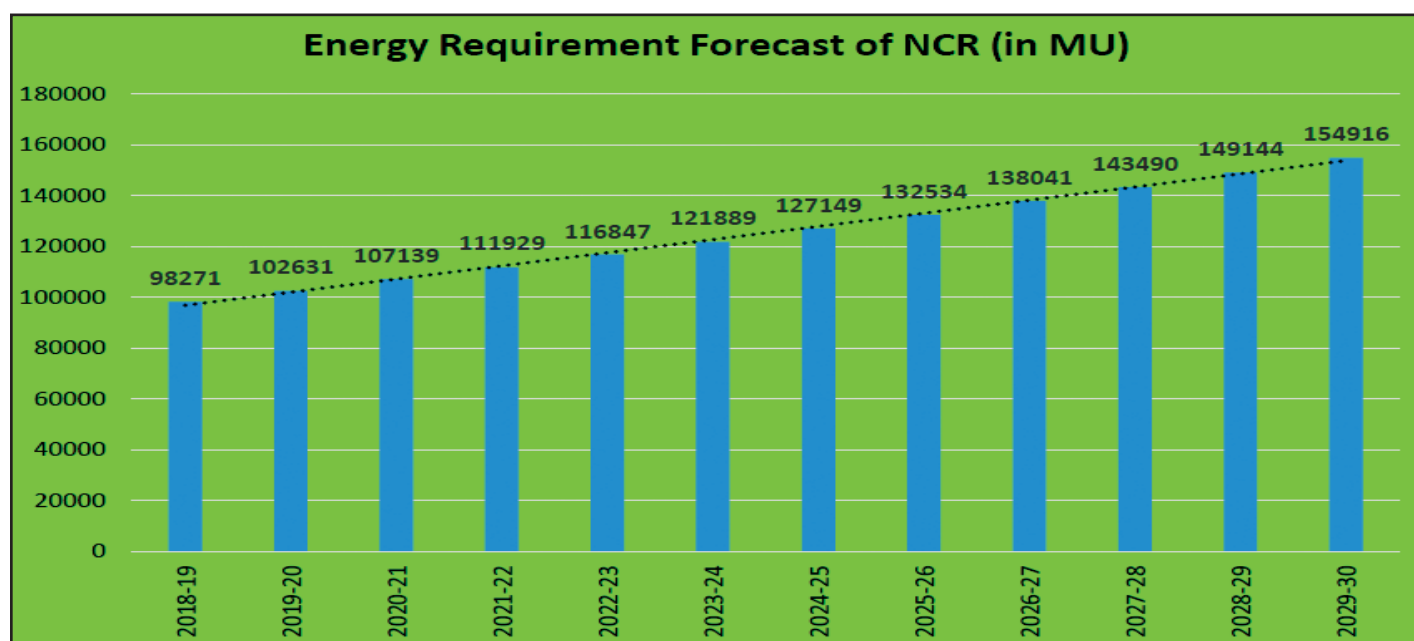


Figure D-4.3.1: Energy Requirement Forecast of NCR (FY 2018-19 to 2029-30)

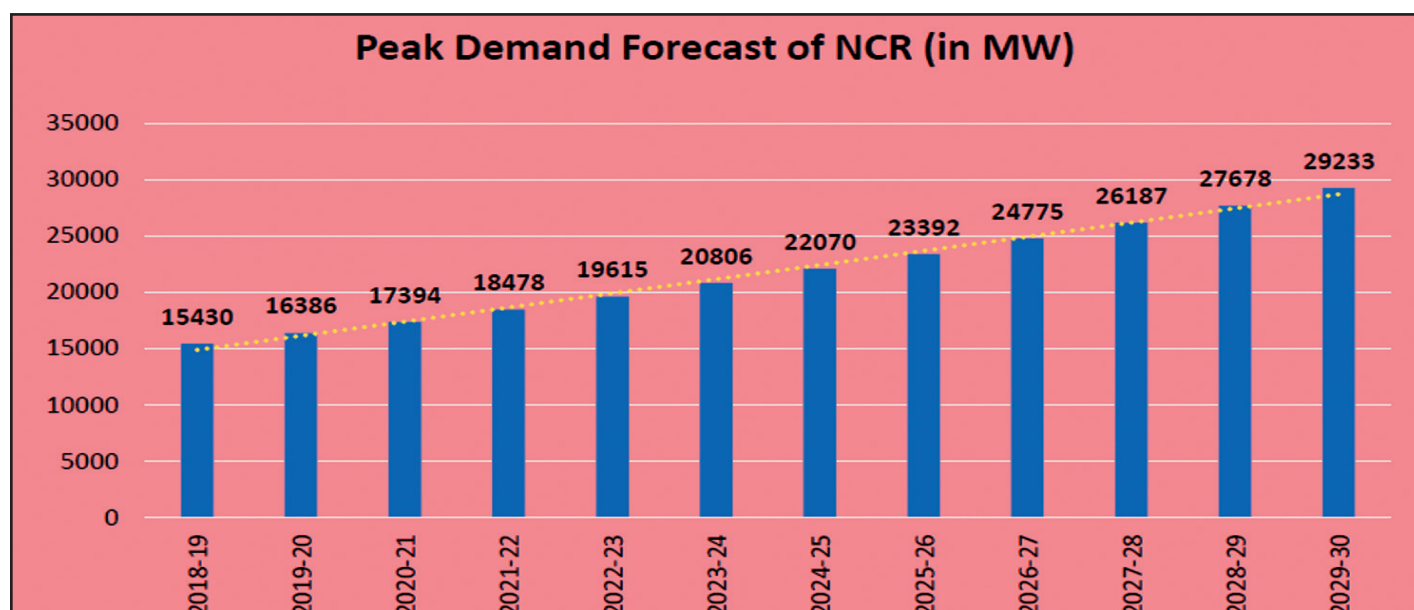


Figure D- 4.3.2: Peak Demand Forecast of NCR (FY 2018-19 to 2029-30)

Source: CEA, Power sector Review Report on RP-2021



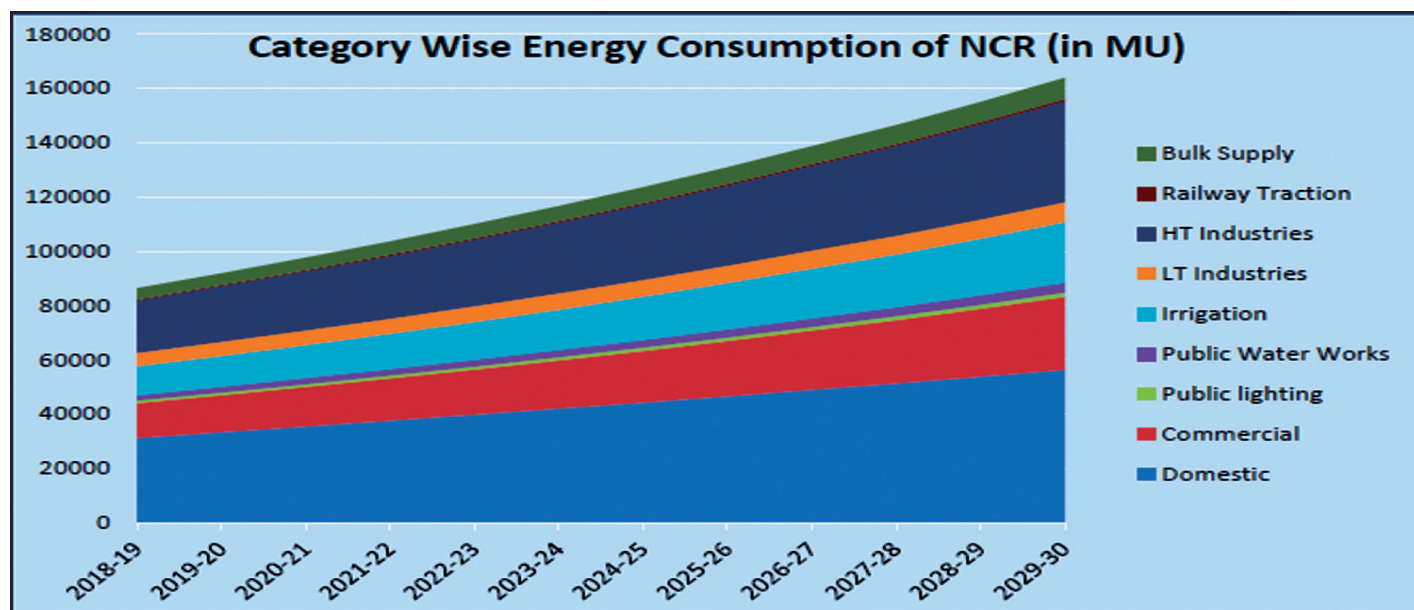


Figure D-4.3.3: Category wise forecast of consumption in energy for 2024-25/2029-30

Source: CEA, Power sector Review Report on RP-2021

Table D-4.3.2: Category wise NCR Forecast (2019-20 to 2029-30)

National Capital Region											
Electrical Energy Consumption, Energy Requirement and Peak Electricity Demand											
(Category Wise and Year Wise Summary)											
Year	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Domestic	32225	34033	35878	37760	39675	41625	43605	45615	47591	49639	51724
Commercial	13142	13801	14491	15213	15966	16752	17568	18415	19271	20155	21060
Public lighting	935	980	1027	1074	1123	1173	1223	1276	1328	1383	1440
Public Water Works	2073	2181	2295	2414	2538	2669	2805	2948	3095	3250	3412
Irrigation	11138	11605	12085	12579	13090	13617	14160	14721	15273	15869	16482
LT Industries	5079	5265	5452	5643	5835	6030	6226	6424	6624	6830	7040
HT Industries	19350	20217	21116	22048	23012	24010	25042	26108	27201	28337	29508
Railway Traction	504	520	538	556	575	595	618	642	666	691	717
Bulk Supply	4650	4912	5184	5465	5753	6049	6351	6657	6965	7273	7580
Total (Energy Consumption)	89096	93515	98066	102751	107568	112519	117599	122805	128013	133426	138964
T&D losses -MU	13535	13624	13863	14096	14321	14630	14935	15236	15476	15718	15952
T&D losses -in %	13.19	12.72	12.39	12.06	11.75	11.51	11.27	11.04	10.79	10.54	10.30
Energy Requirement - MU	102631	107139	111929	116847	121889	127149	132534	138041	143490	149144	154916
Annual Load Factor - %	71.50	70.31	69.15	68.00	66.88	65.77	64.68	63.61	62.55	61.51	60.49
Peak Load - MW	16386	17394	18478	19615	20806	22070	23392	24775	26187	27678	29233

Source: CEA, Power sector Review Report on RP-2021



Figure D-4.3.4: Category wise consumption forecast for NCR

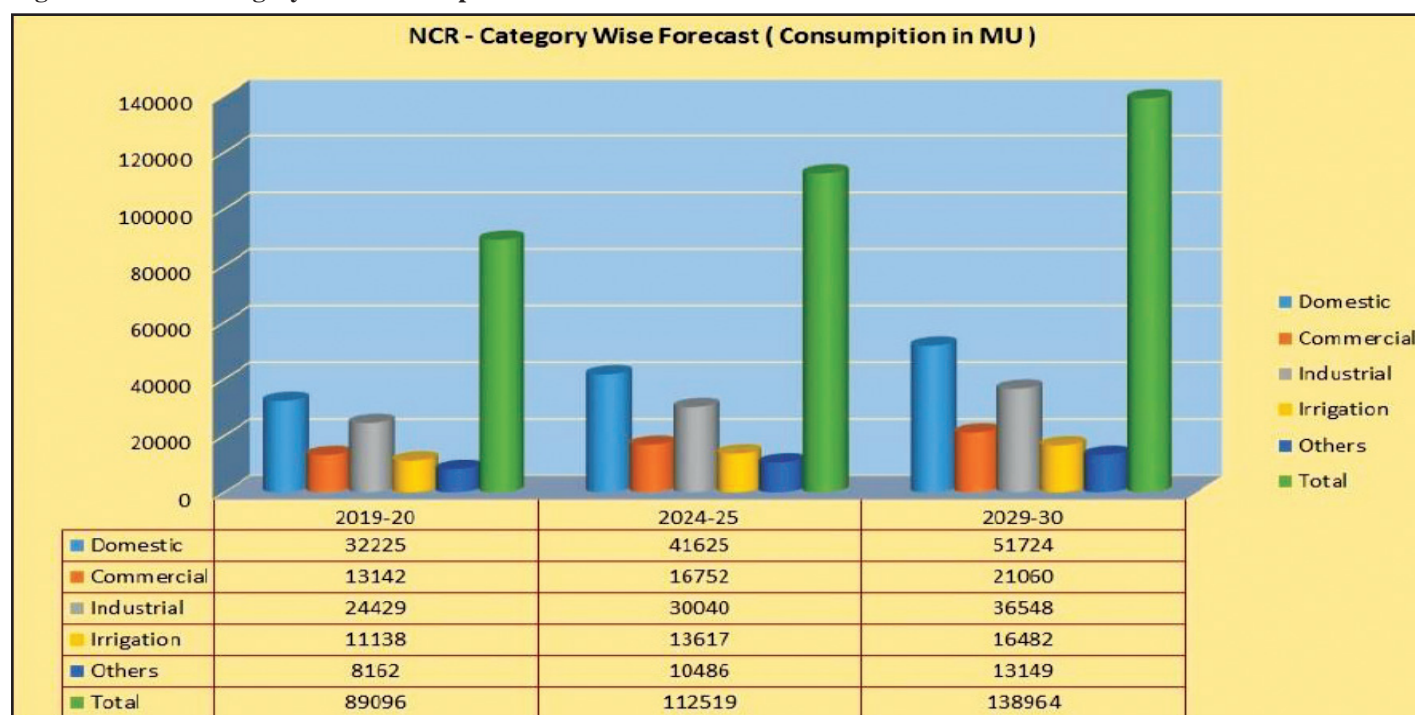


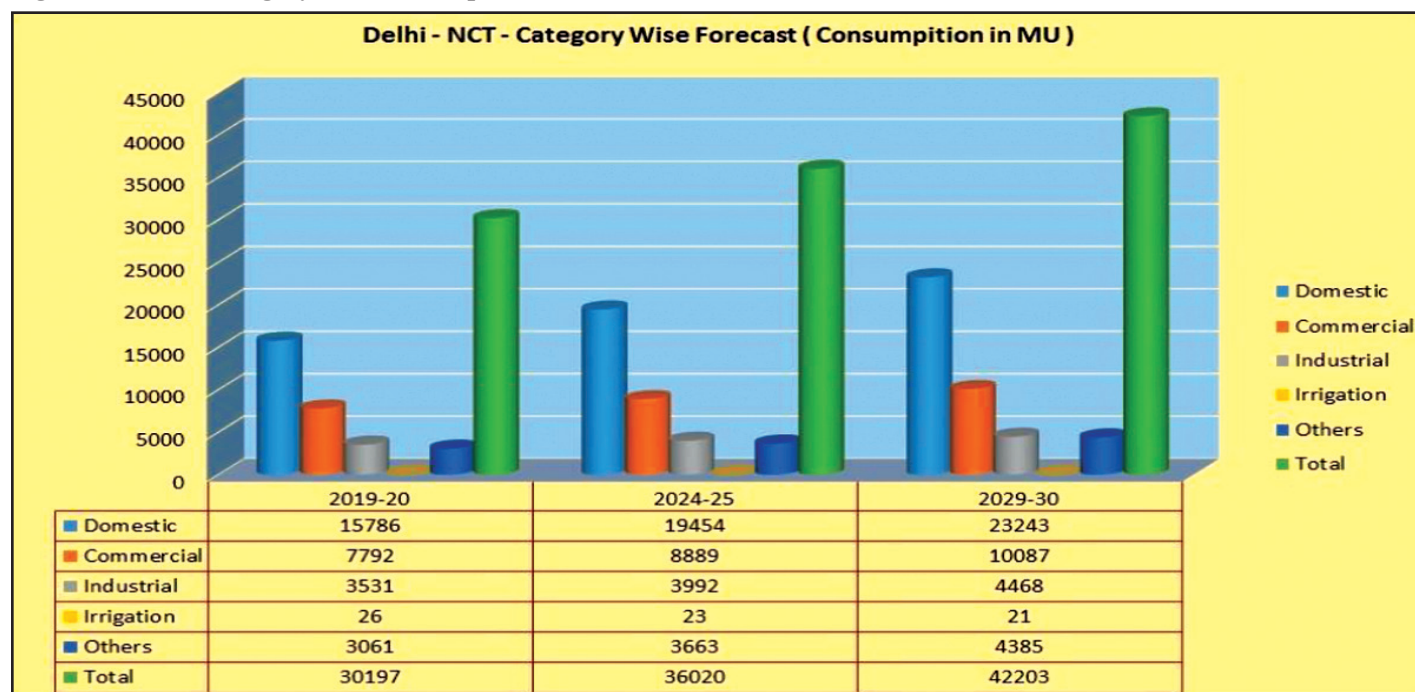
Table D-4.3.3: Category wise NCT of Delhi Forecast (2019-20 to 2029-30)

Delhi - NCT											
Electrical Energy Consumption, Energy Requirement and Peak Electricity Demand											
(Category Wise and Year Wise Summary)											
Year	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Domestic	15786	16502	17228	17963	18705	19454	20206	20964	21697	22457	23243
Commercial	7792	8002	8216	8435	8660	8889	9125	9366	9601	9841	10087
Public lighting	577	605	633	662	691	720	751	781	813	845	879
Public Water Works	707	741	776	813	851	891	933	976	1020	1066	1114
Irrigation	26	25	25	24	24	23	23	22	22	21	21
LT Industries	3001	3089	3176	3264	3351	3439	3526	3614	3704	3797	3891
HT Industries	530	535	539	544	549	553	558	562	567	572	576
Railway Traction	104	108	112	117	121	126	132	139	146	153	161
Bulk Supply	1673	1719	1767	1818	1870	1925	1982	2042	2103	2166	2231
Total (Energy Consumption)	30197	31326	32473	33639	34821	36020	37235	38467	39672	40917	42203
T&D losses -MU	4345	4381	4411	4434	4450	4553	4653	4752	4801	4849	4896
T&D losses -in %	12.58	12.27	11.96	11.65	11.33	11.22	11.11	11.00	10.80	10.60	10.40
Energy Requirement - MU	34542	35707	36884	38073	39272	40573	41888	43219	44473	45767	47099
Annual Load Factor - %	53.29	52.42	51.57	50.73	49.91	49.10	48.30	47.52	46.75	45.99	45.24
Peak Load - MW	7400	7776	8164	8567	8982	9433	9899	10382	10860	11360	11884

Source: CEA, Power sector Review Report on RP-2021



Figure D- 4.3.5: Category wise consumption forecast for NCT of Delhi



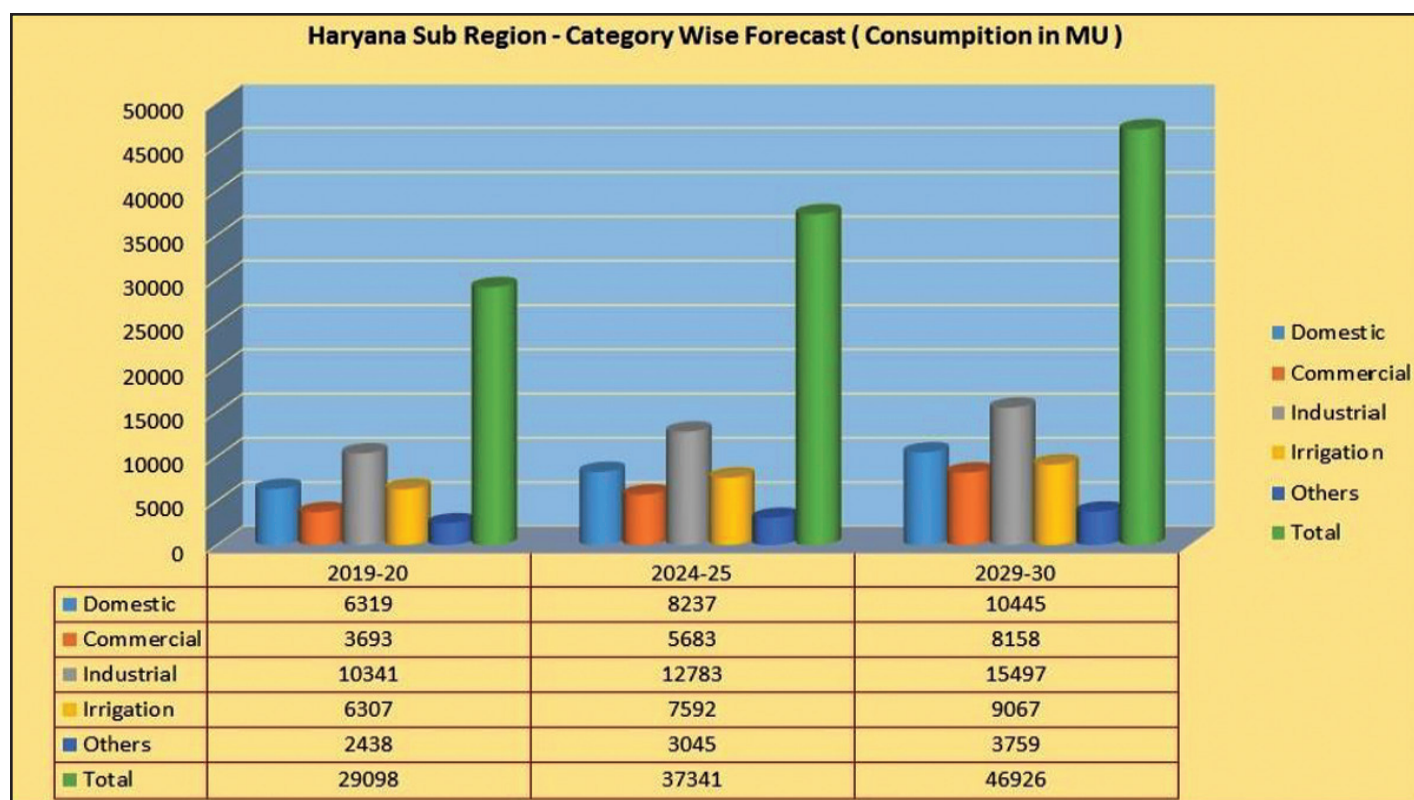
Source: CEA, Power sector Review Report on RP-2021

Table D-4.3.4: Category wise forecast for Haryana Sub region (2019-20 to 2029-30)

Haryana Sub Region											
Electrical Energy Consumption, Energy Requirement and Peak Electricity Demand											
(Category Wise and Year Wise Summary)											
Year	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Domestic	6319	6677	7048	7432	7828	8237	8658	9090	9532	9984	10445
Commercial	3693	4044	4419	4818	5239	5683	6147	6629	7127	7638	8158
Public lighting	108	114	120	125	132	138	144	151	158	164	171
Public Water Works	831	870	910	951	994	1038	1083	1130	1178	1228	1279
Irrigation	6307	6548	6797	7054	7319	7592	7872	8159	8455	8757	9067
LT Industries	943	984	1025	1068	1112	1157	1203	1250	1299	1348	1399
HT Industries	9398	9821	10256	10702	11159	11626	12103	12590	13085	13588	14099
Railway Traction	314	319	325	331	337	343	349	355	361	367	373
Bulk Supply	1184	1248	1314	1382	1453	1527	1604	1683	1765	1849	1936
Total (Energy Consumption)	29098	30624	32213	33863	35573	37341	39163	41037	42959	44923	46926
T&D losses -MU	5291	5388	5486	5582	5677	5770	5860	5947	6031	6110	6183
T&D losses -in %	15.39	14.96	14.55	14.15	13.76	13.38	13.02	12.66	12.31	11.97	11.64
Energy Requirement - MU	34389	36012	37699	39445	41250	43111	45023	46984	48990	51033	53109
Annual Load Factor - %	60.04	60.49	60.94	61.39	61.84	62.30	62.76	63.23	63.70	64.17	64.64
Peak Load - MW	6538	6796	7062	7335	7614	7899	8189	8483	8780	9079	9379

Source: CEA, Power sector Review Report on RP-2021





Source: CEA, Power sector Review Report on RP-2021

Figure D-4.3.6: Category wise consumption forecast for Haryana Sub-region

Table D-4.3.5: Category wise forecast for Uttar Pradesh Sub-region (2019-20 to 2029-30)

Uttar Pradesh Sub Region											
Electrical Energy Consumption, Energy Requirement and Peak Electricity Demand											
(Category Wise and Year Wise Summary)											
Year	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Domestic	9139	9809	10490	11183	11890	12610	13344	14091	14817	15579	16344
Commercial	1344	1421	1500	1581	1664	1751	1842	1937	2033	2138	2248
Public lighting	215	225	234	244	255	265	276	288	299	311	323
Public Water Works	441	473	506	542	580	621	665	712	761	815	873
Irrigation	2678	2798	2918	3040	3165	3293	3425	3561	3674	3817	3964
LT Industries	1010	1061	1114	1167	1221	1276	1331	1388	1442	1499	1555
HT Industries	6759	7071	7400	7747	8112	8499	8906	9336	9783	10262	10767
Railway Traction	86	93	100	108	117	126	137	148	159	170	183
Bulk Supply	1727	1876	2030	2189	2351	2516	2681	2845	3008	3166	3319
Total (Energy Consumption)	23401	24827	26293	27801	29356	30957	32608	34306	35975	37757	39576
T&D losses -MU	2560	2619	2731	2843	2957	3073	3190	3307	3419	3538	3657
T&D losses -in %	9.86	9.54	9.41	9.28	9.15	9.03	8.91	8.79	8.68	8.57	8.46
Energy Requirement - MU	25961	27446	29024	30645	32313	34030	35798	37614	39394	41295	43234
Annual Load Factor - %	72.55	72.02	71.50	70.98	70.46	69.95	69.44	68.93	68.43	67.93	67.43
Peak Load - MW	4085	4350	4634	4929	5235	5554	5885	6229	6572	6940	7319

Source: CEA, Power sector Review Report on RP-2021



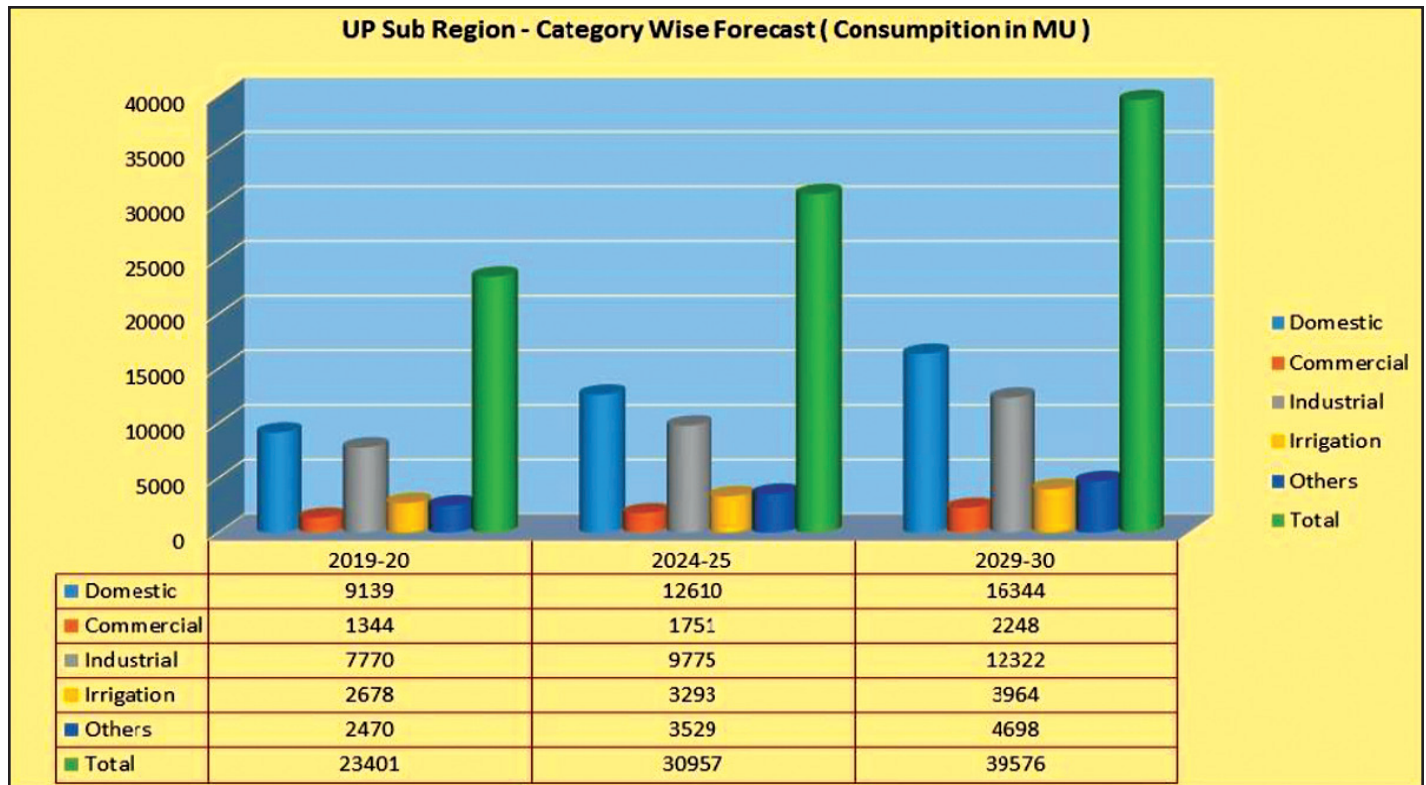


Figure D-4.3.7: Category wise consumption forecast for UP Sub-region

Source: CEA, Power sector Review Report on RP-2021

Table D-4.3.6: Category wise forecast for Rajasthan Sub-region (2019-20 to 2029-30)

Rajasthan Sub Region											
Electrical Energy Consumption, Energy Requirement and Peak Electricity Demand											
(Category Wise and Year Wise Summary)											
Year	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Domestic	980	1045	1113	1182	1252	1324	1397	1471	1545	1619	1693
Commercial	312	334	356	379	403	429	455	482	510	539	568
Public lighting	34	37	40	43	46	49	52	56	59	63	67
Public Water Works	93	98	103	108	114	119	124	130	135	141	146
Irrigation	2128	2234	2345	2461	2582	2708	2840	2978	3123	3273	3430
LT Industries	124	130	137	144	151	158	165	172	180	187	194
HT Industries	2663	2790	2921	3055	3192	3332	3474	3619	3766	3916	4067
Railway Traction	0	0	0	0	0	0	0	0	0	0	0
Bulk Supply	66	69	72	75	78	81	84	87	89	92	95
Total (Energy Consumption)	6400	6738	7087	7447	7818	8200	8592	8995	9407	9829	10259
T&D losses -MU	1339	1236	1237	1237	1236	1235	1232	1229	1225	1221	1215
T&D losses -in %	17.30	15.50	14.86	14.24	13.65	13.09	12.54	12.02	11.53	11.05	10.59
Energy Requirement - MU	7739	7974	8323	8684	9054	9435	9825	10224	10633	11050	11474
Annual Load Factor - %	70.11	69.71	69.31	68.92	68.52	68.13	67.74	67.35	66.97	66.58	66.20
Peak Load - MW	1260	1306	1371	1438	1508	1581	1656	1733	1813	1894	1978

Source: CEA, Power sector Review Report on RP-2021



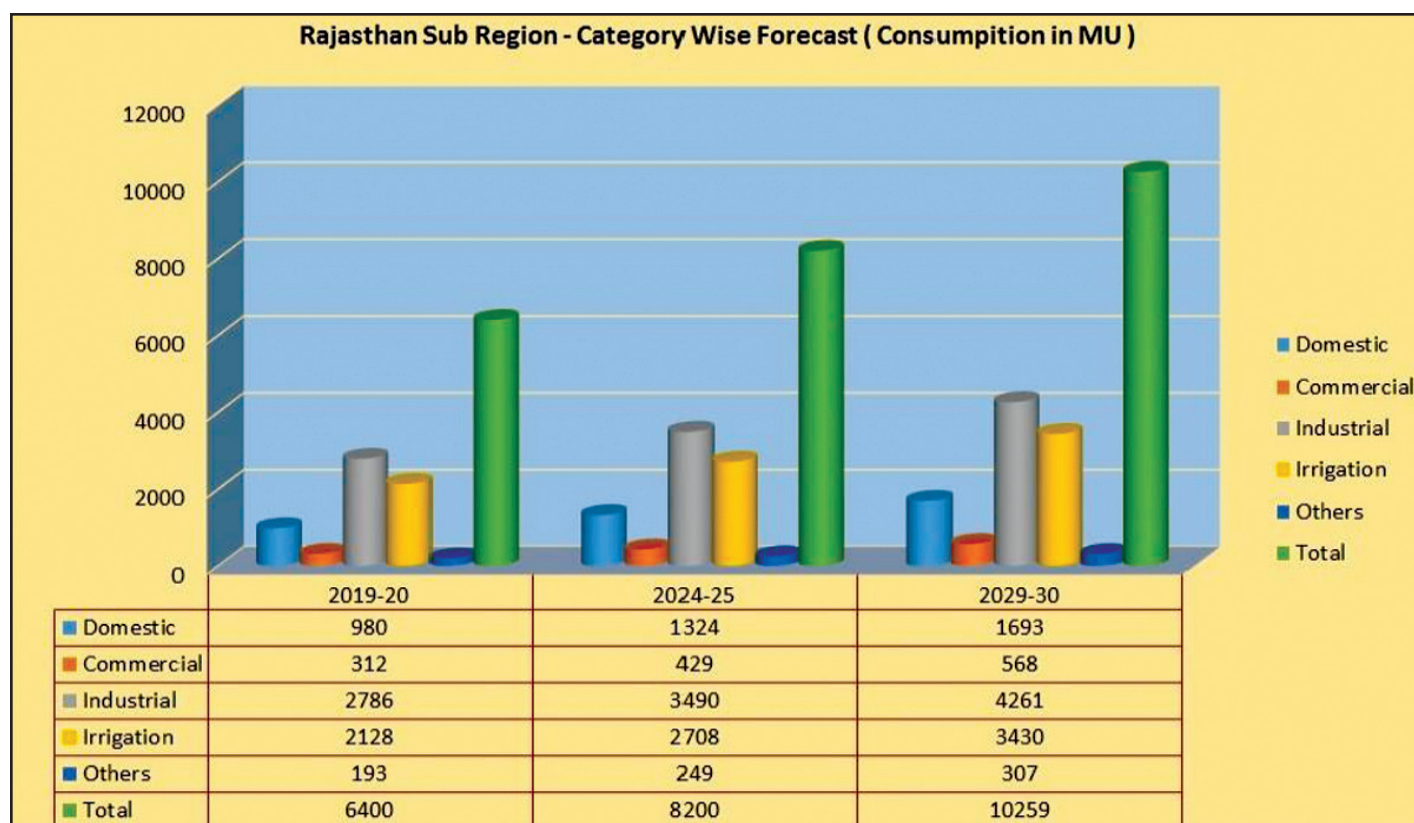


Figure D-4.3.8: Category wise consumption forecast for Rajasthan Sub region

Source: CEA, Power sector Review Report on RP-2021

Table D-4.3.7: Energy requirement of the States and their DISCOMS up to 2026-27 (as per 19th EPS)

Energy Requirement (MU)											
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Delhi	31937	33070	34401	35380	36573	37778	38997	40224	41557	42904	44267
NDMC	1600	1627	1655	1684	1713	1743	1773	1804	1835	1867	1900
BYPL	7259	7545	7842	8153	8470	8790	9113	9438	9665	10091	10418
BRPL	12803	13234	13680	14143	14613	15093	15584	16082	16682	17295	17922
TPDDL	9269	9625	9948	10290	10630	10968	11305	11640	11975	12309	12643
MES	250	257	265	273	281	289	298	307	316	326	336
HYN	48991	51254	54062	57083	60336	63618	66747	70333	75110	80239	85743
DHBVN	26553	28068	30058	32196	34493	36963	39234	42142	45271	48639	52262
UHBVN	21436	22138	22898	23721	24609	25345	26149	26752	28303	29960	31727
UP	108070	115688	123951	132476	141426	150797	159412	167731	176477	185674	195323
MVVNL	18874	20706	22681	24728	26919	29256	31626	34094	36683	39389	42199
PUVVNL	24287	26140	28136	30077	32007	33906	35489	36954	38484	40090	41766
PVVNL	33136	35397	38709	40388	43141	46083	48593	51021	53570	56252	59063
DVVNL	28580	30103	31702	33379	35122	36940	38686	40201	41779	43428	45145
NPC	1688	1730	1896	2059	2258	2511	2799	3126	3503	3929	4429
Raj	73222	76569	79485	83168	87051	91216	95782	101200	108808	117219	126290
AVVNL	19236	20032	20715	21491	22372	23302	24330	25380	27108	29054	31111
JdVVNL	23785	25424	26905	28622	30449	32527	34816	37855	41220	44960	49093
JVVNL	27954	28762	29425	30502	31557	32587	33695	34858	37140	39606	42209



Peak Demand (MW)											
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Delhi	6318	6541	6764	6997	7233	7471	7712	7954	8217	8482	8751
HYN	9428	9861	10397	10975	11596	12222	12819	13501	14415	15398	16451
UP	16067	17379	18821	20334	21948	23664	25331	26658	28053	29522	31064
Raj	11535	12070	12540	13133	13761	14435	15176	16048	17282	18651	20131

Table D-4.3.8: Long term Energy requirement and peak load of NCR Constituent States

	Energy Requirement (MU)				Peak demand (MW)			
	2021-22	2026-27	2031-32	2036-37	2021-22	2026-27	2031-32	2036-37
Delhi	37778	44267	51850	61085	7471	8751	10139	11549
HYN	63618	85743	105853	126074	12222	16451	20046	23486
UP	150797	195323	234290	284645	23664	31064	38885	48498
Raj	91216	126290	161606	199552	14435	20131	26575	34000

Table D-4.3.9: District wise Electricity Demand & Energy Requirement for NCR (FY2016-17)

Sub-Region	Districts	Energy Consumption for 2015-16 (MU)	Energy Consumption for 2016-17 (MU)	Growth (%)	T&D Losses (%)	Energy Requirement (MU)	Peak load (MW)
1	2	3	4	5(4-3/3)	6	7(4+6)	8
Haryana	Karnal	2873	2892	0.69	32.40	4279	1595
	Panipat	5629	5726	1.72	25.66	7703	855
	Rohtak	895	959	7.26	39.44	1584	416
	Jhajjar	1101	1003	-8.89	35.48	1554	727
	Sonepat	1791	1969	9.96	25.90	2657	907
	Faridabad	3020	3136	3.84	12.62	3589	1377
	Mewat	61	65	8.14	59.40	161	49
	Gurgaon	5555	5769	3.86	10.11	6418	2231
	Rewari	1333	1357	1.83	21.38	1726	325
	Palwal	647	864	33.61	35.31	1336	322
	Bhiwani & Charkhi Dadri**	1494	1591	6.55	33.61	2397	569
	Mahendargarh	576	713	23.78	28.43	997	225
	Jind	1049	1128	7.47	38.37	1830	719
Uttar Pradesh	Ghaziabad	4187	4392	4.90	11.38	4956	2492
	Hapur	570	650	13.97	15.22	766	302
	Bulandshar	1560	1780	14.09	18.52	2184	916
	Gautam Budh Nagar	3987	4369	9.58	6.21	4659	1200
	Muzzafarnagar	1287	1440	11.87	21.03	1824	2059
	Bagpat*						
	Meerut*						
	Shamli*						
Rajasthan	Alwar	4092	4530	10.69	23.91	5953	950
	Bharatpur	805	865	7.44	47.25	1639	343
Delhi	Delhi	25658	26604	3.69	19.37	32996	6342
	Total	68169	71804	5.33		91208	22152

** Charkhi Dadri- Recently formed in the year 2016. Before that, it was a part of Bhiwani hence data is included in Bhiwani district upto 2016

* Data yet to be received for Merrut, Bagpat and Shamli

Source: CEA, Power sector Review Report on RP-2021



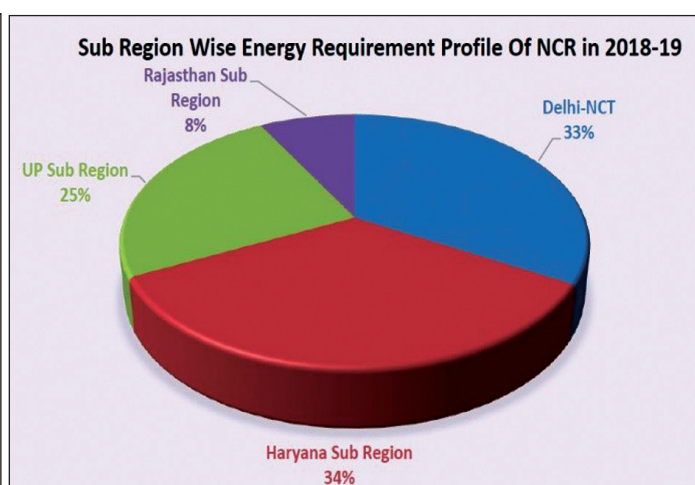
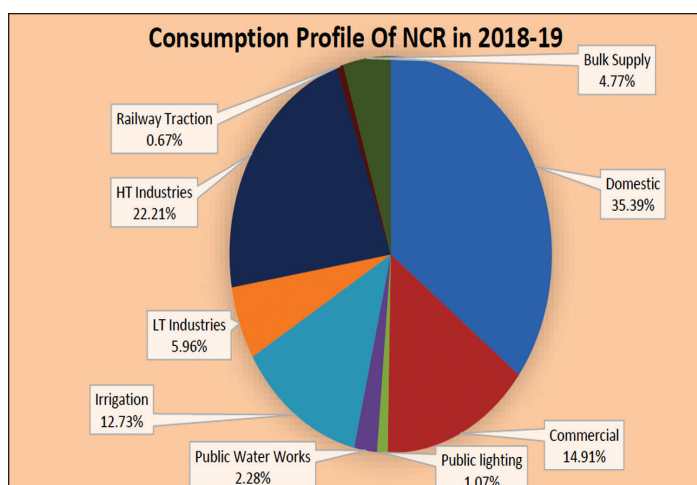
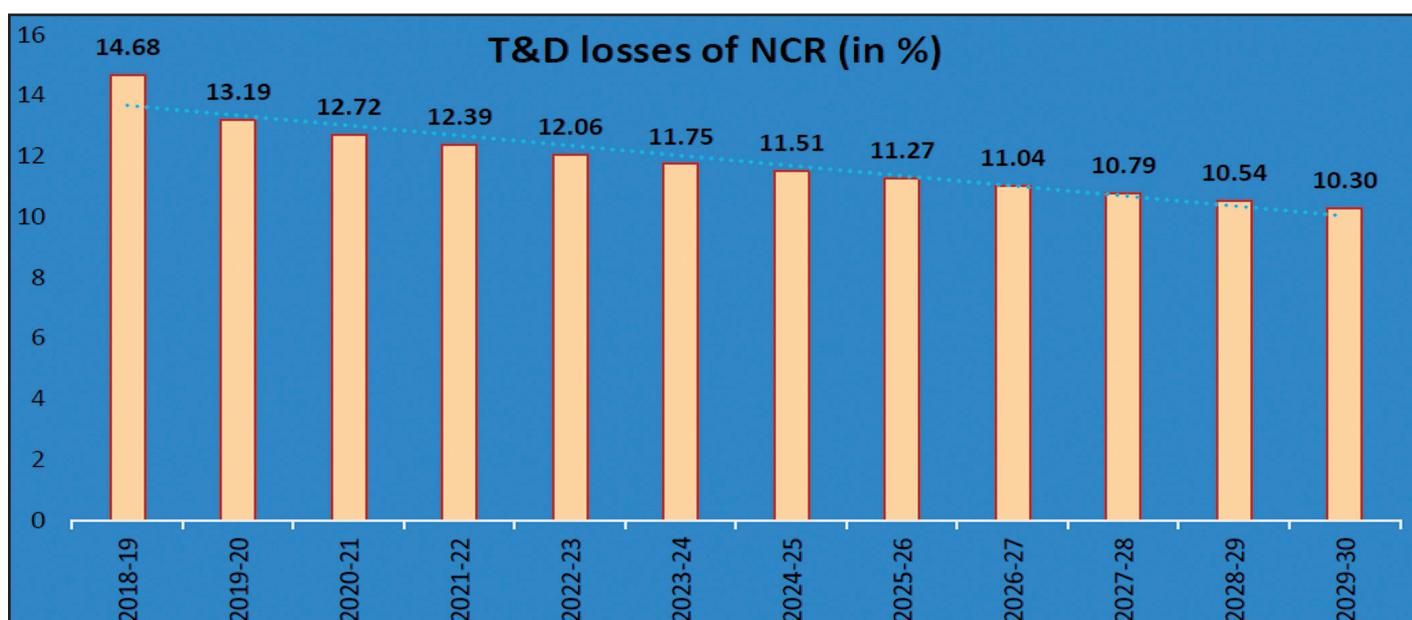


Figure D-4.3.9: Energy Consumption Profile of NCR in 2018-19

Figure D-4.3.10: Sub-region wise Energy Requirement Profile of NCR in 2018-19

Source: Report on Nineteenth Electric Power Survey of India (Volume-II) (National Capital Region), CEA, Ministry of Power, Government of India



Source: CEA, Power sector Review Report on RP-2021

Figure D-4.3.11: T&D Loss Forecast of NCR (FY 2018-19 to 2029-30)

Table D-4.3.10: AT&C losses of DISCOMS supplying power to NCR

State		2010-11	2015-16
Delhi	BRPL	15.80	13.29
	BYPL	18.13	15.39
	TPDDL	13.75	8.90
Delhi total		15.76	12.47
Haryana	DHBVNL	26.29	30.23
	UHBVNL	29.85	35.03
Haryana Total		28.02	32.35
Rajasthan	JVVNL	22.66	33.08
Uttar Pradesh	PVVNL	31.61	25.79
All India		26.15	23.98

Source: CEA, Power sector Review Report on RP-2021



Table D-4.3.11: Transmission and distribution (T&D) losses for DISCOMS's as per the trajectory of loss reduction adopted in 19th Electric Power Survey (EPS) – (2017 – 2027)

	T&D losses (in %)										
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Delhi	15.68	15.31	14.95	14.65	14.35	14.04	13.74	13.43	13.32	13.21	13.10
NDMC	13.82	13.72	13.62	13.52	13.42	13.32	13.22	13.12	13.02	12.92	12.82
BYPL	18.64	18.19	17.74	17.29	16.84	16.39	15.94	15.49	15.04	14.59	14.14
BRPL	13.70	13.20	12.70	12.20	11.70	11.20	10.70	10.20	10.20	10.20	10.20
TPDDL	9.70	9.50	9.30	9.30	9.30	9.30	9.30	9.30	9.30	9.30	9.30
MES	9.43	9.44	9.43	9.43	9.44	9.43	9.43	9.43	9.43	9.43	9.43
HYN	26.99	24.99	23.52	22.07	20.64	19.22	17.82	16.74	16.74	16.74	16.74
DHBVN	22.00	20.00	19.00	18.00	17.00	16.00	15.00	15.00	15.00	15.00	15.00
UHBVN	29.77	27.77	25.77	23.77	21.77	19.77	17.77	15.00	15.00	15.00	15.00
UP	27.42	26.57	25.70	24.84	23.98	23.12	22.26	21.40	20.54	19.69	18.84
MVVNL	25.10	24.20	23.30	22.40	21.50	20.60	19.70	18.80	17.90	17.00	16.10
PUVVNL	26.00	25.20	24.40	23.60	22.80	22.00	21.20	20.40	19.60	18.80	18.00
PVVNL	25.30	24.60	23.90	23.20	22.50	21.80	21.10	20.40	19.70	19.00	18.30
DVVNL	29.90	28.80	27.70	26.60	25.50	24.40	23.30	22.20	21.10	20.00	18.90
NPC	8.56	8.57	8.75	8.80	8.85	8.90	8.95	9.00	9.15	9.20	9.50
Raj	29.02	27.03	25.05	23.09	21.14	19.19	17.33	15.98	16.00	16.01	16.03
AVVNL	26.30	24.23	22.17	20.11	18.04	15.98	13.92	11.85	11.85	11.85	11.85
JdVVNL	23.46	21.91	20.37	18.82	17.27	15.72	14.37	14.37	14.37	14.37	14.37
JVVNL	29.92	27.54	25.15	22.77	20.39	18.01	15.63	13.25	13.28	13.30	13.31

Source: CEA, Power sector Review Report on RP-2021

Table D-4.3.12: Comparison of Power Supply Position (2016-17 to 2018-19)

2016-17								
	Energy requirement (MU)	Energy supplied (MU)	Energy not supplied		Peak demand (MW)	Peak Met (MW)	Demand not Met	
			(MU)	(%)			(MW)	(%)
Delhi	30829	30797	32	0.1	6342	6261	81	1.3
Haryana	48895	48895	0	0	9262	9262	0	0
Rajasthan	67838	67415	423	0.6	10613	10348	265	2.5
Uttar Pradesh	107569	105701	1868	1.7	17183	16110	1073	6.2
Northern Region	349172	343513	5659	1.6	53372	52612	760	1.4
2017-18								
State	Energy requirement (MU)	Energy supplied (MU)	Energy not supplied		Peak demand (MW)	Peak Met (MW)	Demand not Met	
			(MU)	(%)			(MW)	(%)
Delhi	31826	31806	19	0.1	6553	6526	27	0.4
Haryana	50775	50775	0	0	9671	9539	132	1.4
Rajasthan	71194	70603	591	0.8	11722	11564	158	1.3
Uttar Pradesh	120052	118303	1749	1.5	20274	18061	2213	10.9
Northern Region	371934	365723	6211	1.7	60749	58448	2301	3.8
2018-19								
State	Energy requirement (MU)	Energy supplied (MU)	Energy not supplied		Peak demand (MW)	Peak Met (MW)	Demand not Met	
			(MU)	(%)			(MW)	(%)
Delhi	32299	32282	17	0.1	7016	7016	0	0
Haryana	53665	53665	0	0	10270	10270	0	0
Rajasthan	79826	79637	189	0.2	13276	13276	0	0
Uttar Pradesh	117101	116118	984	0.8	20498	20062	436	2.1
Northern Region	383028	377776	5251	1.4	63166	61726	1440	2.3

Source: CEA, Power sector Review Report on RP-2021



Table D-4.3.13: Comparison of Energy and Power Deficit (2012-13 to 2018-19)

State	Energy not supplied				Demand not Met			
	(MU)	(%)	(MU)	(%)	(MW)	(%)	(MW)	(%)
	2012-13		2018-19		2012-13		2018-19	
Delhi	138	0.5	17	0.1	300	5.0	0	0
Haryana	3198	7.7	0	0	707	9.5	0	0
Rajasthan	1670	3	189	0.2	425	4.8	0	0
Uttar Pradesh	15201	16.6	984	0.8	1892	13.6	436	2.1
Northern Region	27534	9.2	5251	1.4	4070	8.9	1440	2.3

Source: Source: CEA, Power sector Review Report on RP-2021

Table D-4.3.14: Electrical Energy Consumption, Energy Requirement and Peak Electricity Demand for NCR with year-wise and consumer category-wise estimates from 2021-22 to 2029-30 (MU/MW)

Category/ Year	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Domestic	35878	37760	39675	41625	43605	45615	47591	49639	51724
Commercial	14491	15213	15966	16752	17568	18415	19271	20155	21060
Public lighting	1027	1074	1123	1173	1223	1276	1328	1383	1440
Public Water Works	2295	2414	2538	2669	2805	2948	3095	3250	3412
Irrigation	12085	12579	13090	13617	14160	14721	15273	15869	16482
LT Industries	5452	5643	5835	6030	6226	6424	6624	6830	7040
HT Industries	21116	22048	23012	24010	25042	26108	27201	28337	29508
Railway Traction	538	556	575	595	618	642	666	691	717
Bulk Supply	5184	5465	5753	6049	6351	6657	6965	7273	7580
NCR- Total (Energy Consumption) - (MU)	98066	102751	107568	112519	117599	122805	128013	133426	138964
NCR- T&D losses (MU)	13863	14096	14321	14630	14935	15236	15476	15718	15952
T&D losses-in %	12.39	12.06	11.75	11.51	11.27	11.04	10.79	10.54	10.3
NCR Energy Requirement (MU)	111929	116847	121889	127149	132534	138041	143490	149144	154916
Annual Load Factor - %	69.15	68	66.88	65.77	64.68	63.61	62.55	61.51	60.49
NCR Peak Load – (MW)	18478	19615	20806	22070	23392	24775	26187	27678	29233

Source: Report on Nineteenth Electric Power Survey of India (Volume-II) (National Capital Region), CEA, Ministry of Power, Government of India

Table D-4.3.15: Comparison of NCR with NR & All India in 2018-19

Particulars	NCT Delhi	NCR	Northern Region (NR)	All India	NCR as % of NR	NCR as % of all India
Energy Requirement (MU)	32282	98271	377595	1267526	26.03	7.75
Peak Demand (MW)	7016	15430	61726	175528	25.00	8.79
Population	192,07,448	673,58,564	4186,65,806	13571,98,722	16.09	4.96
Area (in sq km)	1,483	55,083	10,10,616	32,87,240	5.45	1.68

Source: Report on Nineteenth Electric Power Survey of India (Volume-II) (National Capital Region), CEA, Ministry of Power, Government of India

Key Issues and Challenges related to Power & Energy Sector in NCR

1. Manufacturing sector's contribution to Economic Structure is immense and its base of functioning is poised to increase in future. This would require adoption of modern fuel sources for energy generation.
2. The financial stress that DISCOMS are in, has meant payment delays for developers, cancellation of auctions, and lack of enforcement of contracts -- this dampens investor confidence and developers' interest.



3. Though the Government of India is targeting of generating 40 gigawatts (GW) of power through solar rooftop projects by 2022, but till March 2019, only 1796.39 megawatt (MW) of grid-connected solar rooftop systems had been installed. Also, the preference has been for commercial and industrial installations – residential consumers, who hold immense potential, account for less than 20 per cent of the total installed capacity.
4. **Cyber Security** - NCR is hub of commercial activities and security of power supply is most important aspect of this. As power is a part of Critical National Information infrastructure, cyber security of this sector is most important as its availability affect many other important sector like transport, health and security of strategic locations in NCR. NCIIPC, CERT-In and CERT-MOP are coordinating Cyber Security aspects of power sector. While Central Power Utilities and private DISCOMS in Delhi are prepared to an extent do deal with Cyber Security, other distribution and transmission companies in NCRs are not geared up. Even after lot of efforts by Ministry of Power these utilities have not prepared their Crisis management Plan (CMP) and not identified their Critical Infrastructure (CII). There are incidents wherein their public or billing portals are victims of Cyber-attack.
5. **Electric Vehicles (EVs)** - As per the National Electric Mobility Mission Plan 2020 of Department of Heavy industries, Government of India, the number of electric vehicles in India is likely to increase in a big fold (National target to bring 6 to 7 million EVs on roads by 2020 and to achieve 30% e-mobility by 2030). The growth rate of 7% in commercial category during the period 2016-17 to 2021-22, includes electricity demand of e-rickshaw, two wheelers, cars etc. was expected, however, if all the electric vehicle as projected in the National Electric Mobility Mission Plan materialize, the additional electrical energy requirement would be of the order of 8-9 BUs on all-India basis. Assuming 50% of the electric vehicles will charge simultaneously, the additional electricity demand would be of the order of 10,000 MW. The electric vehicles are likely to charge their batteries during day time i.e. during periods of high solar power, and thermal power stations during such time could be operated at lower capacity.
6. **Automatic Demand Side Management (ADSM)**, Energy Conservation & Efficiency Improvement programmes: - ADSM has been fully implemented by TPDDL in Delhi and is under implementation in Rajasthan (LoA placed on 12.12.2018 with an execution period of 18 months for ADMS at the level of 33kV feeders at EHV Substation of RVPN under SCADA / EMS part of project). In U.P. remote operation of 132 kV feeders under ADMS is operational with some issues prevail for the down below network which needs to be taken up with the DISCOMs. Haryana has not implemented ADMS scheme so far.
7. The smart grid provides an opportunity for energy companies to make power delivery more efficient, whether by minimizing the visits of personnel to transmission and distribution locations or by enabling better decisions through timely information. Automation is the key to development of smart grid. The implementation of automation and smart grid initiatives have been taken up by the DISCOMs of Delhi at a larger scale through installation of ring main units automatic sectionalizer and installation of unmanned grid sub stations. Metering infrastructure has also been created by installation of static meters. Other DISCOMs of the NCR region have also taken initiatives under integrated power development scheme. The cities of Faridabad and Karnal of Haryana, Ghaziabad of Uttar Pradesh and New Delhi Municipal Council (Delhi) are covered under smart city proposals. Such initiatives shall be further extended for achieving 'Smart NCR'.
8. **Planned Inter State (ISTS) network in NCR Area** - The power evacuation systems for Inter State Generating Stations (ISGS) is finalised by Central Transmission Utility (CTU), Power Grid Corporation of India Limited (POWERGRID), Ministry of Power. Further, for State Sector generation projects power evacuation system is to be planned and implemented by respective State Transmission Utilities (STUs).



Annexure-D-4.3.1

STATUS OF POWER GENERATION, TRANSMISSION, DISTRIBUTION, RENEWABLE ENERGY

1. **Generation:** The total generation capacity of Power in NCR is 9,496 MW (<10 GW); of coal- based thermal power generation is 5,560 MW (58.5%), Gas based generation is 3,480 MW(37%) and generation capacity from Other sources is 456 MW(0.5%). Refer **Figure D-4.3.1.1** providing various Central/ State/ Private Sector Power Projects for Power Allocation to Northern Region and NCR States. **Table D-4.3.1.2** gives list of such power projects for Northern Region; **Table D-4.3.1.3** gives list of such projects for NCR Region while **Table D-4.3.1.4** gives list for under construction power projects likely to benefit NCR States.

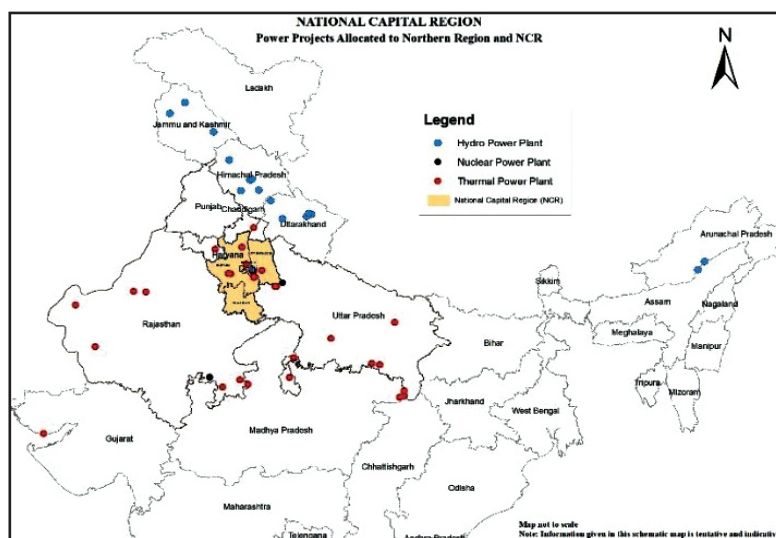


Figure D-4.3.1.1: Power Projects Allocated to Northern Region and NCR

2. **Transmission:** Northern region is very well connected with the Western Region and Eastern/North-Eastern Region through various high capacity AC and HVDC corridors. Surplus power available in NER/ER & WR can be transferred to NR through these corridors. Various Sub-Stations (S/Ss) located in the NCR area also have enough adequate capacity. Therefore, from transmission point of view, prima-facie there are no constraints envisaged in NCR in the near future by 2022 (refer **Figure D-4.3.1.2** for Power Network of NCR).
3. **Distribution:** Distribution Sector is considered the weakest link in entire power sector. T&D losses in the NCR constituent states are quite high (refer **Table D-4.3.10** of **Annexure-D-4.3**). Many distribution pockets of low voltage (430V) in towns are surrounded by higher voltage feeders, this coupled with low efficiency transformers are responsible for significant part of network losses. Theft of electric power and Tampering of line and thefts are rampant in case of LT lines in many parts of the settlements in the region. Hence despite adequate power generation and comfortable transmission network, distribution losses result in loss of revenue, and affect power quality, resulting in low voltage and dips in voltage.
4. **Automatic Demand Side Management (ADSM):** Delhi DISCOMs have undertaken large scale implementation of automation and smart grid initiatives through installation of ring main units automatic sectionalized, installation of unmanned grid sub stations. , installation of static meters and a 10 MW battery storage, which can feed around 2500 preferred customers. ADSM has been fully implemented by TPDDL in Delhi and is under implementation in Rajasthan. In U.P, remote operation of 132 kV feeders under ADSM is operational while some issues exist for the subordinate network. Haryana has not implemented ADSM scheme so far.
5. **Power for All (PFA) Initiative-** Government of India had taken a joint initiative with respective State Governments/ UT's for preparation of State specific documents for providing 24x7 Power to all households/homes, industrial and commercial consumers and adequate supply of power to agricultural consumers as per their policy. This initiative aimed at ensuring uninterrupted supply of quality power to existing consumers and providing access to electricity to all un-connected consumers by the year 2019 in a phased manner. This initiative has resulted in higher growth of electrical energy requirement in the initial years of the forecast period.
6. **Planned Inter State (ISTS) network in NCR Area -** The power evacuation systems for Inter State Generating Stations (ISGS) is finalised by Central Transmission Utility (CTU): Power Grid Corporation of India Limited



(POWERGRID), Ministry of Power. Further, for State Sector generation projects power evacuation system is to be planned and implemented by respective State Transmission Utilities (STUs).

7. Major initiatives towards having adequate fuel availability for electricity generation especially with regard to coal and gas to the Power Plants, are as follows: Coal India Limited (CIL) sign in Fuel Supply Agreements (FSAs) with power plants that have entered into long term Power Purchase Agreement (PPAs) with DISCOMs; Coal companies are being requested to increase the coal production so as to meet the demand of power plants; Even the imported coal based power plants are advised to reduce imports and use domestic coal; Captive coal blocks have been allocated by Ministry of Coal to augment coal availability for power projects and Suitable policy measures being taken to make natural gas available for power sector. To handle the frequent Right of Way (RoW) issues in construction of transmission lines, Ministry of Power (MoP) guidelines should be followed. At per MoP order dated 15.10.2015, 85% of circle rate can be given to land owner for tower area and also 15% of circle rate for RoW for transmission lines. Online RoW permissions facilities be started by each NCR State.

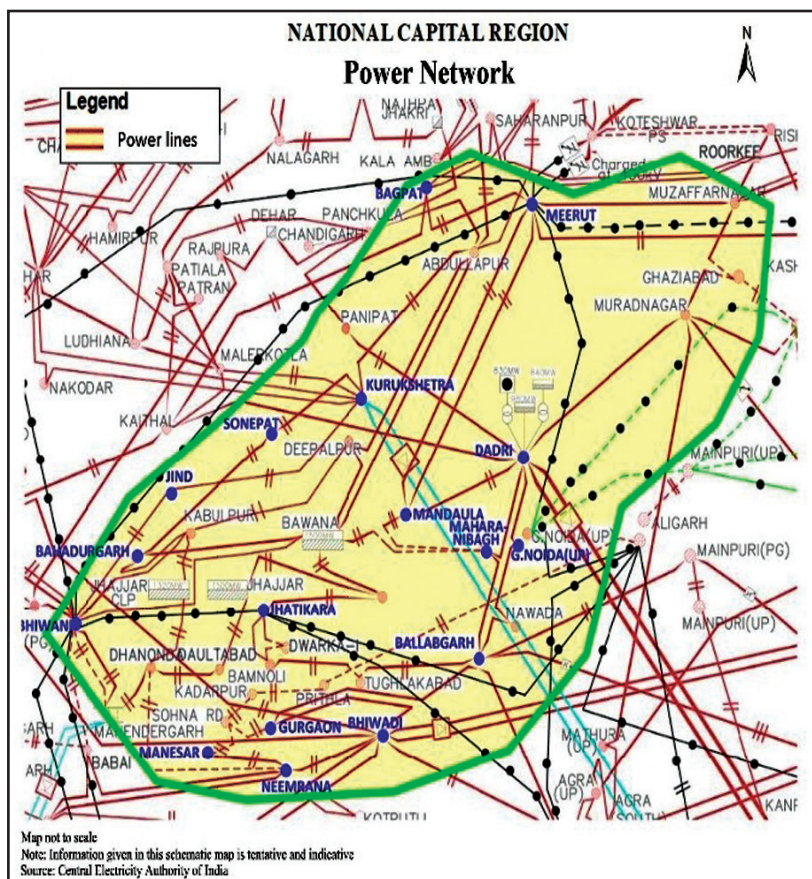


Figure D-4.3.1.2: Power Transmission Network of NCR, 2019 (Source : CEA)

8. Planned Inter State transmission system (ISTS) network in NCR Area - The power evacuation systems for Inter State Generating Stations (ISGS) is finalised by Central Transmission Utility (CTU), Power Grid Corporation of India Limited (POWERGRID), Ministry of Power.
9. **Cost comparison between overhead, underground and aerial bunched cables (refer Table D-4.3.1.1)**
Attaining 100% underground cabling would result in reduction of damage caused by severe weather conditions such as lightning, cyclones and power theft, thereby reducing aggregate technical and commercial (AT&C) losses. Initially overhead cables may be cheaper in laying cost; however, underground cables will help in network expansion in densely populated areas across NCR. It will also add to the aesthetics of the areas, as it does not obstruct the view.

Table D-4.3.1.1- Cost comparison between overhead, underground and aerial bunched cables

Cost comparison between overhead, underground and aerial bunched cables			
Voltage level	Tentative estimated cost per km (Rs million)		
	Overhead cables	Underground cables	Aerial bunched cables
LT	0.35	1.3	0.80
11 kV	0.50	2.0	1.35
33 kV	1.20	3.5	—
66 kV	4.50	8.0	—

Source: Central Electricity Authority



Central/State/Private Sector Power Projects for Power Allocation to Northern Region &NCR States

Table D-4.3.1.2: Central Sector Power projects /UMPPs involving Power Allocation to Northern Region states during 12th Plan and beyond (as on 15.05.2019)

Project name	State	Developer	Fuel Type	Capacity (MW)	Share of NR	Remarks	Year of Commissioned
1. Kameng HEP	Arunachal Pradesh	NEEPCO	Hydro	600	150	UC	-
2. Subansiri Lower HEP	Arunachal Pradesh	NHPC	Hydro	2000	-	UC	-
3. Parbati-II HEP	Himachal Pradesh	NHPC	Hydro	800	800	UC	-
4. Rampur HEP	Himachal Pradesh	STU	Hydro	412	412	Commissioned	2014
5. Kol Dam HEP	Himachal Pradesh	NTPC	Hydro	800	800	Commissioned	2015
6. Chamara-III HEP	Himachal Pradesh	NHPC	Hydro	231	231	Commissioned	2012
7. Parbati III HEP	Himachal Pradesh	NHPC	Hydro	520	520	Commissioned	2014
8. Kishan Ganga HEP	J & K	NHPC	Hydro	330	330	Commissnd.	2018
9. Uri II HEP	J & K	NHPC	Hydro	240	240	Commissd.	2013 & 2014
10. Tapovan Vishnugad HEP	Uttarakhand	NTPC	Hydro	520	520	UC	-
11. Tehri PSP	Uttarakhand	THDC	Hydro	1000	1000	UC	-
12. Indira Gandhi TPP (Jhajjar)JV U-3	Haryana	NTPC	Coal	500	500	Commissioned	2012
13. Rihand TPP-III U-5,6	Uttar Pradesh	NTPC	Coal	1000	1000	Commissioned	2012 & 2013
14. Mundra UMPP U 2-5	Gujarat	Tata Power	Coal	3200	1495	Commissioned	2012 & 2013
15. Sasan UMPP U 1-6	Madhya Pradesh	Reliance Power	Coal	3960	2326.5	Commissioned	2013, 2014 & 2015
16. RAPP U 7 & 8	Rajasthan	NPCIL	Nuclear	1400	1400	UC	-
17. Meja STPP U-1&2	Uttar Pradesh	JV of TPC, UPRVUNL	Coal	1320	1320	UC	-
18. Tanda TPS-II U-1&2	Uttar Pradesh	NTPC	Coal	1320	1320	UC	-
19. Ghatampur TPP U-1 to 3	Uttar Pradesh	NLC	Coal	1980	1980	UC	-
20. Barsingsar TPP Ext U-1	Rajasthan	NLC	Coal	250	250	UC	-
21. Bithnok TPP U-1	Rajasthan	NLC	Coal	250	250	UC	-
22. Vishnugarh Pipalkoti	Uttarakhand	THDC	Hydro	444	444	UC	-
23. Naitwar Mori	Uttarakhand	SJVNL	Hydro	60	60	UC	-
24. Pakal Dul	J & K	CVPPL	Hydro	1000	1000	UC	-
25. Lata Tapovan	Uttarakhand	NTPC	Hydro	171	171	UC	-

*UC: Under Construction

Source: CEA, Power sector Review Report for RP-2021

Table D-4.3.1.3: Central Sector / State Sector / Private Sector Power Projects for Power Allocation to NCR States during 12th Plan and beyond (as on 15.05.2019)

Project name	State	Developer	Sector	Fuel Type	Capacity (MW)	Remarks	Year of Commissioned
Pragati-III Bawana) CCGT (GT 3,4 + ST 2)	Delhi	PPCL	State	Gas/LNG	750	Commissioned	2012, 2013 & 2014
Mahatma Gandhi Jhajjar TPP U-2	Haryana	China Light Power	Private	Coal	660	Commissioned	2012
Kalisindh TPP U-1,2	Rajasthan	RRVUNL	State	Coal	1200	Commissioned	2014 & 2015
Chhabra TPP Ext U-3,4	Rajasthan	RRVUNL	State	Coal	500	Commissioned	2013 & 2014
Ramgarh CCGT	Rajasthan	RRVUNL	State	Gas	160	Commissioned	2013 & 2014
Jalipa Kapurdi TPP U 5-8	Rajasthan	Raj West Power	Private	Lignite	540	Commissioned	2013
Kawai TPP U 1,2	Rajasthan	Adani Power	Private	Coal	1320	Commissioned	2013



Project name	State	Developer	Sector	Fuel Type	Capacity (MW)	Remarks	Year of Commissioned
Anpara D TPP U 1,2	Uttar Pradesh	UPRVUNL	State	Coal	1000	Commissioned	2015 & 2016
Parichha TPP Extn U-5,6	Uttar Pradesh	UPRVUNL	State	Coal	500	Commissioned	2012 & 2013
Harduaganj TPP Ext U-9	Uttar Pradesh	UPRVUNL	State	Coal	250	Commissioned	2012
Bara (Prayagraj) TPP U 1-3	Uttar Pradesh	Prayagraj Power Gen. Co. Ltd.	Private	Coal	1980	Commissioned	2015, 2016 & 2017
Lalitpur TPP U1-3	Uttar Pradesh	Bajaj Energy	Private	Coal	1980	Commissioned	2016
RAPP U 7 & 8	Rajasthan	NPCIL	Central	Nuclear	1400	under construction	-
Meja STPP U-1&2	Uttar Pradesh	JV of NTPC & UPRVUNL	Central	Coal	1320	under construction	-
Vishnugarh Pipalkoti	Uttarakhand	THDC	Central	Hydro	444	under construction	-
Kishan Ganga HEP	J & K	NHPC	Central	Hydro	330	Commissioned	2018
Parbati-II HEP	Himachal Pradesh	NHPC	Central	Hydro	800	under construction	-
Kameng HEP	Arunachal Pradesh	NEEPCO	Central	Hydro	600	under construction	-
Tapovan Vishnugad HEP	Uttarakhand	NTPC	Central	Hydro	520	under construction	-
Tehri PSP	Uttarakhand	THDC	Central	Hydro	1000	under construction	-

Source: CEA, Power sector Review Report for RP-2021

Table D-4.3.1.4: Under construction power projects likely to benefit NCR (states) (as on 15.05.2019)

Project Name	Implementing Agency	State	Fuel Type	Sector	Unit No	No. of Units x MW	Cap. (MW)
1. Barsingsar TPP ext	NLC	Rajasthan	Coal	Central	U-1	1 x 250	250
2. Bithnok TPP	NLC	Rajasthan	Coal	Central	U-1	1 x 250	250
3. Ghatampur TPP	NLC JV	Uttar Pradesh	Coal	Central	U-1 to U-3	3 x 660	1980
4. Meja STPP	JV of NTPC & Uprvunl	Uttar Pradesh	Coal	Central	U-2	1x 660	660
5. Tanda TPP	NTPC	Uttar Pradesh	Coal	Central	U-1 to U-2	2 x 660	1320
6. Suratgarh TPS	RRVUNL	Rajasthan	Coal	State	U-7 to U-8	2 x 660	1320
7. Harduaganj Exp.-II TPP	UPRVUNL	Uttar Pradesh	Coal	State	U-1	1 x 660	660
8. Jawaharpur STPP	UPRVUNL	Uttar Pradesh	Coal	State	U-1 to U-2	2 x 660	1320
9. Obra-C STPP	UPRVUNL	Uttar Pradesh	Coal	State	U-1 to U-2	2 x 660	1320
10. Panki	UPRVUNL	Uttar Pradesh	Coal	State	U-1	1X660	660
11. Suratgarh TPS/Rrvunl		Rajasthan	Coal	State		2 x 660	1320
12. Rajasthan Atomic Power Station (RAPP)	NPCIL	Rajasthan	Nuclear	Central	U-7 & U-8	2x700	1400
13. Parbati St. II	NHPC	Himachal Pradesh	Hydro	Central	--	4x200	800
14. Tapovan Vishnugad	NTPC	Uttarakhand	Hydro	Central	--	4x130	520
15. Tehri PSS	THDC	Uttarakhand	Hydro	Central	--	4x250	1,000
16. Vishnugad Pipalkoti	THDC	Uttarakhand	Hydro	Central	--	4x111	444
17. Subansiri		Arunachal Pradesh	Hydro	Central	--	8X250	2000
18. Natwarmori		Uttarakhand	Hydro	Central	--	2X30	60
19. Lata Tapovan*		Uttarakhand	Hydro	Central	--	3X57	171
20. Kameng	NEEPCO	Arunachal Pradesh	Hydro	Central	--	4x150	600
Total							18055

*Subject to start of work

Source: CEA, Power sector Review Report for RP-2021



10. RENEWABLE ENERGY IN NCR:

- 10.1 Though solar policies are formulated, limited installation/ application of solar energy (solar rooftop) is a reality. Gurugram has reached a total installed capacity of 25MW of solar power. NCT Delhi has set the target as 1000 MW in its solar policy, including at various government departments, as well as in the domestic and social sectors in coming years and actual achievement till March, 2019 was 128 MW.
- 10.2 The renewable purchase obligations as decided by Ministry of Power, Government of India vide OM dated 14th June, 2018 for various utilities are given in **Table D-4.3.1.5** The proposed targets by MNRE 2022 for different categories of RE like solar, wind, small hydro power and bio mass power are given in **Table D-4.3.1.6**.

Table D-4.3.1.5: National Renewable Purchase Obligations (RPO)

Long term RPO Trajectory	2019-20	2020-21	2021-22
Non-Solar	10.25%	10.25%	10.50%
Solar	07.25 %	08.75%	10.50%
Total	17.50%	19.00%	21.00%

Source: Review Report of Power Sector of RP-2021

Table D-4.3.1.6: Proposed targets for NCR States & Northern Region as per the Ministry of MNRE -2022

State/Uts	Solar Power (MW)	Wind (MW)	SHP (MW)	Biomass Power (MW)
Delhi	2,762			
Haryana	4,142		25	209
Himachal Pradesh	776		1,500	
Jammu and Kashmir	1,155		150	
Punjab	4,772		50	244
Rajasthan	5,762	8,600		
Uttar Pradesh	10,697		25	3,499
Uttarakhand	900		700	197
Chandigarh	153			
Northern Region	31,120	8,600	2,450	4,149

Source: NITI Aayog Report - <https://niti.gov.in/writereaddata/files/175-GW-Renewable-Energy.pdf>

10.3 Solar Sector

- i) NCR area has a **huge potential for tapping solar energy** either through PV (Photovoltaic) using the free space on rooftop or ground mounted solar. PV system or through CST (Concentrated Solar Thermal), which can help in cutting down the load demand from grid, saving on T&D infrastructure. The cost of solar power has shown decreasing trend during past few years and possibility of large scale solar application in the long run in the country would further bring down the cost of generation of solar electricity. Delhi PWD has already installed Grid Interactive Solar Power Generation (1 MWp) at Tyagraja Indoor Stadium with state-of-art facility.
- ii) Regarding promotion of Renewable Energy in the NCR Area:
- NCT of Delhi in its Solar policy set the target for 2020 as 1000 MW however, actual achievement till March, 2019 was 128 MW.
 - RPO Obligation: For non-solar it is 10.50% by 2021-22, and for solar also it is 10.50% by 2021-22.
 - Present compliance of Delhi is 3%. Delhi DISCOMs are entering into Long term and short term power contracts to fulfill this requirement
 - Rajasthan would be able to meet this as it has wind and solar capacity
 - UP & Haryana need to meet it through procurement of renewable power or purchase of Renewable Energy Certificates (RECs).

Source: Economic Survey of Delhi 2017-2018 and <https://www.ibef.org/industry/power-sector-india.aspx>



Annexure-D-4.4

HIGHLIGHTS OF CIRCULAR ECONOMY IN INDIA

1. As per the Report FICCI³⁷, Circular Economy, through its innovative business models, offers a unique window of opportunity to decouple growth from resource requirements. At the core of Circular Economy lays a shift towards complete elimination of waste – i.e. waste not in the traditional sense of junk, but any kind of underutilization of assets and resources. Organizations can adopt five distinct models to introduce circular initiatives in their operations: (i) Circular Supply Chain, (ii) Recovery & Recycling, (iii) Product Life Extension, (iv) Sharing platform, & (v) product as a service
2. As per FICCI analysis, approximately half-a-trillion dollars' worth of economic value that can be unlocked through Circular Economy business models in India by 2030. The enormous circular opportunity in India will manifest itself in the form of different resources. From prioritization perspective, resources with significant economic impact and environmental footprint are the natural choices for organizations to focus their CE initiatives.
3. FICCI research highlights eight such priority resources for India. These are: (i) petrochemicals, (ii) plastics, (iii) food, (iv) gold, (v) iron & steel, (vi) copper, (vii) Fibers, and (viii) cement. It is noteworthy that there is no standard model that applies across all industries and the opportunities exist in diverse forms. For instance: Urban mining from e-waste: There is US\$1bn of value that can be realized from the extraction of gold from e-waste in India. Plastics recycling: Currently, ~40% of plastic waste in India ends up being uncollected for recycling. Proper management of this waste can create ~14 lakhs jobs and could potentially represent a ~US\$2bn opportunity. Steel recovery from end of life vehicles: There is over 8mn tons of steel that can be potentially extracted from end of life vehicles in India in 2025, representing a ~US\$2.7bn opportunity.
4. Further, a report on *Circular Economy in India*³⁸: *Rethinking growth for long-term prosperity* shows that a circular economy path to development could bring India annual benefits of ₹40 lakh crore (US\$ 624 billion) in 2050 compared with the current development path – a benefit equivalent to 30% of India's current GDP. This conclusion rests on high-level economic analysis of three focus areas key to the Indian economy and society: cities and construction, food and agriculture, and mobility and vehicle manufacturing. The research shows that realising these benefits fully would require applying circular economy principles in combination with harnessing the unfolding digital and technological transformation, all tailored to the Indian context. It reveals that by launching new circular economy initiatives and reinforcing existing efforts, India could leverage its expected high levels of growth and development to build a more resource-effective system, creating value for businesses, the environment, and the Indian population. Benefits of Circular Economy are given at **Figure-D-4.4.1**.



Figure-D-4.4.1 Benefits of Circular Economy

Source: UNCTD ^{5ht}<https://unctad.org/topic/trade-and-environment/circular-economy>

³⁷Accelerating India's Circular Economy Shift, 2018 <http://www.ficci.in/pdf/FICCI-Accenture_Circular%20Economy%20Report_OptVer.pdf>

³⁸Circular Economy in India - https://smartnet.niua.org/sites/default/files/resources/circular-economy-in-india_5-dec_2016_0.pdf



Annexure-D-4.4.1

WASTE PAPER SCENARIO IN INDIA

1. About 421 million tons of paper and paperboard is produced globally and India produces around 5.7% of the total world's paper and paperboard production. The industry sources indicate that about 22.6 million tons of paper and paperboard is produced by Indian mills from about 706 paper mills, out of which about 550 mills are operational at present. The Indian paper industry utilizes three main raw materials viz., wood, agro residues and waste paper or recycled fiber (RCF).
2. The major share in production is from recycled fiber based mills. There are around 716 waste paper based mills out of which about 514 mills are operational and produce about 80.9% of the total production. Rest 19.1% is produced by 16 wood based and 20 agro based mills.
3. Over the last three decades there has been a drastic increase in utilization of waste paper for production of paper and paperboard. The increase in share of the waste paper based mills over a period of 30 years has been from 32% in 1990 to 80.9% in 2019-20. Reasons of decline in wood/agro base paper production are scarcity of wood and agro based raw material in the country for enhancement of the production capacities to meet the growing demand, environmental problems and strict Government norms.
4. **Table D-4.4.1.1** depicts the production and raw material requirement by different segments of the industry based on wood, agro residues and RCF.

Table D-4.4.1.1: Raw Material needs for different types of paper mills

Type of mill	Production (No of mills)	Raw material requirement (Oven Dried)
Wood based	2.5 million tonne (16)	6.5 million tonne wood
Agro based writing	1.6 million tonne (20)	5.6 million tonne agro residues
Agro based Kraft	0.5 million tonne (8)	0.8 million tonne agro residues
Waste paper based	18 million tonne (approx. 716)	Approx 20 million tonne recycled fiber (waste paper)

5. **Import-export scenario of waste paper and pulp derived from waste paper**
 - 5.1 All items covered under Chapter 47 (all HS Codes under 4701, 4702, 4703, 4704, 4705, 4706 and 4707) are input raw material for the pulp and paper sector.
 - 5.2 India is a fibre deficient country. As per present policy, no forest produce of wood can be lumbered for use in paper making. It has to rely on imports of items under chapter 47 to provide adequate and reliable supply of cellulosic fibre as well as waste paper. To overcome this shortage of fibre, the Indian paper industry has to resort to import of raw material for its use viz. pulps and waste paper.
 - 5.3 Details of imports of waste paper (HS code 4707) in India are in **Table D-4.4.1.2**. These figures of rising imports is an indication that the country is not able to meet its demand of waste paper through its domestic availability.

Table D-4.4.1.2: Import of waste paper in India 2014 to 2019

Year	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20 (Apr-Jan)
Import (million tons)	3.08	3.12	3.20	4.01	6.38	5.68

- 5.4 Over 80% of the production of paper is coming from waste paper based mills. Since the domestic collection of post-consumer waste paper is very low (35-40%), a sizable amount of waste paper is currently being imported. Details of total paper production from waste paper and import of waste paper is given in **Table 4.4.1.3**.



Table D-4.4.1.3: Total Paper Production & Import of waste paper in India 2014 to 2019

Year	Total Paper production (million tons)	Production from wastepaper-based mills (million tons)	Import of wastepaper (Million tons)
2014-15	17.03	11.60	3.08
2015-16	17.33	12.50	3.12
2016-17	17.37	12.03	3.20
2017-18	18.91	13.03	4.01
2018-19	19.30	13.50	6.38

- 5.5 On an average about 85% yield is obtained from recovered paper. Thus, for 2018-19, if 6.38 million tons of waste paper was imported, then nearly 5.4 million tons of paper is made out of this imported waste paper. This in turn means that $13.50 - 5.4 = 8.1$ million tons of paper is made out of indigenous waste paper. Clearly, any export of waste paper from the country will result in a severe crisis of raw material for the paper sector which shall adversely affect 70% of the total paper production of the country. Export figures of HS code 4706 (pulp from recovered paper) and HS code 4707 (recovered paper) are provided in **Table D-4.4.1.4** and **D-4.4.1.5**.

Table D-4.4.1.4: Export figures of HS code 4706 (pulp from recovered paper).

Year	2015-16	2016-17	2017-18	2018-19	2019-20
QTY (inTons)	1435	2144	1275	5101	23636

It may be mentioned here that as per the existing policy, export under the head ITC -HS 4706 is classified as “FREE”. It can be observed that in the year 2019-20 the exports shot up by 4.6 times.

Table D-4.4.1.5: Export figures of HS code 4707 (recovered paper):

Year	2015-16	2016-17	2017-18	2018-19	2019-20
QTY(in Tons)	142.79	294.23	298.65	575.51	819.59

It can be seen that there is increasing trend in export under ITC-HS 4707 category also. The exports under this ITC -HS Code is under “Restricted” category.

- 5.7 Under India’s current Export Policy, export of wood pulp (all HS Codes under 4701, 4702, 4703, 4704 and 4705) is prohibited. All these are pulps of various kinds. However, the export of pulp made from waste paper is freely allowed. This provides a pathway of export of scarce raw material from the country, which is actually being imported in the first place. Likewise export of waste paper (all HS Codes under 4707) is restricted and only allowed under license. This is a substrate from which items classified under 4706 are made. To increase indigenous availability of recovered paper and its pulp, there is a need to prohibit the export of these raw materials/ intermediate raw material for the manufacture of paper.

6. Waste Paper Demand and Its Source

For production of 18 million tons of paper and paperboard from recycled fiber, approx 20 million tons of raw material is required. Out of this about 6.38 million tons is imported waste paper and rest 13.62 million tons indigenous waste is utilized for paper production. Mills also use their internal wastages in production (approx. 15-20% of total raw material usage). As such, about 10 million tons waste paper is sourced from indigenous waste paper collection system to the mills. To collect 10 million tons waste paper, approx 1 million people are getting employment across India. Approximately one person collects around 40 kg paper per day.

7. Problems/ Challenges in waste paper collection in India:

- 7.1 About 10 Million tons of paper is domestically collected. This amounts to 50% of the total waste paper quantities used by the paper industry. About 4.0 million tonnes is met by industry by taking into account about 15% -20% internal waste recycled in the industry from broke and finishing house losses.



- 7.2 Paper mills state level association members feel that Carton supplied to malls and corporate and B2B are collected to a tune of > 90 % and so is the collection of old newspapers and magazines. However, the collection of white/ printed paper is very low. Local wastepaper collectors and suppliers do not see such collection numbers. It is noted that there are over 7000 wastepaper suppliers in the country with no organised data collection centre. Recently they have formed association and it is likely that in future the real data may be available.
- 7.3 The waste paper collection system is in control of unorganized collectors and distributors. It can be improved and the system therefore needs support for re-orientation. The main reasons for this are;
- i. Waste paper collection is difficult and involves many stake holders.
 - ii. Large amount of waste paper is collected from household. Therefore there are many problems in its proper collection due to;
 - iii. Low quality due to mixing and improper handling is the major problem
 - iv. Proper storage systems are required during its segregation, cleaning and proper bailing for different type of waste papers/boards.
 - v. Soiling and wastage of the paper due to improper handling.
 - vi. Use for food/ fruits packing which is sometimes dangerous for health
 - vii. Waste paper is subjected to various unit operations during its conversion to value added paper products. During these operations it is treated with chemicals and mechanical harsh action. As a result fiber deterioration takes place and therefore recycled paper can not be recycled to produce high quality product after its multiple recycling. On an average it can be recycled 4 to 5 times for value addition. The shortening of fiber takes place due to multiple recycling and it is used for low grade paper production. A proper collection system, segregating the waste paper based on its grade and quality system can help the industry to produce high quality products from waste paper.
 - viii. Upgradation in paper collection, segregation and bailing system in India can provide various opportunities for the paper mills. Some of these are;
 - ix. Industry can make different grades/varieties easily from waste paper
 - x. It would help to produce paper in an environment friendly way, without much losses and use of excess chemicals and energy.
 - xi. Good quality raw material would also help in low investment in setting up Recycled fiber based paper mills by eliminating some unit operations / less cleaning requirements due to cleaned and segregated raw material.
 - xii. This would result in less use of water, chemicals, steam, Electricity, higher yield and production of large number of varieties by the mills.

8. Suggested measures

- 8.1 To develop the authentic data base on waste paper collection and utilization.
- 8.2 Waste separation by all stakeholders at source should be made mandatory.
- 8.3 The unorganised paper collection system needs to be organised.
- 8.4 There is need to demonstrate the model collection, segregation, cleaning, quality assessment and bailing system in India. The pilot demonstration project should be started at the earliest.
- 8.5 The demo projects may be started in Delhi NCR and Chennai metropolitan area. Later these may be replicated in various other parts of the country.
- 8.6 Export of all items covered under HS codes 4706 (pulp from recovered paper) and 4707 (recovered paper) should be placed under prohibited category.



Annexure-D-4.5

LIST OF SCIENTIFIC RESEARCH INSTITUTIONS (SRIS) / R&D HUBS IN NCR**Table D-4.5.1: List of Scientific Research Institutions (SRIs) / R&D Hubs in NCR**

Number of Institutes		
Sl. No	Areas of Research	Total
I.	Agricultural Sciences	10
II.	Biological and Medical Sciences	14
III.	Physical Sciences and Mathematics	05
IV.	Earth Sciences	02
V.	Engineering Sciences	04
VI.	Multi-disciplinary and Other Areas	05
	Total	40

Sl. No.	Name of Institution
I	Agricultural Sciences
I.1	Indian Agricultural Research Institute (IARI), New Delhi (www.iari.res.in)
I.2	National Dairy Research Institute, Karnal, Haryana (www.ndri.res.in)
I.3	National Bureau of Plant Genetic Resources (NBPGR), New Delhi (www.nbpgr.ernet.in)
I.4	Central Soil Salinity Research Institute, Karnal, Haryana (cssri.nic.in)
I.5	National Centre for Integrated Pest Management (ICAR), Delhi (www.ncipm.org.in/)
I.6	National Research Center on Plant Biotechnology, Pusa Campus, New Delhi (www.nrcpb.org)
I.7	Department of Zoology, University of Delhi, Delhi (ww.du.ac.in)
I.8	National Institute of Plant Genome Research (NIPGR), New Delhi (http://www.nipgr.res.in/)
I.9	National Centre for Agricultural Economics and Policy Research (NCAP), New Delhi (http://www.ncap.res.in/)
I.10	Sri Venkateswara College, University of Delhi, New Delhi, (http://www.svc.ac.in/)
II	Biological and Medical Sciences
II.1	International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi (www.icgeb.org)
II.2	National Brain Research Centre, Manesar, Gurgaon (www.nbrc.ac.in)
II.3	National Centre for Disease Control, New Delhi, (www.ncdc.gov.in/)
II.4	National Institute of Immunology, New Delhi (www.nii.res.in/)
II.5	Institute of Genomics and Integrative Biology, New Delhi (www.igib.res.in/)
II.6	Jamia Hamdard University, New Delhi (www.jamiahamdard.edu)
II.7	School of Life Sciences, Jawaharlal Nehru University, New Delhi (http://www.jnu.ac.in/sls/)
II.8	Centre for Chronic Disease Control (CCDC), Gurgaon, Haryana, (http://www.ccdcindia.org)
II.9	School of Biotechnology, Jawaharlal Nehru University, New Delhi (http://www.jnu.ac.in/SBT)
II.10	Special Centre for Molecular Medicine, Jawaharlal Nehru University, New Delhi (http://www.jnu.ac.in/SCMM/)
II.11	School of Computational and Integrative Sciences (SC&IS), Jawaharlal Nehru University, New Delhi (http://www.jnu.ac.in/)
II.12	Microbial Technology Lab, Acharya Narendra Dev College, New Delhi (http://andcollege.du.ac.in)
II.13	Department of Pharmaceutical Sciences, Maharshi Dayanand University, Rohtak, Haryana (www.mdurohtak.ac.in)
II.14	Jawaharlal Nehru University, New Delhi [www.jnu.ac.in/]
III	Physical and Mathematical Sciences
III.1	Inter-University Accelerator Centre (IUAC Delhi), Aruna Asaf Ali Marg New Delhi 110067 (www.iuac.res.in)
III.2	National Physical Laboratory, New Delhi (www.nplindia.org)
III.3	National Institute of Medical Statistics, Delhi, (http://www.icmr.nic.in/000134/irms.htm)
III.4	School of Physical Sciences, Jawaharlal Nehru University, New Delhi (http://www.jnu.ac.in/SPS/)



Sl. No.	Name of Institution
III.5	National Institute of Solar Energy (NISE), Ministry of New and Renewable Energy, New Delhi/Gurgaon (http://www.mnre.gov.in/)
IV	Earth Sciences
IV.1	Centre For Advanced Study, Department of Geology, University of Delhi, Delhi (www.du.ac.in)
IV.2	The Energy and Resources Institute (TERI), New Delhi (http://www.teriin.org/ESCC)
V	Engineering Sciences
V.1	Central Road Research Institute, New Delhi (www.crridom.gov.in/)
V.2	Indian Institute of Technology, New Delhi (http://www.iitd.ac.in/)
V.3	National Council of Cement and Building Materials, Ballabgarh, Haryana (http://www.ncbindia.com)
V.4	School of Computer & Systems Sciences, Jawaharlal Nehru University, New Delhi (www.jnu.ac.in/SCSS/default.htm)
VI	Multi-disciplinary and Other Areas
VI.1	National Institute of Science Technology and Development Studies, New Delhi (www.nistads.res.in)
VI.2	School of International Studies, Jawaharlal Nehru University, New Delhi (http://www.jnu.ac.in/SIS)
VI.3	Centre for Studies in Science Policy, School of Social Sciences, Jawaharlal Nehru University, New Delhi (http://www.jnu.ac.in/SSS/CSSP/)
VI.4	Centre for International Trade in Technology (C.I.T.T.), Indian Institute of Foreign Trade (IIFT), New Delhi (http://cc.iift.ac.in/docs/iift/citt.asp)
VI.5	Institute for Studies in Industrial Development, New Delhi (http://www.isid.org.in/home.html)

Source: DST List-of-Indian-institutions³⁹

³⁹<http://dst.gov.in/sites/default/files/ANNEXURE-I%20List-of-Indian-institutions.pdf>



Annexure-D-5.1

5. TRANSPORT AND MOBILITY

Table D-5.1.1 Station-wise yearly passenger footfall (Year: 2017-20)

Station	Total Passenger footfall (in thousands)			Station	Total Passenger footfall (in thousands)		
	17-18	18-19	19-20		17-18	18-19	19-20
NDLS	78000	78000	210000	ANDI	617	521	432
TKJ	1473	1350	1170	LPNR	41	47	37
DLI	43000	43000	140000	DSJ	36	35	34
DSA	6883	5879	5388	BRSQ	9	4	2
NZM	32000	33000	69000	DEE	12000	12000	18000
ANVT	22000	26000	38000	PTNR	709	661	577
OKA	1112	1014	842	DEC	3177	3016	2462
TKD	3698	3389	3147	DBSI	866	830	732
DKZ	1345	1256	1021	SSB	1755	1635	1479
SZM	1438	1332	1335	NNO	4453	4220	3940

Source: SPA, Delhi

Table D-5.1.2 Existing metro rail network

Sub Region	No. of Towns	No. of Stations	Length (kms)
NCT Delhi	10	211	291.026
Haryana	2	27	34.225
Uttar Pradesh	3	46	71.64
NCR	15	284	396.891

Source: NCR Monitoring and Planning Cell, Govt. of Delhi & Delhi Metro Rail Corporation Ltd. (DMRC), Govt.

Table D-5.1.3 and Table D-5.1.4 present the details of existing rail network serving the NCR.

Table D-5.1.3: Existing rail network in the region (Other than NCT Delhi)

Sub Region	Type of Network	No. of Stations	Length (Kms)
Haryana	Broad Gauge	81	558.76
Uttar Pradesh	Broad/Meter Gauge	77	396.57
Rajasthan	Broad Gauge	42	485
NCR	Broad/Meter Gauge	200	1440.33

Source: Ministry of Railway; NCR Monitoring and Planning Cell, Govt. of Haryana, Govt. of Uttar Pradesh, and Govt. of Rajasthan

Table D-5.1.4: Existing Radials of NCR rail network

Radials Rail network	
Major Radials	New Delhi – Faridabad – Palwal (to and from Central India)
	New Delhi – Sonipat – Panipat (to and from Northern States)
	New Delhi – Rohtak (to and from parts of Haryana & Punjab)
	New Delhi – Gurgaon – Rewari – Alwar (to and from Western India)
	New Delhi – Shahdara – Shamli (to and from Western UP)
Radials	Delhi – Ghaziabad – Khurja – Aligarh (to and from Eastern India)
	Delhi – Ghaziabad – Hapur – Garhmukteswhwar (to and from UP and Utrakhand)
	Delhi – Ghaziabad – Meerut (to and from Western UP)



Other sub sections rail network in NCR and around NCT Delhi	
NCR	Khurja – Hapur – Meerut (connecting Delhi - Howrah route with Delhi - Meerut- Saharanpur and Delhi-Moradabad links)
	Panipat – Rohtak (Branch line)
	Sub sections of Rohtak – Jind, Rewari – Bhiwani, Rewari – Mahendragarh and Rewari – Narnaul sections.
NCT Delhi	Delhi – New Delhi – Nizamuddin – Patel Nagar – Delhi Kishanganj – New Delhi
	Delhi – Shahdara/Sahibabad – Anand Vihar- New Delhi

Table D-5.1.5 Existing Bus Terminals and Depots

SubRegion	NoofTerminals	NoofBusDepots	Vehicles capacity	Passengercapacity
NCTDelhi	9	58	5044	
Haryana	14	48	7800	324550
UttarPradesh	8	27	3946	193360
Rajasthan	2			
NCR	33	133	16790	517910

Source: Govt. of NCT Delhi, Govt. of Haryana, Govt. of Uttar Pradesh and Govt of Rajasthan

Table D-5.1.6 List of Stations of DMRC Phase-III planned for Multi-Modal integration.

Sl. No.	Stations	Sl. No.	Stations
1	Moti Bagh	31	Greater Kailash (GK Enclave)
2	South Campus (Dhaura Kuan)	32	IIT
3	BadliMor	33	Munirka
4	Punjabi Bagh	34	R.K. Puram
5	Shalimar Bagh	35	HauzKhas
6	Azadpur	36	Chirag Delhi
7	Majlis Park (Mukundpur)	37	Okhla Vihar
8	Badli	38	Panchsheel Park
9	Shakurpur	39	IGI Airport
10	ESI Hospital	40	Jasola Vihar
11	Netaji Subhash Place	41	Janpath
12	Vasant Vihar	42	Vinod Nagar West
13	Janakpuri West	43	Vinod Nagar East
14	Dabri Mor	44	Trilokpuri
15	Delhi Cantt.	45	Mayur Vihar Phase I
16	Naraina Vihar	46	I.P. Extension
17	Mayapuri	47	Mayur Vihar Pocket I
18	Rajouri Garden	48	Ishwar Nagar
19	Rohini Sector 18	49	Jamia Nagar
20	Palam	50	Karkardooma
21	Sarojini Nagar	51	Karkardooma Court
22	Bhikaji Cama Place	52	Krishna Nagar
23	Vinobapuri	53	East Azad Nagar
24	South Extension	54	Gokulpuri
25	INA	55	Shiv Vihar
26	Sadar Bazar	56	Johri Enclave
27	Shanker Vihar	57	Maujpur
28	Kalkaji Mandir	58	Jaffrabad
29	Okhla Phase-III (Okhla NSIC)	59	Welcome
30	Nehru Place (Nehru Enclave)	60	Delhi Gate

Source: DMRC



Table D-5.1.7 Movement Pattern of Traffic

MovementPattern	Passenger Modes	Goods Modes
Intra-NCR	70percent	40percent
BetweenHaryana-NCR	5percent	10percent
BetweenUP-NCR	7percent	14percent
BetweenrestofRajasthanandNCR	13percent	11percent
BetweenNCRandOtherStates	5percent	20percent
Throughmovements/non-destinedtraffic		5percent

Source: Functional Plan of NCR & related Study

Table D-5.1.8 Proposed locations of interchanges in NCR

Sl. No.	Locations	Between	Type
1	Kundli	KMP EW x Delhi Peripheral Expressway	Full
2	Kundli	KMP EW X Delhi Peripheral Regional Arterial (NH-1)	Partial
3	Bahadurgarh	KMP EW X Delhi-Rohtak EW	Full
4	Bahadurgarh	KMP EW X Delhi-Rohtak Regional Arterial (NH-10)	Partial
5	Farrukhpur	KMP EW X Jhajjar-Gurgaon CNCR Grid Arterial (NH)	Full
6	Manesar	KMP EW X Delhi-Gurgaon-Dharuhera EW	Partial
7	Taoru	KMP EW X Rewari-Taoru Expressway	Full
8	Taoru	KMP EW X Rewari-Palwal RA x Pataudi – Nuh RC/D	Partial
9	Palwal	KMP EW x Delhi Peripheral EW	Full
10	Ghori	KMP EX x Palwal-Khurja EW	Full
11	Gharora	PGK EW x Ballabgarh-Sikandarabad RA	Partial
12	Kondli	PGK EW x Yamuna EW	Full
13	Surajpur	PGK EW x Ganga Expressway	Full
14	Dadri	PGK EW x Ghaziabad-Dadri EW x Faridabad-Dadri-Hapur RC/D	Full
15	Dasna	PGK EW X Ghaziabad-Hapur EW	Full
16	Dasna	PGK EW X Ghaziabad-Hapur RA	Partial
17	Muradnagar	PGK EW x Ghaziabad-Meerut EW	Full
18	Muradnagar	PGK EW x Ghaziabad-Meerut RA (NH-58)	Partial
19	Baghpat	PGK EW x Loni-Baghpat EW	Full
20	Panipat	Delhi-Panipat EW x Panipat Bypass	Full
21	Panipat	Panipat-Rohtak EW x Panipat Bypass	Full
22	Rohtak	Rohtak Bypass x Rohtak-Panipat EW	Full
23	Rohtak	Rohtak Bypass x Rohtak-Delhi EW	Full
24	Rohtak	Rohtak Bypass x Rohtak-Jhajjar-Rewari EW	Full
25	Rewari	Rewari Bypass x Rewari –Rohtak EW	Full
26	Rewari	Rewari Bypass x Dharuhera-Taoru EW	Full
27	Rewari	Rewari Bypass x Dharuhera-Taoru EW	Full
28	Gurgaon	Delhi-Gurgaon-Dharuhera EW x Gurgaon-Faridabad EW	Full
29	Faridabad	Delhi-Faridabad-Palwal EW x Faridabad-Gurgaon EW	Full
30	Jewar	Yamuna EW x Palwal-Kheja EW	Full
31	Bulandshahr	Ganga EW x Khurja – Hapur-Meerut EW	Full
32	Hapur	Ghaziabad-Hapur EW x Khurja-Hapur-Meerut EW	Full
33	Meerut	Meerut Bypass x Meerut-Hapur EW	Full
34	Meerut	Meerut Bypass x Ghaziabad-Meerut EW	Full
35	Meerut	Meerut Bypass x Meerut-Baghpat EW	Full

Source: Study on Integrated Transportation Plan for NCR- as part of FP-2032



A. Analysis of Movement Pattern of Traffic

1. At the urban scale it was observed that Gurugram has the highest volume of entry and exit with 3,13,609 vehicles per day while Sonipat has the least with 20,625 vehicles per day.
2. In terms of movement pattern of passenger traffic 69.4 percent trips were Internal- Internal, 15.5 per cent Internal – External, 14 percent External- Internal and 1.2 percent External- External, respectively. For goods traffic of the total trips 39.9 percent of the trips were internal-internal, 27.6 percent internal-external, 27.4 percent external-internal and 5.1 percent external-external, respectively.
3. The passenger interaction between Rajasthan and NCR is the highest with 13 per cent share followed by Haryana and NCR with 5 percent and UP and NCR with 7 percent interaction, respectively. With respect to goods traffic interaction, UP-NCR have been found to have highest share of 14 percent followed by Rajasthan and NCR, respectively.
4. The travel characteristics of passenger vehicles indicate that the standard buses have a trip length of 191 km, car have a trip length of 125 km while the two-wheeler and three-wheeler have trip lengths of 13.99 km and 13.35 km, respectively. The travel characteristics of goods vehicles indicate that the Multi Axle Vehicle(MAV's) have a trip length of 685 km, 2/3 axle trucks 321 km, the LCV and tractor 154 km and 51 km, respectively.

B. Key Challenges in Logistics Sector

1. Infrastructure:

- i. Inadequate and low-quality modal and terminal transport infrastructure, limited availability of multi modal interchange points.
- ii. Inefficient and ill-designed storage facilities for cargo and containers.
- iii. Inefficient operational and maintenance protocols.
- iv. Poor adoption/adaptation of technology.

2. Regulatory Hurdles:

- i. Obstacles in land acquisition and consolidation
- ii. Obstacles in change in land use
- iii. Lack of transparency in compliances

3. Suboptimal Modal Mix in India:

Nearly 60 % of the cargo is moved by road, 32% by rail, and rest by the coastal shipping, airways and inland waterways. Pipelines constitute only a very minor proportion. Globally, it is accepted that movement of long haul bulk traffic by road is less efficient than by rail or coastal or waterways.

4. Tariff Structure:

- i. Cross-subsidy of passenger tariff by freight in railways leading to high freight cost of rail
- ii. Underdeveloped coastal transportation market leading to high and unstable tariffs
- iii. High vessel related charges on Indian ports

5. Various types of approval and licenses required for setting up of a Multi Modal Logistics Parks (MMLP), is also challenge for the logistics sector. These include (non-exhaustive) 5 for Rail Operation, 13 for DTA Warehouse (State government approvals), 13 nos. for ICD Operations and another 13 nos. for HR/Admin/ Safety security/ firefighting / pollution control, etc.

6. Skill Development:

Lack of skilled manpower in truck drivers, sea farmers, warehousing managers, quality inspection supervisors.



Annexure-D-5.1.1

DESIGN REQUIREMENTS OF WATER AERODROMES AND OTHER AERODROMES

A. Water Aerodromes:

Asia Pacific Regional Guidance on Requirements for The Design and Operations of Water Aerodromes for Seaplane Operations states the following:

1 Water Runway

- 1.1 Number and orientation of water runways: The number of water runways at a water aerodrome and their orientation should be such that, for a large percentage of time as practicable but for not less than 95 percent there is at least one water runway for which the surface wind velocity component at right angles to its longitudinal axis will not preclude the landing or taking off of seaplane that the water aerodrome is intended to serve.
- 1.2 Length of water runways: The length of the water runway to be provided should be adequate to meet the operational requirements of the critical seaplane for which the runway is intended and should be not less than the longest length determined by applying the corrections for local conditions to the operations and performance characteristics of the relevant seaplanes.
- 1.3 Width of water runways: The width of the water runway should be not less than 60 m wherever practicable.
- 1.4 Water Depth: The depth of the water measured at low water level in the water runway should not be less than 1.8 m (6 ft.) or less than 0.3 m below the hull or floats when the seaplane is stationary and loaded to maximum takeoff weight.
- 1.5 Water runway strip: A protective buffer should extend on each side from the edge of the water runway to a distance of not less than 30 m (100 ft.) and on each end of the water runway to a distance of 60 m wherever practicable. Other specification Turning Basins, Taxi Channels etc. also provided.
2. The guideline also mentions about Visual Aids for Navigation, Visual Aids for Denoting Obstacles, Wildlife Strike Hazard Reduction, Lighting of Movement Area, Rescue and Fire Fighting, Water Aerodrome Emergency Planning.

3 The above guideline may be accessed at:

<https://www.icao.int/APAC/Documents/edocs/APAC%20Guidance%20on%20WA%20for%20Seaplane%20Operations.pdf>

B. Other Aerodromes:

Civil Aviation Requirements of DGCA for Aerodrome Design and Operations lays down requirements for aerodromes infrastructure including taxiways, Aprons, markings, aeronautical lightings, emergency services and maintenance standards in India. It further mentions that Guidance on all aspects of the planning of aerodromes including security considerations may be according to the ICAO Airport Planning Manual, Part 1. Guidance on land-use planning and environmental control measures may be according to the ICAO Airport Planning Manual, Part 2.

1. ICAO Airport Planning Manual, Part 1 may be accessed at :
https://www.idrf.de/wp-content/uploads/2015/03/9184_p1_cons_en.pdf
2. ICAO Airport Planning Manual, Part 2 may be accessed at :
<http://www.icccc.org.cn/upload/file/20190102/Doc.9184-EN%20Airport%20Planning%20Manual%20Part%202%20-%20Land%20Use%20and%20Environmental%20Control.pdf>
3. The manual on aerodrome licensing procedures of Director General of Civil Aviation, GOI describes the rules and procedures used by DGCA to process applications for the issue of aerodrome license. It is designed to ensure that the standards and requirements are applied when an aerodrome license is issued.



MAJOR INITIATIVES OF GOVERNMENT TO RELATED TO TRANSPORT AND MOBILITY

1. Road Sector

1. **The Pradhan Mantri Gram Sadak Yojana (PMGSY)**, was launched by the Govt. of India to provide connectivity to unconnected Habitations as part of a poverty reduction strategy. Govt. of India is endeavoring to set high and uniform technical and management standards and facilitating policy development and planning at State level in order to ensure sustainable management of the rural roads network. According to latest figures made available by the State Governments under a survey to identify Core Network as part of the PMGSY programme, about 1.67 lakh Unconnected Habitations are eligible for coverage under the programme. This involves construction of about 3.71 lakh km. of roads for New Connectivity and 3.68 lakh km. under upgradation.
2. **National Common Mobility Card (NCMC)**, is an inter-operable transport card conceived by the Ministry of Housing and Urban Affairs of the Government of India. It was launched on 4 March 2019. The transport card enables the user to pay for travel, toll duties (toll tax), retail shopping, and withdraw money. It is enabled through the RuPay card mechanism. The NCMC card is issuable as a prepaid, debit, or credit RuPay card from partnered banks such as the State Bank of India, Bank of India, Punjab National Bank, and others.
3. **FASTag** is an electronic toll collection system, operated by the National Highway Authority of India (NHAI). It employs Radio Frequency Identification (RFID) technology for making toll payments directly from the prepaid or savings account linked to it or directly toll owner. It is affixed on the windscreen of the vehicle and enables to drive through toll plazas without stopping for transactions.
4. **Simplification of Driving License Application:** To improve ease in licensing, this Ministry has simplified the driving license application form.
5. **Revision of Axle Weight:** The amendment in permissible safe axle weight would increase the carrying capacity of goods vehicles by about 20-25 % and lower logistics costs by about 2%. It will also bring down the incidence of overloading.
6. **Launch of Ranking System for Toll Plazas:** NHAI has developed a matrix-based methodology to rank Fee Plazas on parameters such as electronic tolling, time taken in clearance of FASTag lanes, etc. Regional Officers would be collecting required data to rank Fee Plazas under their jurisdiction.
7. **Revision in Maximum Speed of vehicles:** The Ministry has revised the maximum speed of various classes of vehicles vide notification dated 6th April 2018.
8. **Acceptance of Documents through Digi Locker and mParivahan Platform:** An advisory has been issued by the Ministry to all the States and Union Territories in this regard.
9. **Notification regarding Vehicle Location Tracking Device and Emergency Button in all public service vehicles:** Detailed standards for Installation of Vehicle Location Tracking Device (VLT) and Emergency Button on public service vehicles have been notified on October 25, 2018. The States/ UTs have been mandated to ensure compliance of the rule at the time of checking of public service vehicles for fitness certification. The Command and Control Centres in states will be used to provide interface between various stakeholders.
10. **Use of Dual Fuel:** The Ministry has issued a notification for Dual fuel usage and combine harvesters driven by dual fuel diesel with CNG or Bio-CNG or LNG engines.
11. **Electric, Ethanol and Methanol Vehicles exempted from Permit:** The Ministry, vide notification issued on October 18, 2018, has exempted Battery-operated vehicles, as well as vehicles driven on Methanol fuel or Ethanol fuel, from the requirement of permit for carrying passengers or goods.



12. **Advisory on Linking of PUC data (emission related data) with the VAHAN database:** A system has been developed and tested by the Ministry in this regard.
13. **Notification regarding Registration Mark of Battery Operated Vehicles:** To give a distinct identity to EVs,, the registration mark will be exhibited on a number plate with Green background.
14. **M 15 (15%) Methanol blending with Gasoline:** The Hon'ble Prime Minister had announced an ambitious target of reducing 10% import dependence of oil and gas by 2022 from 2014-15 levels. Methanol can be used as an alternative transportation fuel thereby reducing omport dependence.
15. **Emission Standards for Construction Equipment Vehicles and Tractors:** Emission standards have been notified for construction equipment vehicles and tractors which would help in ensuring environment friendly construction / mining activities.
16. **Quadricycles included as Non-Transport Vehicles:** The Ministry notified the insertion of the item 'Quadricycle' as a 'non-transport' vehicle under the Motor Vehicles Act 1988. This makes it a cheap and safe mode of transport for last mile connectivity.¹
17. **BharatmalaPariyojana:** Implementation of the programme for the National Highways – “BharatmalaPariyojana Phase-I”, involves construction/ up-gradation of National Highways of 34,800 kms length over a period of 5 years at an estimated outlay of Rs. 5,35,000 Crore. The programme focuses on optimizing efficiency of freight and passenger movement across the country . Special attention has been paid to fulfilling the connectivity needs of backward and tribal areas.
18. **Delhi-Meerut Expressway (DME):** DME aims to provide faster and safer connectivity between Delhi and Meerut and beyond this, with Uttar Pradesh and Uttarakhand.
19. **Delhi – Vadodara Expressway:** This greenfield alignment, with a length of 844 km, would reduce the travel distance between Delhi – Vadodara by around 150 km.
20. **Funding Models and other policies to facilitate construction of National Highways:** Monetization of Assets through Toll-Operate-Transfer (TOT) Model, Infrastructure Investment Fund (InvIT).
21. E-initiatives:
 - 21.1 **Bhoomi Rashi - Land Acquisition portal:** With the adoption of portal w.e.f. 01.04.2018, the system has become transparent, error free, and paperless. The system ensures accountability at each level.
 - 21.2 **Enterprise Resource Planning (ERP) Project-eDISHA:** eDisha, Digitally Integrated System of Highway Assets, will eliminate data duplication and provide data integrity along with digitization. It will facilitate the flow of real time information across departments and ecosystems.
 - 21.3 **E-tolling:** Electronic Toll Collection (ETC) system, has been implemented to remove bottlenecks and ensure seamless movement of traffic and collection of user fee as per the notified rates, using passive Radio Frequency Identification (RFID) technology. IHMCL, is the implementing agency for ETC. 24 public/ private sector banks have been engaged as issuers for issuing FASTag. 536 out of 538 operational National Highways fee plazas are live with ETC infrastructure in all lanes.
22. **Major Initiatives taken by Land Acquisition Division:** Establishment of Highway Administration under the Control of National Highways (Land and Traffic) Act 2002.
23. **Way-side Amenities and Highway Nest (Mini):** Procurement process is under way for development of Way-side Amenities of larger sizes in PPP mode. NHAI has taken up construction of 450 numbers Highway Nest (mini). These are being developed near Toll Plazaswith facilities such as, toilets, drinking water, ATM, a small kiosk with Tea/ Coffee vending machines and packaged food items.
24. **Launch of Annual Awards for Excellence In National Highways Sector:** the purpose of these awards is to recognize the well performing concessionaires and contractors.

¹All of the above initiatives are taken by Ministry of Road Transport and Highways. May be accessed at <https://morth.nic.in/initiatives>.



25. **Financial Assistance for Road Development:** In order to assist the State Governments in the development of state roads, Central Government provides financial assistance out of the Central Road Fund (CRF) and Inter State Connectivity and Economic Importance (ISC & EI) scheme. Besides National Highways development Project (NHDP) & National Highway Interconnectivity Improvement programme (NHIIP), Ministry is implementing SARDP-NE & LWE schemes which includes National Highways and State roads.
26. **Development and Maintenance of National Highways:** The Government is implementing Bharatmala and National Highways Development Project (NHDP).
27. **State PWD and Border Road Organization (BRO):** An amount of Rs. 30,284.00 crore has been allocated during current year 2019-20, for the NH entrusted to State PWDs and Rs. 350.00 crore for NHs entrusted to BRO for Development of NHs/roads. (ii) An amount of Rs. 1,427.17 crore including Rs. 140 crore for BRO has been allocated during 2019-20 for the maintenance of National Highways entrusted to the State PWDs & BRO.
28. **National Highways Interconnectivity Improvement Projects:** It includes Road Improvement and Maintenance, Institutional Development Components, Road Safety Components.
29. Inter State Connectivity and Economic Importance (ISC&EI) schemes.
30. **Indian Academy of Highway Engineers (IAHE):** The Academy has been playing pivotal role in imparting training to highway engineers.
31. **The National Highways & Infrastructure Development Corporation Limited (NHIDCL):** NHIDCL is a Public Sector Undertaking under the Ministry of Road Transport and Highways, with the objective to develop National Highways and other infrastructure at a fast pace in the North East and Strategic areas of the country sharing International Borders.
32. **New National Permit System:** In order to facilitate inter-state movement of goods carriages, a new national permit system has been implemented in all States/Union Territories with effect from 08.05.2010.
33. **Major initiatives under Motor Vehicle Legislation:** The Motor Vehicles Act, 1988 is the principal instrument through which road transport is regulated in the country. The same has been superseded by The Motor Vehicles (Amendment) Act, 2019.
 - i. Acceptance of Driving Licence, Registration Certificate and other documents presented in Electronic form thorough IT or mobile app platform.
 - ii. Common Format for the Driving Licence and the Certificate of Registration.
 - iii. Removal of Requirement of NoC for the renewal/change of address in the Driving Licence.
 - iv. HSRP (High Security Registration Plate)
 - v. Hybrid Electric System
 - vi. Braking System and Anti-Lock Braking System
 - vii. Additional features for fully built buses (AIS 135 and AIS 153)
 - viii. Affixing reflective tapes on commercial Vehicles.
34. **Steps taken to reduce vehicular pollution and use of green fuels:** The Ministry has issued emission standards for additional alternate fuels usage in motor vehicles.
35. **Integrated Road Accident Database (IRAD) management system:** This will enable the States and Centre to develop and implement 'data-led' road safety interventions to reduce accidents
36. **Strengthening of Road Transport System Scheme** is to provide financial assistance to State Governments for use of latest technologies such as GPS/ GSM etc. for services covering inter-city and mofussil areas and to provide financial assistance for preparation of total mobility plan for entire state.



37. **Development of Bus Terminals-** The scheme was launched in 2018 in states/ UTs on BOT/ HAM basis with an aim to enhance the capacity and quality of the bus terminal infrastructure to benefit the users of the public bus transportation by providing them safe, convenient and user-friendly locations to board and de-board as well as better passenger amenities.
38. **Safety and Security of Women Passengers (Nirbhaya Scheme):** A dedicated fund, 'Nirbhaya Fund', has been set up by the GOI to give financial assistance to the States/ UTs for the projects specifically designed to improve safety and security of women in public transport.
39. **Accessible India Campaign (Sugamya Bharat Abhiyan):** Targets of the Campaign include (i) 25% of Government owned public transport vehicles should be made fully accessible by March 2019 (ii) All bus stops/ terminals/ ports should be made accessible (iii) Facilities for speedy licensing and registration may be provided to differently abled persons.
40. **Other Citizen friendly initiatives:** it include, removing red and amber lights atop the vehicles with the exception of specific dignitaries/ duty related categories. A fixed compensation of Rs. Five Lakh has been notified under the Structured Compensation for Third party insurance liabilities. The safety standards of the vehicles have been upgraded.
41. Guidelines for setting up Driver Training Schools in districts.
42. Sukhad Yatra App and Toll-Free Emergency Number.

2. Rail Sector

A. Initiatives by Indian Railways (IR)

1. Gatimaan Express is Indian Railways' fastest train, attaining speeds of 160 kmph between Delhi and Agra. Vande Bharat Express, a world-class engine-less train has the potential to hit 180 kmph, but the maximum operational speed on its routes is 130 kmph. Besides, the speed on Delhi Mumbai and Delhi Howrah routes is also planned to be raised to 160 kmph by 2022-23. Passenger trains have also got approvals to raise 60% increase in average speed².
2. **Procurement of goods rakes by inviting private investment:**
 - i. General Purpose Wagon Investment Scheme (GPWIS)
 - ii. Liberalized Wagon Investment Scheme (LWIS)
 - iii. Special Freight Train Operator (SFTO)
 - iv. Automobiles Freight Train Operator Scheme (AFTO)
 - v. Wagon Leasing Scheme (WLS)
3. Development of private freight terminals through private investment.
4. The new fully air-conditioned Vande Bharat Express was introduced with higher speed, comfort and facilities.
5. Computer based on-line system was adopted from January 2009 for analyzing Punctuality Performance.
6. **Catering Services:** Initiatives include, upgradation of Kitchen Units; installation of CCTV cameras to monitor kitchen activities on real-time basis with live streaming available on the IRCTC website as well as Rail Drishti; QR code on food packets; hand-held POS machines; awareness Campaigns for passengers, etc.
7. **Rail Tourism:** The various tourism business segments of IRCTC include Luxury Train Tours, International and Domestic Air packages, Land Tour Packages, Hotel booking, Cruise Packages, Customized and LTC tours and Event Management etc. Online booking of retiring-rooms at stations, hotel booking and IRCTC Mobile App is a step towards promoting digitalization initiative of Government of India.

²Currently, Shanghai Maglev has the highest maximum operational speed of 430 km/h and average speed of 251 kmph



8. **Passenger Reservation System (PRS):** Computerized reservation terminals, the facility of e-ticket has been made available for all Mail and Express trains through www.irctc.co.in website.
9. **Automatic Ticket Vending Machines (ATVMs)/Coin-cum-Card Operated Automatic Ticket Vending Machines (CoTVMs).**
10. **Special Features of Ticket Booking on Indian Railways:** such as, E-ticketing system, rationalisation Of FlexifareScheme, information on status of booking, Alternate Train Accommodation Scheme –“ Vikalp”, Yatri Ticket Suvidha Kendra (YTSK), etc.
11. **Coaching Vehicle:** Manufacture of Train sets, increasing production of LHB coaches, Amenities for unreserved passengers, Improving amenities for reserved passengers,improving safety in new manufactured coaches, etv.
12. **Improving interiors of Coaches:** Project Swarn, Upgradation of rakes of Mail/ Express trains (Project Utkrisht).
13. **Cleanliness on Trains:** Intensive mechanized cleaning of coaches, Clean Train Stations (CTS) scheme, On Board House Keeping Service (OBHS), ‘Clean My Coach’ / ‘Coach Mitra’ service, Automatic Coach Washing Plants, Mechanized laundries for washing of Linen.
14. **Cleanliness at Stations:** Provision of Integrated Housekeeping Contracts at major stations, award of rag picking / garbage disposal contracts, Mechanized cleaning at stations, Concrete washable aprons on platform tracks are provided to facilitate clearing of night soil on platform lines by washing with water jets, Enforcement of Indian Railways (Penalties for activities affecting cleanliness at railway premises) Rules, 2012 has been intensified, Use of CCTVs is being extended for monitoring cleanliness work at major Stations, Social / Charitable Organisations / NGOs have been associated in periodic cleanliness / awareness drives,.
15. **Track Upgradation and modernisation:** Higher speed and heavy axle load operation of IR has necessitated up-gradation of the track structure. Several policy initiatives have been taken in order to modernize the track by working towards progressive mechanization , maintenance, laying, inspection and monitoring of track.
16. **Track Recording Cars (TRC)-** are deployed for electronic monitoring of track parameters at periodic intervals to enable planning of maintenance.
17. **Level Crossing-** To improve safety of train operation and reduce inconvenience to road users, level crossings are being replaced by Road Over/Under Bridges/ Subways (ROBs/RUBs) in a phased manner based on the quantum of traffic.
18. **Bridge inspection and management System:** Modern Bridge Inspection techniques have been adopted, which include testing by non-destructive testing equipments, under water inspections, monitoring the water level with the help of water level system etc.
19. **Land Management:** Through an amendment to Railways Act, 1989, Rail Land Development Authority (RLDA), under the Ministry of Railways was constituted in 2006 to undertake all tasks related to commercial development on railway land/air-space under the control of Ministry of Railways. Besides commercial development of vacant Railway land, RLDA has also been assigned the task of development of Multi-Functional Complexes (MFCs). All Zonal Railways to make provision of 1% in all estimates to environment related matter. Railway land is leasedto Central/State Governments/Public Sector Undertakings for public utility purposes like ROB/RUB, construction/ widening of roads, etc.
20. **Railway Electrification:** Indian Railways has been progressively electrifying its rail routes to modernize the system and make it more eco- friendly.
21. **Signalling:** Advanced Signalling System with Panel Interlocking/Route Relay interlocking/Electronic Interlocking (PI/RRI/EI) along with Multi Aspect Colour Light Signals are being provided at stations.
22. **Automatic Train Protection (ATP) System:** Indian Railways has adopted Automatic Train Protection (ATP) System using a mix of proven European Train Control System (ETCS) level 2 and indigenously developed Train Collision Avoidance System (TCAS).



23. **Centralized Traffic Control (CTC) in Indian Railways:** It is a computer based system which facilitates the control and management of multiple signalling installations at various stations from a single location. It also provides a real time simulation of railway traffic in a section at a single location.
24. **Train Management System (TMS)** is a tool to control train movements. Announcements at stations are triggered automatically from the central servers. IR is planning to provide Train Management System at the suburban sections of metro cities.
25. **Telecommunication:** Indian Railways has set up a nationwide telecom network for meeting its communication needs, called, RailTel. Wi-Fi facility is to be provided at all stations excluding Halt Stations for internet facility to passengers which will aid in “Digital India” initiatives of Government of India.
26. **Rashtriya Rail Sanraksha Kosh (RRSK):** The Fund under RRSK are utilized for safety works relating to Traffic Facilities among other specified works.
27. **Modernization of Workshops:** Central Organisation for Modernisation of Workshops (COFMOW) was established under the Ministry of Railways by the Government of India for modernizing Indian Railways workshops. COFMOW is now taking up composite turnkey projects of setting up workshop/expansion of PUs’ workshops as well as specialised technical projects allotted by Ministry of Railways.
28. **Research and Development:** Research Designs Standards Organisation (RDSO) ,under Ministry of Railways, offers international consultancy services in matters pertaining to design, testing and inspection of railway equipment as well as survey for construction of new lines.
29. **Green Energy Initiatives on IR:** As an initiative to provide thrust to environment and climate change, Indian Railways has given big focus on tapping renewable energy by way of setting up solar & wind plants.
30. **Escalators and Lifts:** With an objective to provide ease of movement to differently abled, aged and children on Railway platforms IR has been providing lifts and escalators under ‘Sugamya Bharat Abhiyan’.
31. Improved illumination level at Railway Stations
32. **Use of IT:** (i) ODC Crossing Approval Monitoring System (ii) Rail-Saver A web/mobile based application which captures energy data related to energy conservation, energy management and renewable energy (iii) Traction Distribution Management System (TDMS)
33. **Awards:** Various units of Indian Railways and PUs & PSUs are being honoured with various awards for taking works of excellence in the field of energy efficiency and Green Energy.
34. Indian Railways have installed bio-toilets in coaches to prevent open discharge of human waste on Tracks.
35. Remote Monitoring and Management of Locomotives and Trains (REMMLOT) enables analysis of lapses on part of the loco pilot. It monitors condition of locomotive and helps in preventive maintenance of the same.
36. **CNG/ LNG DEMU-** Presently, CNG DEMU rake are running in four sections viz., Rewari- Rohtak, Delhi-kurukshetra, Delhi- Samli and Farukhnagar- GarhiHarsaru - Delhi Sarai Rohilla section of Northern Railway.
37. **Human Resource Development and Manpower Planning:** In addition to in house training facilities, Railway men are provided specialized training in other institutions in India and abroad. They are also encouraged to enhance their knowledge and skill by acquiring higher educational qualifications in the specified areas relevant to their work by granting financial incentives.
38. **National Rail & Transportation Institute (NRTI):** The country’s first University focused on the Transportation sector, has been set up to establish an institute in transportation-focused applied education, training and research. NRTI has signed MoUs with leading global Universities to establish collaborative frameworks for faculty exchange, developing curriculum, undertaking joint research projects and executive education programs.



39. **Indian Railway Medical Services:** Services provided include promotive, preventive, primary, secondary & tertiary health care to all beneficiaries.
40. **Facilities to Persons with Disabilities:** A reservation quota in 3AC and in Sleeper Class; the facility to book concessional e-tickets online; specially designed coaches known as SLRD coaches; modified toilet for persons with disability; wheel chairs and Battery operated cars are provided at major stations to facilitate boarding/alighting of physically challenged persons and senior citizens along with their baggage. 25% of STD / PCO booths have been reserved for PWD (Divyangjan) (including blind)
41. **Separate Reservation Counters:** Separate counters are earmarked to various Passenger Reservation System (PRS) centers
42. **Security:** The Railway Protection Force (RPF) has been constituted under the RPF Act, 1957 (as amended in the year 1985 and 2003) for better protection and security of Railway property, passenger area, passengers and matters connected therewith.⁴⁰

B. Initiatives by Delhi Metro Rail Corporation (DMRC):

- i. Increased indigenization of Rolling Stocks resulted in boosting local manufacturing and generation of employment opportunities.
- ii. Improved Asset Based Management System
- iii. Customer Facilities: Automatic Fare Collection Gates, Token Vending Machines, etc.
- iv. Improvements at station surrounding by undertaking special cleanliness drives
- v. Installation of Platform Screen Doors
- vi. Cashless transactions and Smart Cards
- vii. Customer Satisfactory Survey to receive feedback from customers and act upon the same accordingly.
- viii. Initiative to provide last mile connectivity through feeder buses.

Source: Annual Report of Delhi Metro (2018-19)

C. National Capital Region Transport Corporation (NCRTC)–

It is mandated for implementing the Regional Rapid Transit System (RRTS) project across the NCR of India, ensuring a balanced and sustainable urban development through better connectivity and access.³

3. Aviation Sector

1. **Regional Connectivity Scheme:** AAI, is the implementing Agency for RCS-UDAN. The primary objective of RCS is to facilitate / stimulate regional air connectivity by making it affordable.
2. Comprehensive National Civil Aviation Policy (NCAP) was launched in 2016 for promoting rapid growth of the sector, ease of doing business and advanced regional connectivity.
3. **Air Cargo:**
 - i) Airport Authority of India Cargo Logistics & Allied Services Company Ltd. (AAICLAS) has been set up as a wholly-owned subsidiary of AAI.
 - ii) Setting up Air Freight Stations (Off-airport Common User-Facility) has been encouraged.
 - iii) IT-based Cargo Management and Mobile Apps have been developed by AAICLAS/ AAI for functioning at their pan-India air cargo facilities.
 - iv) An Inter-Ministerial Air Cargo Logistics Promotion Board (ACLPB) has been constituted to promote better, inter-ministerial coordination and to take forward the needed interventions to promote growth of air cargo.
 - v) Key Initiatives for improving efficiency, transparency and ease of doing business:

³Source: <https://www.ncrtc.in/>



- vi) A digital National Air Cargo Community System is being developed as a common platform for all stakeholders to communicate with each other digitally and improve ease of doing business in air cargo sector.
 - vii) e-Sahaj, an online portal for processing 22 types of security related clearances has been introduced, in order to streamline the procedure and to make it time-bound.
 - viii) Airport Entry Permits (AEPs) for businesses (e.g. MROs) and other employees (including visitors) within airports has been introduced.
 - ix) No Objection Certificate Application System (NOCAS) for height clearance of structures, including buildings, introduced by Airports Authority of India (AAI).
 - x) 24x7 Customs clearance facility is now available at Air Cargo Complexes. Upgrading of air cargo screening facilities carried out at most terminals.
 - xi) Single Window Interface for Facilitating Trade (SWIFT) clearances system has been introduced on ICEGATE portal covering requirements of all Partner Government Agencies (PGAs).
 - xii) Customs authorities have eliminated the need for physical documentation for Customs clearances
 - xiii) Other air cargo facilitation measures taken up include reduction of free period for air cargo clearance from 72 hours to 48 hours w.e.f. 01.04.2017, notifying service level standards to all stakeholders for reduction of dwell time, and use of digital signatures for transmission of messages and digital submission of documents under SWIFT.
4. Rajiv Gandhi National Aviation University: infrastructure for students, officials and faculty members with a dedicated data center, smart classrooms with the latest audio-visual training aids.
 5. Skill Development in Aviation Sector: Government has laid out a road map for “Aviation Education and Skill Building” through the National Civil Aviation Policy, 2016.
 6. An MoU has been signed between the Ministry of Civil Aviation of the Republic of India and the Department of Infrastructure and Regional Development of the Commonwealth of Australia for promotion and development of cooperation in Civil Aviation Security.
 7. Redressal of Public Grievances: CPGRAMS has been implemented in the Ministry for prompt and effective redressal of grievances.
 8. AirSewa is an initiative of Ministry of Civil Aviation where passengers are able to register their grievances. It operates through an interactive Web Portal as well as through a mobile app.
 9. The Flight Standard Directorate (FSD)- safety oversight of scheduled/non schedule operators and their air crew to ensure effective implementation of safety related standards and recommended practices as prescribed by ICAO.
 10. The directorate of Aerodrome Standards - Inspection and licensing /authorization of aerodrome/heliport and monitoring of the aircraft operations at aerodromes vis-avis the facilities provided at the aerodrome/heliport approved/licensed by this directorate.
 11. DGCA has accorded top priority for Bird/Wildlife Hazard Management by Airport operators and major initiatives have been taken in this direction to effectively deal with this challenge.
 12. Bureau of Civil Aviation Security: to safeguard civil aviation operations against acts of unlawful interference.
 13. Airport Authority of India: To control and manage the India Air Space (excluding special user air space) extending beyond the territorial limits of the country as accepted by ICAO; Communication, Navigation and Surveillance Aids; Expansion and Strengthening of operational areas viz. Runways, Aprons, Taxiways etc.; Design, Development, Operation and Maintenance of Passenger Terminals, Development and management of cargo terminals.



14. Air Navigation Services (ANS) : AAI has inducted new technology and upgraded CNS ATM system in its existing ANS infrastructure to cope up with increasing Air Traffic Growth.
15. Facilities to Persons with disabilities: Smooth ramps with anti-skid flooring at terminal building entry points and Kerb area, sensor fitted doors, specially designed handicapped toilets, availability of wheel chairs etc. at airport terminals.
16. Air India Mobile App for quick, easy and convenience of booking on all Air India flights.
17. Pollution Control: Air India Limited in all new Civil/Electrical works, are using LED lights to reduce carbon footprint. Solar Plants are being installed. As a green initiative, the company has gone for large scale plantation in its premises.
18. Indira Gandhi Rastriya UranAkademi – Conduct airline oriented flying training courses to the level of contemporary international standards.
19. Pawan Hans Limited: Providing helicopter support services to the oil and gas sector in offshore exploration, operate in hilly and inaccessible areas, make available charter flights for promotion of travel and tourism.
20. Helliport/Hellihub in Delhi: Pawan Hans has developed and operationalized India's first heliport in Rohini, Delhi in 2017.
21. Rajiv Gandhi National Aviation University – to facilitate and promote aviation studies and research, achieve excellence in areas related to aviation sector, produce quality human resource, create a strong base with a pool of scientific and technical manpower in the civil aviation sector.⁴
22. NABH Nirman Scheme: NextGen Airports for Bharat (NABH) aims to increase the number of Airports and their capacity to handle traffic.
23. Manual on aerodrome licensing procedures of DGCA, GOI

⁴For further details about initiatives mentioned above under Aviation Sector the following link may be accessed:https://www.civilaviation.gov.in/sites/default/files/annual_report-2017_18_en.pdf



Annexure-D-5.1.3

BRIEF NOTE ON NATIONAL INITIATIVES ALONG WITH FEW INTERNATIONAL EXAMPLES REGARDING ROAD SAFETY

1. A brief background of major initiatives at national level is as following:

A. Norms/Standards/Guidelines

- i) URDPFI Guidelines, 2014 by Ministry of Urban Development in its para 8.2.17 mentioned that Road safety is to include design strategies for elements that make up the urban environment at various scales must be clearly articulated, and must be integrated with relevant development regulations (Development Plan, Local Area Plans, Urban Design Guidelines, etc.). A checklist of road safety indicators is provided in Appendix K of Volume II B of the document. The principle of road safety to be included at Regional planning level (Mobility 1), Development Plan Preparation level with CMP (Mobility 2) and local area plan level to create safe infrastructure. A checklist of road safety indicators is provided in Appendix K of Volume II B of the document.
- ii) Indian Road Congress:
 - Indian Road Congress has published Road Safety Audit Code i.e. SP-88-2010.
 - Indian Road Congress has published Road Safety Audit Code i.e. IRC 103 2012 to ensure all footpaths have a dead zone, uninterrupted walking zone as per this Code.

B. National Road Safety Policy (NRSP)

- i) In 2005, the Government had constituted a Committee under the Chairmanship of Shri S. Sundar, Former Secretary (MoST) to deliberate and make recommendations on creation of a dedicated body on road safety and traffic management. The Committee was also to finalise a draft National Road Safety Policy for consideration of the Government. The Committee while submitting its report in February, 2007 inter alia, recommended a draft National Road Safety Policy. Based on the recommendations of Sunder Committee, the Union Cabinet on 15.03.2010 approved National Road Safety Policy. The National Road Safety Policy outlines the policy initiatives to be framed / taken by the Government at all levels to improve the road safety activities in the country.
- ii) As per NRSP, the Ministry of Road, Transport & Highways (MoRTH), Government of India is the nodal Ministry for the road safety policy matters and MoRTH has established a dedicated agency viz. a National Road Safety Board to oversee the issues related to road safety and evolve effective strategies for implementation of the Road Safety Policy.

C. Present scenario of NCR participating States in terms of Road Safety Policy.

- i. In view of recommendations of the National Road Safety Policy, an overview of the implementation of these recommendations may be reviewed in respect of National Capital Region to compliance the same.
- ii. **Haryana (source: Transport Department, Govt. of Haryana website):** Govt. of Haryana, Transport Department (Regulatory Wing) vide Notification No.17/11/2013-3T-II dated 30.03.2016 has notified the Haryana Road Safety Policy in accordance NSRP.
- iii. **Transport Department, Govt. of NCT of Delhi** has mentioned that the NCT of Delhi has prepared draft Delhi Road Safety Policy in May, 2018 and published vide letter No.17(487)/Plg./Tpt/RS/2017/1300-1308 dated 03.05.2018.
- iv. **Rajasthan (source: Transport Department, Govt. of Rajasthan website):** The Government of Rajasthan, Transport Department vide letter No. Nil dated 28.07.2015 has published the Rajasthan Road Safety Policy.
- v. **Uttar Pradesh (source: Transport Department, Govt. of Uttar Pradesh website):** The Government of Uttar Pradesh has formulated the State Road Safety Policy, 2014. The government has formulated a multi-pronged



strategy to address the issue of road safety based on 4 'E' viz. Education, engineering measures (both road and vehicle), enforcement of safety laws and emergency care to road accident victims.

2. **Best examples/practices** worldwide show, that globally, countries are moving towards **zero tolerance policy on accidents** and transforming urban and road design for safety.
 - i) Many Western European and high-income countries in the Asia-Pacific region have reduced their burdens even more dramatically.
 - ii) *Japan reduced its disease burden from road injuries by 42 per cent between 1990 and 2010, and Sweden lowered its burden by 30 per cent.*
 - iii) *Sweden prioritizes safety over speed—low urban speed-limits, pedestrian zones and barriers to separate cars from bikes are the key measures.* It has proposed a speed limit of 30 km/hour, built 1,500 km of “2+1” roads where each lane of traffic takes turns to use a middle lane for overtaking – this has saved many lives. It has built 12,600 safer crossings along with strict policing that have halved the number of pedestrian deaths over the past five years. It has also integrated the guidelines for traffic safety and crime prevention under the Traffic for an Attractive City (TRAST). Swedish police guidelines include safety audit guidelines. Overall, *Slowing traffic down, separation of vulnerable people from motorized traffic, initiating awareness campaigns, and more pedestrian crossings and fines for violation of pedestrian spaces are some of the measures in place across Europe.*
 - iv) In the EU, fines are prescribed by law, either as part of a Road Traffic Act, or as subject of a special legislative provision.
 - v) In Finland, Sweden, Norway and Switzerland, the amount of the fine is decided on the basis of the net income of the offender and children as well (Finland).
 - vi) Paris has announced a maximum speed limit of 30 km/hour on all city streets. Careless driving can be fined up to UK £100 and points are added to the license number. A proposal from the department of transport restricts motorists to a speed of 15 mph, a fine of UK £100, and three penalty points for overtaking cyclists. This is for a few cities where cycle flows are high.
 - vii) San Francisco has enforced a Better Street Policy.
 - viii) New York City is promoting pedestrian infrastructure.
 - ix) In Auckland, the Land Transport (Road Users) Rule stops motorists from stopping or parking on a footpath and pedestrians have to be given right of the way.



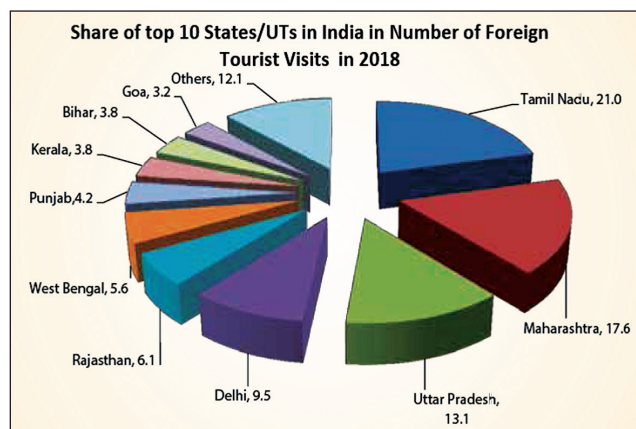
Annexure-D-6.1

6. TOURISM AND HERITAGE

Tourism and Heritage in NCR

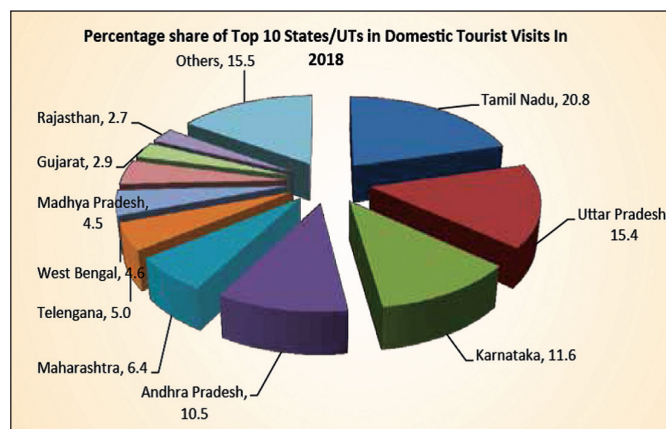
1. **Sub-region wise Heritage Sites:** NCT Delhi consists of 03 World Heritage Sites and has the highest number of centrally protected monuments (174¹), followed by Haryana sub-region (66) and Uttar Pradesh sub-region (31) and Rajasthan sub-region (24). State protected monuments are more in Rajasthan sub-region (38), alongside a larger number of unprotected monuments.
2. Domestic Tourists to NCR grew from 18.49 million in 2012-13 to 22.62 million in 2014-15. As per survey conducted by NSSO (72nd round, 2014-15) on tourism, illustrated that the majority of tourists (95 per cent) visited Delhi during the year for 'holidaying, leisure and recreation'.² In 2018, Foreign Tourist Arrivals (FTAs) at Delhi Airport was 28.83% amongst top 10 Indian international check posts accounting for 83.75% FTAs (i.e. 8.84 million out of total FTAs of 10.55 million)³. During 2018, about 9.49% of the total foreign tourists visited in Delhi, 13.09% in State of Uttar Pradesh, 6.08% in State of Rajasthan and 0.26% in State of Haryana. In respect of domestic tourists the share was 1.57%, 15.37%, 2.71% & 0.26% in Delhi, Uttar Pradesh, Rajasthan and Haryana, respectively⁴ (refer brief provided at **Table D-6.1.1**).
3. Table D-6.1.1- Sub Region Wise number of Domestic & Foreign Tourists in 2010, 2015 and 2018

Sl. No.	Sub Region	Domestic Tourist (in Lakhs)			Foreign Tourist (in Lakhs)		
		2010	2015	2018	2010	2015	2018
1	Delhi	13.56	25.26	29.11	18.93	23.79	27.40
2	Haryana	39.80	44.06	38.66	0.79	1.93	1.51
3	Uttar Pradesh	116.37	159.19	149.11	0.38	0.52	0.61
4	Rajasthan	1.53	1.96	2.77	0.22	0.11	0.13
Total NCR*		293.28	457.80	481.68	20.33	26.36	29.65



Figures D-6.1.1: Percentage Shares and Rank of Different States/UTs in Foreign Tourist Visits, During 2018

Source: India Tourism Statistics, 2019



Figures D-6.1.1/D-6.1.2 : Percentage Shares and Rank of Different States/UTs in Domestic Tourist Visits, During 2018

4. Details of centrally/State protected monuments (other than World Heritage Sites) is given at **Table D-6.1.2**. Sub-region wise list of such sites is given at **Tables D-6.1.3 to Table-D-6.1.6**. List of Major Museums in NCR is given

¹Source: [http://www.nma.gov.in/announcements/Draft%20Categorisation\(3\).pdf](http://www.nma.gov.in/announcements/Draft%20Categorisation(3).pdf)

²Source: *Economic Survey of Delhi, 2018-19, Chapter 21-Tourism in Delhi*

³Source: *India Tourism Statistics at a Glance, 2019*

⁴Source: *India Tourism Statistics, 2019 (page 104)* - <http://tourism.gov.in/sites/default/files/Other/India%20Tourism%20Statistics%202019.pdf>



at **Table-D-6.1.7**. Recently GoI has announced 5 Archaeological sites to be developed as iconic sites with on-site Museums to be completed in next 3 years. The proposed museums sites amongst others also include **Hastinapur (UP)** in NCR and another **Rakhigarhi (HR)-Hisar** at close proximity to NCR.

5. Key issues and challenges in Tourism Development in NCR are outlined in this document after **Table D-6.1.7**.

Table D-6.1.2- Sub Region Wise Number of Centrally & State Protected Monuments/Conservation areas

Sl. No.	Sub Region	Centrally Protected	State Protected	Monuments Listed by INTACH, 2019	Conservation Areas Listed by INTACH, 2019
1	Delhi	174	19	1,208	26
2	Haryana	66	9	334	0
3	Uttar Pradesh	31	4	0	0
4	Rajasthan	24	38	85	0
Total NCR		295	70	1,627	26

Source: <https://asi.nic.in/alphabetical-list-of-monuments-agra-circle/>, <https://asi.nic.in/protected-monuments-in-uttar-pradesh/>, RP 2021, SRP of Haryana, Report of Heritage Conservation Committee and Department of Archaeology, GNCT Delhi, <https://asi.nic.in/protected-monuments-in-haryana>

Table D-6.1.3 – ASI Protected Monuments in NCT Delhi, 2019

Sl. No.	Name of the Monument/Site	Location
1	Bastion, where a wall of Jahan panah meets the wall of Rai Pithora fort.	Adchini
2	Ramp and gateway of Rai Pithora's Fort	Adchini
3	Marble Tomb reputed to be that of Newab BahadurJawid Khan	Aliganj
4	Lal Bangla	Babarpur(Kaka Nagar)
5	Khair-ul-Manzil	Babarpur Bazipur(Kakanagar)
6	Kos Minar or Mughal Mile stone	Babarpur Bazipur(Kakanagar)
7	The Moti Gate of Shershah, Delhi	Babarpur Bazipur(Kakanagar)
8	Begampuri Masjid	Begampur
9	Phool Chadar aqueduct near Najafgarh Jhil aqueduct	Chaukri Mubarakabad
10	Lal Gumbad	Chirag Delhi
11	Tomb of Bahlol Lodi	Chirag Delhi
12	Ajmeri Gate	Bazar Ajmeri Gate
13	Alipur Cemetery	Delhi-Alipur Camping group.
14	Ashoka's pillar	Ferozabad (Ferozshah Kila or Vikram Nagar Colony)
15	Bara Khamba Cemetry	Imperial City
16	Chauburji	Ridge near Hindura Hospital
17	Eremo Cemenry	Kishanaganj Railway Stn.
18	Delhi fort or Lal Qila, Naubat Khana, Diwan-i-am, Mumtaz Mahal 'Rang Mahal, Baithak, Maseu Burj, diwan-i-Khas' Moti Masjid, sawan Bhadon, Shah Burj, Hammam with all surrounding including the gardens, paths, terraces andwater courses.	Red fort
19	Delhi Gate	Daryaganj
20	Enclosure containing the grave of Lt. Edwards and others, murdered in 1857.	North Ridge near flag Staff tower, Civil Lines.
21	Enclosure wall with Tomb of Najaf Khan	Safdarjang Fly over
22	Flag Staff Tower	400 yards North of Cheuburji Mosque
23	Jantar Mantar	Connaught place
24	Kashmeri Gate and portion of the City Wall on either side of theKashmeri Gate on the side and on the other up to and including the water Bastions at the Northern corner of thewall and also including the dith outside the City wall where this is exposed.	Kashmeri Gate



Sl. No.	Name of the Monument/Site	Location
25	Kotla Ferozabad with the remaining walls, bastions and gateways and gardens, the old Mosque, and well and all other ruins buildings it contains.	Two furlangs east of jail and three furlangs due south of S.E. Corner of Shahjahanabad, Delhi.
26	Lal Darwaza, the northern gate of the outer walls of the Delhi of Shershah.	Three furlang due south of Delhi Gate
27	Lothian Road Cemetery	Kashmeri Gate
28	The Mosque	Qudsia Garden
29	Mutiny telegraph Memorial	In front of Old Telegraph Building, Kashmeri Gate,
30	Nicholson (Or Kashmeri Gate) Cemetery	Kashmeri Gate
31	Nicholson statue and its platform and the surrounding gardens paths and enclosure wall.	Outside Kashmeri Gate
32	Old Baoli immediately to the west of Hindu Rao's House.	On the ridge, Delhi
33	The Old Entrance Gateway of the Garden.	Qudsia Delhi
34	The Pirghaib to the north and near Hindu Rao's House	On the ridge , Delhi
35	Portion of City wall near which Brij Jahn Nicholson was mortally Wounded on 14th Sept. , 1857.	On the ridge , Delhi
36	The Punjabi gate in the Roshanara bagh	Opposite Municipal Board school, SubjiMandi
37	Purana Quila (Inderpat) or Delhi With all its walls Arcades, gateways and Bastions, gardens, the Mosque of Sher Shah (Kila Kohna Masjid). The Sher Mandala and entrances to Subteranean passages.	Two miles south of the Delhi Gate of Shahjahanabad, Delhi
38	Rajpur (Mutiny cemetery)	Old Rajpur Cantonment, North Distt.
39	The remaining gateways of the old Magazira with their adjoining buildings.	The post office , Delhi
40	Sher shah's gate with the adjoining curon walls and Bastions and the remains of the double line of structure to its front	Opposite purana Qila immediately North-east of the Khairul Manazil Mosque
41	Site of Siege battery Known as the Sammy House Battery bearing the following Inscriptions Battery , Sammy house, Major Remington Tank, RACommanding armament 89 pounds. To command ground near Mori Bastion.	300 Yards East of mutiny memorial
42	Site of siege Battery with inscription.	East of the Hospital in police Line
43	Site of siege Battery with inscription.	Compound of Curzon House
44	Site of siege Battery with inscription.	In the garden near south west entrance to Delhi Club Ground
45	Sunehri Masjid near Delhi Fort	Delhi Fort
46	Tomb of Capt. Mac. Barnattothers who fall in an attack on	Kishan Ganj
47	Tomb of Ghiasuddin Khan,	Tughlaqabad
48	Tomb of Roshanara Baradari	Sabzi Mandi
49	Tomb of Razia Begum in Mohalla Bulbuli Khana	Shahjahanabad
50	Tomb of Safdarjang (Mirza Muqim Mansur Ali Khan) with all the enclosure walls, gateways, gardens and the mosque on the eastern side of the garden.	Lodhi Road, New Delhi
51	Tripolia Gateways	Delhi-Karnal Road
52	Uggar Sain's Baoli	Near Jantar Mantar
53	Tomb of Darya Khan	Kidwai Nagar East
54	Baoli at Ghiaspur	Nizammuddin
55	Tomb of Mirza Muzaffer, Chota Batasha No. 153, Ghiaspur	Nizammuddin
56	Tomb of Amir Khusro, Ghiaspur	Nizammuddin
57	Tomb of Mirza Muzaffer, Bara Batasha No. 151 Ghiaspur	Nizammuddin
58	Tomb of Nizamuddin Aulia, Ghiaspur No. 197	Nizammuddin
59	Unknown tomb Ghiaspur 153,	Nizammuddin



Sl. No.	Name of the Monument/Site	Location
60	i. The tomb of Ferozshah ii. Domed Building to the west of No.1iii. Dalan between 12 iv. Domed Building its court to the south ofNo. 3, v. Dalans and all ruined Buildings to the north of no. 1 and existing upto No.10 vi. Five Chhatris to the case of No. 1 No.5 vii. Old Gate to the north of No.6 viii. Three Chhatris to the north-west of No.7ix. Ruined courtyard and its Dalans with the Domed building to the north-west to the No.8x. Old wall running east from No.4 xi. 2.23 Acres of lands surrounding the above monuments and bounded on the North by house of Chhangeand Mehra Chand sons of Hansram and house of Uderam, son of Kusha South Ghairmunkan Resta East By village site belonging to village community house of Nots Zadar sons of Jai Singh Chhamar and field Nos. 338 331 belonging to Naider and others West By field no. 185 belonging to Udaram, son of Kusal Jat and field No. 186 belonging to Jagins and Sajawal Rajput, No.195 Ghairmunkin Johar, common of Jats and Musalmans and filed no. 196, Ghairmunkin Pall.	Hauz Khas
61	Bag-i-Alam Gumbad with a Mosque	Humayunpur
62	Kali Gumti	Humayunpur (Hauz Khas)
63	Tefewala Gumbad	Humayunpur Deer Park (Hauz Khas)
64	Arab Sarai	Patti, Ghiapur in Hauz Inderpat
65	Arab Sarai Gateway of North towards Purana Qila	Near Arab Sarai Village
66	Arab Sarai Gateway towards Humayun tomb	Near Arab Sarai Village
67	Remainig Gateways of Arab Sarai & Abadi-Bagh-Buhalima	Near Arab Sarai Village
68	Lakhar wal Gumbad (Tomb)	Inderpat Estate (Sunder Nursery), Near Delhi Public School, Mathura Road, Nizamuddin
69	Sunderwala Burj	Inderpat Estate (Sunder Nursery)
70	Sunderwala Mahal	Inderpat Estate (Sunder Nursery)
71	Bijay Mandal, neighbouring domes, buildings and dalan to north of Begumpur	In village Kalusarai/Sarvapriya Vihar
72	Old Lodi Bridge with approaches	Near Sikander Lodi tomb, Khairpur
73	Mosque with the dalans and courtyard and the Bara Gumbaj (the domed entrance to the mosque)	Khairpur
74	The tomb of Mohammed Shah known as Mubarak Khan- Ka-Gumbaz	Khairpur
75	Tomb of Sikander Lodi with its enclosure wall and bastions, gates compound	Khairpur
76	Unknown tomb with blue tiles decoration known as Shisha Gumbad	Khairpur
77	Bandi or Poti ka Gumbad III-280	Kharera village between Hauz Khas and Qutab road
78	Biran-Ka-Gumbad-282	
79	Biwi or Dadi-ka-Gumbad-281	
80	Chor Minar No. 289 Vol III	Kharehra (Hauz Khas Enclave)
81	Choti Gunti	Kharehra village Green Park
82	Idgah of Kharehra No. 287, Vol III	Kharehra village Hauz Khas Enclave
83	Nili Mosque	
84	Sakri Gumti-284	Kharehra village Green Park
85	Khirkkee Masjid	Village Khirkkee
86	Satpula-III -216	Village Khirkkee
87	Tomb of Usuf-Quttal	At Khirkkee in field no.81 min, Property of Shamlat deh.
88	Jahaz Mahal	Mehrauli
89	Shamsid Tallab together with platform entrance gates.	Mehrauli
90	Moti Masjid	Mehrauli
91	Old Palace of Bahadur Shah II alias Lal Mahal in Mehrauli	Mehrauli



Sl. No.	Name of the Monument/Site	Location
92	Bara Khamba-285	Kherera village tombs between Hauz Khas, Qutab road
93	The Qutab Archaeological area as now fenced in, including the Mosque, Iron Pillar, Minar of Qutab-din, unfinished Minar, all colonnads, screen arches, tomb of Altmash, college, buildings of Aluddin, Tomb of Imam Zamin and all carved stones in the above area with gardens, paths and water channels, and all gateways including the Alai-Darwaza, also all graves in the above area	Mehrauli
94	Tomb of Adam Khan (Rest House)	Mehrauli
95	Tomb and Mosque of Maulana Jamali Kamali	Mehrauli
96	Wall mosque	Mehrauli
97	Walls of Lal Kot and Rai Pithora's fort from Sohan Gate to Adam Khan's tomb including the ditch where there is an outer wall	Mehrauli Kh. No. 1783, 1765, 1766, 1767, 1770, 1772, 1773, 1798 1764
98	Walls of Lal Kot and Rai Pithora's fort at the point where they meet together	Near Jamali Kamali's Mosque Mehrauli Kh.No. 1754, Loddho Sarai Kh.No. 86,87
99	Wall of Rai Pithora's fort including gateways and bastions	Mehrauli
100	Gates and walls of Mubarakpur, Kotla in village Mubarakpur	Village Mubarakpur, Kotla
101	Moti-ki-Masjid	Behind south extension Part II.
102	Inchla Wali Gunti	village Mubarakpur, Kotla
103	Kala Gumbad	village Mubarakpur, Kotla
104	Tombs of Bade-Khan, and Mubarakpur Kotla, Kotla	village Mubarakpur, Kotla
105	Tombs of Chote Khan, Mubarakpur	Kotla
106	Tomb of Mubarik in Mubarakpur, Kotla	village Mubarakpur, Kotla
107	Mosque attached to Mubarak shah Tomb	village Mubarakpur, Kotla
108	Tomb of Bhura Khan	village Mubarakpur, Kotla
109	Tin Burji Walla Gumbad	Mohammed pur village II, 304
110	Unnamed tomb	Mohammed pur village, 305
111	Baoli	Munirka II. 318.
112	Munda Gumbad	Munirka 302.
113	Unnamed Mosque	Munirka 314.
114	Unnamed Tomb	Munirka 313.
115	Unnamed Tomb	Munirka 315.
116	Unnamed Tomb	Munirka 316.
117	Unnamed Tomb	Munirka 317.
118	i.Unnamed Mosque, ii.Unnamed Tomb	Munirka 321, Munirka 322
119	Wajir pur- ki-Gumbad	Munirka 312.
120	The Afsah-walla-ki-Masjid situated outside the west gate of Humayun's tomb with its dalans and paved court bounded on the east by Humayun's tomb on the west by Abadi Arab Sarai on the north by road and Khasra No. 252 and on the south by Abadi Arab Sarai	Nizammudin
121	Bara Khamba outside north entrance to shrine	Nizammudin
122	Bara Pulah bridge near Nizammudin	South of Nizammudin
123	Chausath Khamba and tomb of Mirza Nizammudin Aziz-ka-Kokaltash	Nizammudin
124	Grave of Jahanara Begum	Nizammudin
125	Grave of Mohammed Shah	Nizammudin
126	Grave of Mirza Jahangir	Nizammudin



Sl. No.	Name of the Monument/Site	Location
127	Humayun's tomb, its platforms, garden, enclosure walls and gateways Khasra No. 258 bounded on the east by Khasra No.180181244 of Miri Singh and on west by Kh. No. 268253 on the north by Khasra No. 266, on the south by Kh No. 245 of Miri Singh Kh. No. 248 249 of Sayyed Mohummad	Nizammudin
128	Nila Gumbad outside the south corner of enclosure of Humayun's tomb (Kh. No. 243) bounded on east by Kh. No. 182, on west by Humayun's tomb, on north by Kh. No. 181 on south by Kh. No.244 of Miri Singh	Nizammudin
129	Nili Chhatr or Subz Burz .	Nizammudin East
130	Tomb of Afsar-wala immediately near to the south of Afsar-wala-ki-Masjid	Nizammudin
131	Tomb of Atgah Khan	Nizammudin
132	Tomb of Isa Khan with its surrounding enclosure walls and turrest garden gateways and mosque (Kh. No. 281) bounded on the east by Arab Sarai Kh. No.236 on west by Kh. No. 283 graveyard of Piarelal & K.No. 283 of Bddon on north by Kh. No. 236 of Pandit Brij Vallabh, on south by Arab Sarai Kh. No. 238.	Nizammudin
133	Tomb of Khan-i-Khana	Nizammudin
134	Tomb with three domes near Rly.Station	Nizammudin
135	Sikargah Kushak-II -327	Old Kushak Village
136	Gateways of Badli-Ki-Sarai	Village Pipalthala
137	Tomb of Sheikh Kaburuddin also known as Rakabwala Gumbad in field no.84 min. situated at sarai Shah 31 property of Thoks Shahpur and Adhehini	Malviyanagar
138	Ruined line of walls, bastions gateways of siri Kh. No. 88, 265 447 at village Shahpur Jat	Shahpur Jat
139	Internal buildings of Siri Mehammadi wali-Kh. No. 14 Shahpur Jat Bul-Bul-Ki-Kh. No. 256 Shahpur Jat Makhdum ki Kh. No. 255 Shahpur Jat Baradari Shahpur Jat Motiyan wala dome Shahpur Jat Thana wala Shahpur Jat	Shahpur Jat
140	Nai-ka-kot.	Tughlaqabad. Kotla
141	Tomb of Ghiyasuddin Tughlaqabad. walls & bastions, gates and cause way including the tomb of Dad Khan	Tughlaqabad.
142	Tomb of Mohammed Tughlaqabadshah	Badarpur Zail
143	Walls of old city of Tughlaqabad.	Badarpur Zail
144	Walls, gateways bastions and internal buildings of both inner and outer citadels of Tughlaqabad fort	Tughlaqabad.
145	Walls, gate and bastions of Adilabad (Mohammadbad) and causeway leading there to from Tughlaqabad.	Tughlaqabad.
146	The Tomb	Wazirabad
147	The mosque	Wazirabad
148	Neighboring Bridge	Wazirabad
149	Mound known as Jaga Bai comprise in part of survey plot no. 167	Jamia nagar
150	Ashoka rock Edict	East of Kailash colony
151	Mandi Mosque	Ladho Sarai
152	Rajon-ki-Bain with Mosque and Chhatr	Ladho Sarai
153	Badun Gate	Ladho Sarai
154	Gateway of Lal kot	Ladho Sarai
155	Gateway of Rai Pithoria's fort	Ladho Sarai
156	Walls of Rai Pithora's fort and Jahan Panah at the point where they meet together	Hauz Rani abd Lado Sarai
157	Tomb of Sultan Ghari	Nalikpur Kohi
158	Baoli known as diving wall/locally Candak-ki-baol	Mehrauli



Sl. No.	Name of the Monument/Site	Location
159	Enlosure containing the tomb of Shah Alam Bahadur Shah, ShahAlam to and Akbar Shah II	Mehrauli
160	Houz Shamsi with central red stone pavilion situated at Mehrauliin field No. 157-81, 1586-97, 1614 1624	Mehrauli
161	Iron Pillar Hindu	Mehrauli
162	Anceint Mosque	Palam
163	Sheesh Mahal	Shalimar Garden Village Hyderpur
164	Ashokan Pillar	On Ridge between HinduRao Hospital
165	Sarai Shahji	Malaviya Nagar
166	Azim Khan Tomb	Lado Sarai
167	Mazar of Sheikh Muhammad Ibrahim Zauq	ChindBagh, Kadam Sherif, Paharganj, Delhi
168	Fortification Wall Asad Burj, Water gate, Delhi Gate, Lahori Gate, Jahangiri Gate, Chhattra Bazar, Baoli	Red Fort, Delhi
169	Fortification walls, Gates, Bastions and Ancient Buildings of Salimgarh Fort	Bela Road
170	Portion of the City Wall of Shahajanabad	Ansari Road
171	SatNarain Bhawan	Sat Narain Bhawan, Delhi Sadhora Khurd, Dina Nath Marg, New Delhi
172	BalbanKhan's Tomb Jamli Kamali	Lado Sarai, Mehrauli, Delhi
173	UnknownTomb in vicinity of JLN Stadium	Pragati Vihar, New Delhi
174	Mazarof Mirza Ghalib	Nizammudin

Source: <https://asi.nic.in/alphabetical-list-of-monuments-delhi/>

Table D-6.1.4 - Protected Monuments in UP Sub Region, 2019

S. No.	District	Location	Centrally Protected (Number)	State Protected (Number)
	1	2	3	4
1	Meerut	At the junction of Meerut-Delhi road	Cemetery at the junction of Meerut – Delhi Road	i) Baleshwarnath Temple ii) Begam Samru Mahal
2		Sardhana	i) Begum's Palace, (ii) Roman Catholic Church (iii) Tombs or Sardhana Cemetery	
3		Hastinapur	Mound known as Ulta Khera and the mound or Raghunathji	
4		Servara	Two mounds (Kheras) named Khorkali and Jalapar	
5		Meerut	i) Andhra Court, a high brick fortress supposed to have been built by Mahi, (ii) Cemetery of the Meerut racecourse, (iii) Tomb of Shah Peer	
6	Ghaziabad	Paragana put, Mustafabad	Raja Karan ka khera	
7	Bulandshahr	Ahar	Several large tumuli (Kheras) in and about Ahar.	
8		Chandok	Ruins of an old temple known as Chandrani-ka-Mandir	
9		Bulandshahr	Balai Kot or Upper Fort	
10			Large mound known as Moti Bazaar	
11			Two cemeteries	
12		Indor	Ahirpura mound or lesser temple mound	
13			Kundanpura mound or the great temple mound	
14			Lofty mound with a small village perched on the east northeastern side of it.	
15		Shikarpur	Khera or mound called Talapatnagari or Myaji Khera	
16		Dankaur	Masonry tank and ancient temple	



S. No.	District	Location	Centrally Protected (Number)	State Protected (Number)
	1	2	3	4
17	Baghpat	Bamnauli	Ancient mound at Kasuri	
18		Alamgirpur	Mound known as Parasu Ram ka Khera	
19		Barnawa	Mound known as Lakha Mandap	
20	Gautam Buddh Nagar	Gulistanpur	Archaeological Site Remains comprised in Survey Plot Nos. 736, 738/2, 738/3 parts of Survey Plot Nos. 737, 738/1 and 738/1 and 738/4 as shown in the site plan	
21	Muzaffarnagar	Majhera	Octagonal Wall	i) Mausoleum of Baba Garibnath (ii) Purana Makbara, Bantikheda
22		Majhera	Tomb of Diwan Saiyed Mohammad Khan	
23		Majhera	Tomb of Saiyed Umar Nur Khan	
24		Majhera	Tomb of Saiyed Saif Khan and his mother	
25		Majhera	Tomb Saiyed Hussain also called Sayed Chajju Khan	
26	Shamli	Jinhana	Mosque and Tomb of Shah Abdul Razak and his four sons	

Source: <https://asi.nic.in/alphabetical-list-of-monuments-agra-circle/>, <https://asi.nic.in/protected-monuments-in-uttar-pradesh/>

Table D-6.1.5 - Protected Monuments in Rajasthan Sub Region, 2019

S. No.	District	Location	Centrally Protected	State Protected
	1	2	3	4
1	Alwar	Rajgarh	2 (Bhangarh, Nil kanth Maha Dev)	2 (Rajgarh ka Kila, Badgujron ki Prachin Prasad)
		Alwar		6 (Rajprasad, Bala Kila, Musi Maharani ki Chhatra, Krishna Kund, Tripoliya, Fathe Jaung Gumbad)
		Tijara		4 (Bhrithari Gumbad, Khanjado ki Kabra, Kila Indore, Pathan ki Kabra)
2	Bharatpur	Bayana	7 (Akbar's Chhatra, Ancient Fort with its monuments, Jahangir's Gateway, Jhajri, Lodhi's Minar, Saraj Sad-ul-lah, Usha Mandir)	3 (Kale Khan Ka Makbara, Cggatri of twelve pillars, Cenotaphs in the way of Vijay Mandir Garh)
		Bharatpur	5 (Fateh Burj near Anah Gate, Fort walls gate and approach Bridge at the Chowburja and Ashtadhatu Gate, Jawahar Burj and Ashtadhatu Gateway, Moat surrounding the fort wall)	2 (Kishori Mahal's complete premises, Choburza/ Gadhi Khernkaran)
		Brahmawad	2 (Idgah, Islam Shah's gate)	
		Deeg	3 (Deeg Bhawans, Looted Gun, Marble Jhoola)	2 (Kila, Prachin Prasad Chhatta)
		Kaman	1 (Chaurasi Khamba Temple)	10 (Karneshwar Mahadev Ka Mandir, Akbar ke Kos Chinha, Lal Darwaja, Ancient Well, Well of Dharamraj, Shri Krishan Ke paad and Gau Charan Chinha Khasra No. 1 & 198, Temple of Kedar Nath, Bhojan Thalian and two Katore, Cave of Bhaurnasur and Swing, Prachin Prasad)
		Malah	1 (Ancient Mound)	
		Noh	2 (Ancient Mound, Colossal Image of Yaksha)	
		Rupbas	1 (Lal Mahal)	1 (Baldevji Ka Mandir)
		Weir		2 (Kila, Prasad Tatha Vatika)
		Satwas		1 (Temple of Surya)
		Sahsan		1 (Muslim Kabren and Sahale Khan ki Kabren)
		Gangour Soti		1 (Cenotaphs of Holkar)
		Kumher		2 (Jal Mahal, Prachin Prasad)
		Nadbai		1 (Mohammad Gauri ke Senapati ki Chhatra)

Source: Govt. of Rajasthan and SRP for Bharatpur



Table D-6.1.6- Protected Monuments in Haryana Sub Region, 2019

S. No.	District	Centrally Protected	State Protected
	1	2	3
1	Gurugram	NA	Shishmahal, Dehra Temple
2	Mahendragarh		Mosque of Pir Turkman and Tomb, Tripolia Gateway, Tomb of Shah Nizam, Chor Gombaj, Shobha Talav, Chatta Rai Bal Mukund Das, Throne of Mirza Ali Jaan and Baori

Source: <https://asi.nic.in/protected-monuments-in-haryana/>

Table D-6.1.7- Major Museums in NCR

Museum Name	Location	Specialty
1. National Museum of India,	Janpath, Delhi	Boasting of over 200,000 works of foreign and Indian art, this museum covers more than 5,000 years of worldwide rich cultural heritage. It is home to a plethora of departments such as archaeology, manuscripts, pre-history archaeology, paintings, arms and armour and much more
2. National Gallery of Modern Art	Jaipur House, Shershah Road, Delhi	Being a premier art gallery under the Ministry of Culture, Government of India; The National Gallery of Modern Art is one of the world's largest modern art museums to visit in Delhi with more than 14, 000 works by renowned and reputed Indian and foreign artists of worldwide fame.
3. National Handicrafts and Handlooms Museum	Pragati Maidan, Bhairon Marg, Delhi	One of the largest crafts museums in Delhi NCR. Museum is home to over 35, 000 distinctive pieces of craft; all of which reflect the amazing skills and craftsmanship of Indian craftsmen via embroidery, paintings, textiles and clay, wood and stone craft items.
4. National Rail Museum	Chanakyapuri, Delhi	Focusing mainly on India's rail heritage, the National Rail Museum has both outdoor and indoor exhibits with a toy train ride which allows visitors to cover the entire museum on regular days. Home to a fascinating collection of more than 100 real size exhibits of the Indian Railways, one can find displays of static and working models, historical photographs, antique furniture and signalling equipment in this best museum in Delhi.
5. National Museum of Natural History ⁵	Tansen Marg, New Delhi	An institution devoted to environmental education, displays a life size model of dinosaur in front of the museum. It introduces the visitors to natural history and ecology, having a large collection of stuffed animals and birds.
6. Gandhi Smriti	5 Tees January Marg, Delhi	Previously known as Birla House or Birla Bhawan, Gandhi Smriti is a museum in Delhi dedicated to Mahatma Gandhi. It is the very place where Mahatma Gandhi spent the last few months of his life and was then assassinated.
7. Nehru Memorial Museum & Library	Teen Murti Bhawan, Delhi	This institution aims to preserve, recollect and reconstruct history during India's struggle for independence. More than 2, 50, 000 printed books, 1, 50, 000 photographs and 8, 000 audio tapes reveal information on Nehru and the Indian freedom movement in this museum in Delhi NCR.
8. National Science Centre	Pragati Maidan, Bhairon Marg, Delhi	National Science Centre is part of NCSM or National Council of Science Museums and is the first and best museum in Delhi under this council. The entire exhibit spans over 4 floors and is extremely popular amongst students. Six permanent halls hold interesting exhibits which are a must-visit for all.
9. National Philatelic Museum		This museum is immensely popular and interesting. Operated by the Department of Post, the National Philatelic Museum is known for its amphitheatre, library and display of postage stamps. An area has also been dedicated for people to view artists at work. It has Post-independence era stamps & Philatelic workshops.
10. Metro Museum	Patel Chowk Metro Station, Delhi	This is one of the best museums in Delhi which is also quite unique in nature. It is South Asia's first modern metro museum which showcases the Delhi Metro along with the genesis, journey and history of DMRC or Delhi Metro Rail Corporation in details.

⁵Source: <http://letusgoto.com/2017/02/28/museums-in-delhi/>



Museum Name	Location	Specialty
11. Supreme Court Museum	Tilak Marg, Supreme Court, Delhi	The main aim of this museum in Delhi NCR is to preserve, display and protect extremely rare manuscripts, files, photographs, objects, artefacts and manuscripts which depict the nation's Justice Delivery System's legal growth and heritage.
12. Sangeet Natak Akademi Museum	Rabindra Bhawan, Delhi	Amongst all museums in Delhi, this one aims to preserve and promote performing arts in the nation and along with maintaining a museum, it also houses a gallery of musical instruments. Visitors can witness the rich heritage of performing arts from all over the nation.
13. Tribal Museum	Thakkar Bapa Smarak Sadan, Delhi	It showcases the diverse and fascinating tribal culture of the nation and aims to preserve some of its rare insights and artefacts. You will get a complete glimpse of the tribal way of life here along with several murals on the walls.
14. National Children's Museum	Kotla Road, Delhi	This is a unique educational museum in Delhi especially for children and is home to a plethora of jewellery, toys, dolls and musical instruments. It mainly aims to enhance creativity amongst children of all ages and also holds regular workshops and classes on creative arts.
15. Indian Air Force Museum	Palam, Delhi	This museum features a gallery containing historic memorabilia, photographs, personal weapons and uniforms of the Indian Air Force since its inception years ago. Visitors can also view a small aircraft, large aircraft and Air Force inventory here.
16. Shankar's International Dolls Museum	Nehru House, Delhi	Museum in Delhi was set up by K. Shankar Pillai, a political cartoonist. Home to around 6,500 dolls from more than 80 countries, this is a popular Museum amongst children and adults alike.
17. Sanskriti Museums ⁶	Mehrauli-Gurgaon Road, Anand Gram, Delhi	This museum is actually a set of three museums in Delhi which are the Textile Museum, Museum of Indian Terracotta and Museum of 'Everyday Art'. The diverse showcase of Indian Textile heritage and several objects related to terracotta art, figures and sculptures can be found in the first 2 museums respectively. In the last museum, visitors will find daily household objects being turned into pieces of art.
18. Archaeological Museum & Indian War Memorial Museum	Red Fort, Delhi	Set inside the Red Fort, the Department of Archaeology runs this museum. Built as an honour to soldiers who'd been part of WWI, this war memorial cum museum now houses dioramas and weaponry including guns, swords and khurkis. The last two galleries are super-impactful, showing the use of modern technology in war, which includes telephones, radios and periscopes. The Archaeological museum also has objects from the Mughal period on show.
19. Heritage Transport Museum	Tauru, Haryana	There is also a heritage museum in Tauru, Haryana, which attracts many vintage car lovers.

6. Key Issues & Challenges related to Development of Heritage, Culture & Tourism in NCR

- Despite having 1000-1500 monuments in and around Delhi, with places like Zahaaj Mahal, Jharna Mahal having 1000 years of history, they are not getting enough visitors. This potential is still to be exploited. Further, despite impressive range of its superb cultural, natural, and spiritual endowments and sharp increase in tourist arrivals in recent years, the region's share of world tourism remains insignificant.
- Connectivity Problems: NCR's connectivity is limited and focal to NCT Delhi, thus acting as a constraint to tourism growth in the region. There is only one major domestic and international airport at New Delhi thus restricting the air access within the NCT Delhi. The road connectivity to the destinations within the NCR is limited to the State and National Highways but not as effective last mile connections to the specific sites. In order to provide easy and quick access to these destinations within NCR, a tourist specific multi-modal transit

⁶Source: 25 OF THE MUST-VISIT MUSEUMS IN DELHI - <https://www.treebo.com/blog/museums-in-delhi/#respond>



facility should be planned ranging from Heli-services, NCR cab services, Tourist coach services, dedicated tourist suburban railway trains, etc.

3. **Inadequate Destination Infrastructure:** Utilities and civic services, such as water, sanitation and solid waste management are inadequate and do not provide safe and attractive environments for visitors. Lack of visitor information and interpretation facilities is limiting proper interpretation of the NCR's cultural heritage. There is an urgent need to improve the infrastructure and services in these sites most of which are National and State protected monuments.
4. **Lack of Product Identity:** The cultural and natural edifices/resources in the region seriously lack any product identity or brand identity. The experience of the visitors and tourists to these sites are fragmented. There are no blueprints for integration and management plan for the tourism resources of NCR. The delineation of theme based destination, circuit, trail and night halts need to be executed to determine the tourist experience and movement pattern within these sites in the region.
5. **Weak Heritage Protection and Destination Management:** The regions' enormous potential for tourism development is further constrained by inadequate institutional capacity and human resources of sector agencies to plan, develop, protect, and manage these cultural and natural heritage destinations and deliver quality tourist experiences.
6. **Lack of Host Community Participation:** The heritage sites in the region offer great potential for diversifying and spreading tourism benefits in the region. It is observed that there is a lack of tourism-related skills among the local populations and weak supply chain linkages between the local economy and tourism. Though there are immense opportunities to promote inclusive tourism and community tourism products in and around these cultural and natural sites through infrastructure development and special efforts for mobilizing communities to engage them in the tourism economy.
7. **Inappropriate Land-use and Circulation Patterns:** The current designated land uses in and around most of these sites of NCR have non compliant land-uses which dominate the character of the place. These land usage and the resulting services in return have started generating negative impact on the historic environment of the place. These development need to be regulated according to indigenous site conditions. Site to site assessment of its character and influence zones will determine the parameters of future development.
8. **Limited Private Participation:** Currently the private sector provides hospitality services, including accommodation, retail, and tour operations. Investments to improve connectivity and destinations, which are identified in close consultation with the industry, will induce private investments in complementary hospitality services.
9. **Synergy between Participating State Governments' Policies:** Policies of NCR participating States promote sustainable and inclusive development. Most of the tourism strategy documents of these participating State Governments affirm the need for the regional and cross state border tourism promotion, but it is imperative to develop a regional policy for better management and governance.
10. **Regional Cooperation in Tourism:** The participating State Governments and State tourism departments jointly need to carve out a niche market with tapping of potential synergies of tourism endowments available in the region. The participating tourism nodal agencies need to work together and promote tourism in the region. There is the need of convergence of individual state tourism strategies/policies/development plans and adopt a single framework for operation of tourism activities within the NCR.
11. **Towards Joint Development of Infrastructure:** There is a need for NCR participating States commitment to joint development of infrastructure along defined multi-state circuits that combine complementary state assets into marketable regional tourism products.
12. **Commitments for Tourism Development:** The vision of NCR tourism goals requires commitments from the participating states mainly focused on protection, development planning and promotion of the natural and cultural resources available in the NCR.



Annexure-D-6.1.1

SCHEMES & INITIATIVES OF GOVERNMENT OF INDIA, TOURISM & HOSPITALITY SKILL COUNCIL AND NCR PARTICIPATING STATES

A) Brief of Schemes & Initiatives of Government of India and Tourism & Hospitality Skill council

1. Govt. of India has taken various initiatives for the development of tourism sector. Major Schemes of Union Ministry of Culture includes (a) Safeguarding the Intangible Cultural Heritage and Diverse Cultural Traditions of India⁵; (b) Financial Assistance for Promotion of Art and Culture - under this scheme Ministry provides financial assistance to dramatic groups, theatre groups, music ensembles, children theatre and for all genres of performing arts activities⁶; (c) Financial assistance for promotion and strengthening of regional and local museums; (d) Pension and Medical Aid to Artistes; (e) “Certificate of Excellence” Scheme for Museum Professionals, amongst others.
2. Ministry of Tourism has also taken up initiative of identification, diversification, development and promotion of niche tourism products of the country like, Adventure, Medical, Wellness, Golf, Polo, Meetings Incentives Conferences & Exhibitions (MICE), Eco-tourism, Film Tourism, Sustainable Tourism, Cruise, etc. to overcome ‘seasonality’ challenge in tourism and to promote India as a 365 days tourist destination⁷
3. India’s built heritage are well-protected by Article 49 of the Constitution: “It shall be the obligation of the State to protect every monument or place or object of artistic or historic interest, (declared by or under law made by Parliament) to be of national importance, from spoliation, disfigurement, destruction, removal, disposal or export, as the case may be.” Further, Article 51 A (f) states: “It shall be the duty of every citizen of India to value and preserve the rich heritage of our composite culture; and (g) to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures.”⁸
4. According to the **Ancient Monuments and Archaeological Sites and Remains Act 1958**, “Ancient Monument means any structure, erection or monument, or any tumulus or place of interment, or any cave, rock-sculpture, inscription or monolith, which is of historical, archaeological or artistic interest and which has been in existence for not less than 100 years and includes – remains of an ancient monument, site of an ancient monument, such portion of a land adjoining the ancient monument as may be required for fencing or covering in or otherwise preserving the monument and the means of access to, and convenient inspection or, an ancient monument.” The protection of the heritage sites in India is overseen by the Archaeological Survey of India, which functions under the Ministry of Culture. The Ancient Monuments and Archaeological Sites and Remains Act 1958, updated as The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010 provides for the protection of heritage sites, monuments, archaeological sites, sculptures and other objects which have historical value and importance.⁹
5. **The ‘Adopt A Heritage: Apni Dharohar, Apni Pehchaan’¹⁰**, scheme launched on 27th September, 2017 is a collaborative effort by Ministry of Tourism, Ministry of Culture and Archaeological Survey of India (ASI), State/UTs Governments and envisages development and maintenance of tourist amenities at heritage sites and making them tourist friendly, to enhance tourism potential and cultural importance in a planned and phased manner. The project primarily focuses on providing basic amenities that include cleanliness, public conveniences, safe drinking water, ease of access for tourists, signages, illumination, Wi-fi etc. No fund is given by Ministry of Tourism. The Project envisages involvement of Private/Public Companies / Organizations

⁵<http://www.indiaculture.nic.in/scheme-safeguarding-intangible-cultural-heritage-and-diverse-cultural-traditions-india>

⁶Source: <http://www.indiaculture.nic.in/scheme-financial-assistance-promotion-art-and-culture>

⁷Indian Tourism Infrastructure - Investment Opportunities & Challenges-FICCI <http://ficci.in/spdocument/23099/FICCI-report-TIM-2019.pdf>

⁸https://www.orfonline.org/research/protecting-indias-built-heritage-against-natural-disasters-50592/#_edn1

⁹Ehtesham Patel, *Conservation of Heritage Sites in India* - <https://www.ijeat.org/wp-content/uploads/papers/v6i5/E5080066517.pdf>

¹⁰<https://pib.gov.in/newsite/PrintRelease.aspx?relid=186491>



and Individuals to adopt Monuments, Natural Heritage Sites and other Tourist Sites in the country, primarily under CSR.

The Memorandum of Understanding (MoU) signed specifies installation of one signage at the monument indicating that monument has been adopted by respective firm/organization.

Providing basic facilities/amenities (e.g. drinking water, toilet blocks, facilities for physically challenged, pathways, cultural notice boards/signage, vehicle parking, cloak rooms, etc.) to tourists visiting centrally protected monuments and sites are the regular activities which the Archaeological Survey of India undertakes. Improvement and upgradation of these public facilities/amenities is a continuous process. Basic public facilities are available at all World Heritage Sites and ASI's ticketed monuments, as also at majority of those protected monuments that are visited by a large numbers of tourists. Further, Archaeological Survey of India has identified 100 monuments as "Adarsh Smarak" for upgradation of existing facilities/amenities like Wi-Fi, cafeteria, interpretation centre, brail signage, modern toilets etc. on the basis of actual requirement and feasibility on case to case basis.

6. **The National Heritage City Development and Augmentation Yojana (HRIDAY)¹¹**, a central sector scheme of the Government of India, was launched on 21st January 2015 with the aim of bringing together urban planning, economic growth and heritage conservation in an inclusive manner & with the objective of preserving the heritage character of the City. Under the Scheme, twelve cities namely, Ajmer, Amritsar, Amaravati, Badami, Dwarka, Gaya, Kanchipuram, Mathura, Puri, Varanasi Velankanni, Warangal have been identified for development. The mission period of HRIDAY scheme ended on 31st March, 2019.

The Scheme has supported development of core heritage linked civic infrastructure projects which includes revitalization of urban infrastructure for areas around heritage, religious, cultural and tourism assets of the cities. Scheme emphasized on the accessibility, security, safety, livelihood, cleanliness and faster service delivery in the heritage cities. The initiatives include development of water supply, sanitation, drainage, waste management, approach roads, footpaths, street lights, tourist conveniences, electricity wiring, and landscaping and such citizen services. However, the scheme ended in 2019 and none of NCR cities were part of the scheme, it would be imperative to consider guidelines of the scheme to develop some selected historical areas on similar lines.

7. **Pilgrimage Rejuvenation and Spirituality Augmentation Drive (PRASAD)¹²** : PRASAD Scheme, was for integrated development of pilgrimage destinations in planned, prioritised and sustainable manner to provide complete religious tourism experience, it focuses on development and beautification of identified pilgrimage destinations.
 1. Introduced in 2015, the Pilgrimage Rejuvenation and Spiritual Augmentation Drive (PRASAD) is a government scheme that focuses on identifying and developing the pilgrim sites across the country to enrich the religious tourism experience.
 2. It was launched by Union Ministry of Tourism and to implement the PRASAD scheme a Mission Directorate has been set up in the Ministry.
 3. It aims at integrated development of pilgrimage destinations in planned, prioritised and sustainable manner to provide complete religious tourism experience.
 4. The scheme has following Objectives:
 - a) Harness pilgrimage tourism for its direct and multiplier effect upon employment generation and economic development.
 - b) Enhance tourist attractiveness in sustainable manner by developing world class infrastructure in the religious destinations.
 - c) It also seeks to promote local art, culture, handicraft, cuisine, etc.

¹¹Source: *HRIDAY Guidelines* - <http://mohua.gov.in/upload/uploadfiles/files/Guidelines%20HRIDAY.pdf>

¹²Source: *PRASAD Scheme Guidelines* - http://tourism.gov.in/sites/default/files/Scheme%20Guidelines_8.pdf



5. The development of infrastructure under PRASAD Scheme includes the development of lighting and illumination with renewable energy sources, eco-friendly modes of transport, first aid centres, drinking water, waiting rooms, toilets, parking, craft bazaars/souvenir shops/haats/cafeteria, rain shelters, telecom facilities, internet connectivity etc.
6. Development of basic tourism facilities like road, rail and water transport, last-mile connectivity, like Information and interpretation centers, Money exchanges and ATMs
7. **Funding:** Under it, Ministry of Tourism provides 100% Central Financial Assistance (CFA) to State Governments.
8. **Swadesh Darshan:** Swadesh Darshan Scheme is launched for integrated development of theme based tourist circuits in the country. This scheme is envisioned to synergise with other schemes like Swachh Bharat Abhiyan, Skill India, Make in India, etc. with the idea of positioning the tourism sector as a major engine for job creation, driving force for economic growth, building synergy with various sectors to enable tourism to realise its potential¹¹ Scheme for Integrated Development of Theme-Based Tourist Circuits in the Country. Ministry of Tourism, Government of India is making sincere efforts to increase the number of foreign tourists visiting India. To address issues like Quality infrastructure, sustainable development and awareness about the tourist spots various schemes like Swadesh Darshan, etc. has been launched. This scheme is envisioned to synergise with other Government of India schemes like Swachh Bharat Abhiyan, Skill India, Make in India etc. with the idea of positioning the tourism sector as a major engine for job creation, driving force for economic growth, building synergy with various sectors to enable tourism to realise its potential.

An illustrative list of components that would be eligible for Central Financial Assistance under the scheme is given below:

- 8.1. Tourism Related Services
- 8.2. Tourism Related Infrastructure
- 8.3. Tourism Mapping, Management & Online Presence
- 8.4. Capacity Development, Skill Development & Knowledge management
9. **Development of Iconic Tourists sites.**
 - 9.1 Seventeen (17) sites are developed across the country including 3 sites in Delhi (i.e Humayun's tomb Red Fort, Qutub Minar)
 - 9.2 looking for overall change in experiences for tourist in terms of infrastructure, facilities, branding, events so that when people spend more time while visiting these places.
 - 9.3 Pragpur is a village in Himachal Pradesh which notified as a "Heritage Village" by the State Government in Dec. 1997. This Village is well maintained and attracts many tourist.
10. **Development of Infrastructure:** Developing special tourist zones with 300 acres of land parcels based on smart cities models. State government to come up with proposals for public infrastructures, covering proper electricity, water supply, connectivity, and also bring private investment.
11. IRCTC, a subsidiary of the Indian Railways, is contributing to tourism promotion by offering its products ranging from budget package, budget train & Luxury Train. In NCR, IRCTC is promoting Delhi Mega Darshan project.
12. 24×7 Tourist helpline which is Toll Free Multilingual Tourist Info Line (1800111363 or on a short code 1363) is being run by the Ministry of Tourism in 10 International. Languages besides Hindi & English for providing information relating to Travel & Tourism in India to the domestic and International tourists to assist them while travelling in India.
13. **Scheme for "Safeguarding the Intangible Cultural Heritage and Diverse Cultural Traditions of India"**- India has a vast basket of living and diverse cultural traditions, traditional expressions, intangible cultural



heritage comprising masterpieces which need institutional support and encouragement with a view to addressing areas critical for the survival and propagation of these forms of cultural heritage. Though, such preservation efforts are being carried out in a scattered form, a need is being felt to have an institutionalized and centralized Scheme for concerted efforts in the direction of professionally enhancing awareness and interest in Intangible Cultural Heritage (ICH), safeguarding, promoting and propagating it systematically.

For this purpose, the Ministry of Culture has formulated a Scheme titled “Scheme for Safeguarding the Intangible Heritage and Diverse Cultural Traditions of India”, with the objective of reinvigorating and revitalizing various institutions, groups, individuals, identified non-MOC institutions, non-government organisations, researchers and scholars so that they may engage in activities/ projects for strengthening, protecting, preserving and promoting the rich intangible cultural heritage of India.

14. **Museum Grant Scheme¹³** - to provide financial assistance for setting up of new Museums by State Governments and Societies, Autonomous bodies, Local Bodies and Trusts registered under the Societies Act, to strengthen and modernize the existing museums at the regional, state and District level, digitization of art objects in the museums across the country for making their images/catalogues available over the website and for capacity building of Museum professionals.
15. **Pension and Medical Aid to Artistes¹⁴** - meant for improving the financial and socio-economic status of the old artistes and scholars who have contributed significantly in their specialized fields of arts, letters etc. in their active age or are still contributing in the field of arts, letters etc. but due to old age they have to lead a miserable life or are in penury condition. The Scheme also envisages to provide medical aid facility to these Artistes and his/her spouse by covering them under a convenient and affordable Health Insurance Scheme of the Government for treatment of diseases involving hospitalization through an identified network of health care providers. This Scheme has following two provisions/components:-
 - A) National Artistes Pension Fund and
 - B) National Artistes Medical Aid Fund
16. **“Certificate of Excellence” Scheme for Museum Professionals¹⁵** - The objective of the Scheme is to acknowledge the achievements made by the employees of the Museums in order to encourage them to work hard in the pursuit of excellence.
17. **Tourism & Hospitality Skill council (THSC)** formed in 2014, is autonomous Society by CII, and hence an Industry body created of and for the Industry, to acts as standard Platform to Connect Industry, Government, Skill Partners and Students.
 - i) THSC works under the leadership and ambit of Ministry of Skill Development and Entrepreneurship. Its Vision is to **create a robust industry aligned eco system by promoting Hospitality and tourism sector skill development**, benefitting millions in India to get respectable employment opportunities for serving the customers and other stake holders
 - ii) **Sub Sectors of THSC**; include hotels, tourism, food services, facilities management and cruise liners
 - iii) **Benefit working/Collaborating with THSC**
 - Apprenticeship Program under NAPS.
 - Students would get Government Recognized Skill Certificate on NSQF level.
 - Industry approved National Standards (Qualification Packs) and Curriculum.
 - Placements Opportunity with best in Industry.
 - Training of Trainer (TOT) program aligned to Ministry of Skill Development guidelines and certified by NSDC.

¹³<http://indiaculture.nic.in/museum-grant-scheme>

¹⁴<http://www.indiaculture.nic.in/scheme-pension-and-medical-aid-artistes>

¹⁵<http://www.indiaculture.nic.in/certificate-excellence-scheme-museum-professionals>



- Assessment through Online application with minimum intervention of the Assessor.
- Employees with no certification can get Skill Certified under Recognition of Prior Learning (RPL).

iv) Benefits to Employer / Establishments

- Apprenticeship will reduce attrition rate as you Train your staff according to your job role.
- Apprenticeship reduces your manpower cost in long run as it gives you better returns.
- No ESI / No PF obligations for keeping apprentices in your establishments.
- Once Apprentice is trained, their future manpower needs will be fulfilled within organisation.
- Employer will get 25% of prescribed stipend subject to a maximum of Rs. 1500/- per month per apprentice to all apprentices with the employers. Online submission of reimbursement is available on portal. Also can avail benefits up-to **7500/- for BTP** per apprentice for fresher candidates.

18. Brief of Initiatives of NCR participating States

18.1 Heritage and Tourism in Haryana- A brief

- i) **Objectives of the Heritage Tourism Policy are to position Tourism as a State priority** and identify it as a growth engine for employment generation. Cultural Heritage is a major economic activity and a catalyst for employment generation and is projected to grow even faster in the 21st Century.
- ii) State aims at harnessing the direct and multiplier effects of tourism in employment generation in an environmentally sustainable manner. **The effort would be to promote untapped areas of Heritage, Ecological, Rural Tourism** in order to promote large scale employment opportunities while protecting environment and culture.
- iii) Broadly, the policy document attempts to provide constructive value in diverse fields such as to :
 - Promote Heritage tourism as a major engine of economic growth and capitalize potential of sustainable tourism for economic and employment generation.
 - Promote Haryana as a tourist destination to take advantage of the global travel exchange and to develop untapped potential of Haryana.
 - Acknowledge the critical role of private sector in development of tourism with government working as proactive facilitator and catalyst.
 - Enhance the infrastructure of heritage in grass root level i. e. emphasis on local art, craft, ethno archaeological traditions to involve local community, artisans, and professionals.
 - Enhance professional excellence in training human resources and providing infrastructure for Human Resource Development.
 - Developing sustained and effective marketing strategy and plan.
- iv) The Department of Archaeology & Museums, Haryana has an array of sections that sustain and promote the archaeological heritage of Haryana. State protected monuments are being maintained under “The Punjab Ancient Historical Monuments and Archaeological Sites and Remains Act, 1964.”
 - Department has 6 plan schemes that include
 - Archaeological Excavation/Exploration Programme
 - Publication/Publicity Programme (Site information brochures, Collection catalogues and similar souvenirs that can be used as promotional media and education aids for different groups, plan to publish Atlas of Harappan sites in Haryana, Coffee table book on Heritage Sites in Haryana and research related books that will cater to researchers, tourists, students, educators and academicians alike)
 - Protection/Preservation & Development of Ancient Monuments/Sites
 - Preparation of Plaster Casts and Antiquities (objects carefully selected from the collection of artefacts representing the vast history of art of Haryana and replicas are made manually with great skill. Beside



this the replicas are prepared for display in exhibitions and to give to other museums and different DC offices in free of cost. Department has proposed creation of Heritage Corners in various Schools across the State in order to sensitize youth to the Precious Heritage that is irreplaceable)

- Setting up of Archaeological Museum (ongoing projects include Site Museum and Interpretation Centre at Rakhigarhi; State Archaeological Museum, Panchkula)
- Setting up of Zonal Museum
- The Department is also initiating the project to upgrade the Museums under its protection. At present there are six zonal museums namely (a) **Jahaj Kothi, Hisar**; (b) **Jayanti Archaeological Museum, Jind**; (c) **Guru Tegbahadur Samarak Museum, Barh Khalsa, Rai, Sonapat** ; (d) **Guru Govind Singh Martial Art Museum at Kapalmochan, Yamuna Nagar** ; (e) **Deen Bandhu Sir Chhotu Ram Smarak Museum, Rohtak** ; (f) **Battle of Panipat Museum, Panipat**.
- v) Heritage Tourism started in Haryana in 1970s, with the concept of highway tourism, as we have very good amenities alongside the highways. E.g travel from Delhi to Ambala, one finds shops at Murthal Dhaba, which are often frequented by people from Delhi. Now moved from highway tourism to heritage tourism. Krishna circuit is being looked after by Kurukshetra Development Board. (place with circumference of 48 kose with visitors taking parikrama of these sites) . Area can be developed as Mahabharata circuit as it is the place where epic battle of Mahabharata was fought on the land of Haryana.
- vi) Tourism Department and Department of Archaeology & Museums are into development of Saraswati river valley civilization where paleo channels are visible in satellite imageries whereas earlier due to tectonic movement river shifted the course. The point is called *Aadi badri* counterpart of Haridwar. *Saraswati River* flows from Himalaya to Haryana towards Rajasthan and falls to Arabian sea. It is believed that sages use to do meditation here and wrote all the four *vedas*. Archaeology excavation are going on alongside of the river and many antique pieces has been excavated and are kept on display in national Museum. *Rakhigarhi* and *Kunal* are two such sites in Haryana.
- vii) Government is planning to build regional connectivity at Hisar which is hub of heritage site.
- vii) Few more rail Lines are planned in PPP mode with partnership with Indian railways and Government of India.

18.2 Heritage and Tourism in NCT Delhi - A brief

- i) Delhi Tourism Department is focusing on this aspect by **initiating series of festivals**. Idea is to tell stories of lesser known monuments and create spark so that more people visit these places.
- ii) List of festivals organized include
 - *Mehrauli as Phool Walon Ki Sair* it started in 18th century during *Mugals time*.
 - *Jahaaz mahal* beside beautiful lake *shamshi lake*.
 - In Mehrauli, we have Dargah of Sufi *hazarat kutubdin mukhtyar kakib* ,the first sufi saint who visited the Delhi
 - Mohammad Qutub sahib's dargaah then *Hazrat Roshan chirag* at Chirag Delhi
 - Dargah of *Hazrat Nizammudin*.
 - *Mehruli Mansoon festival* which includes cultural program, arts and craft mela and heritage walk. And **Archival walk** which displays many information about
 - *Shahpur Jat festival*, Shahpur is a designer village. It has got lot of boutique.it is a Khilji and Tughlak era places
 - *Hauz Khas festival* is in pipeline
- iii) Other **initiatives** taken up by Delhi Tourism Department are as under:
 - To **popularise Neighbourhood monuments** so that neighbourhood community can be benefitted by it.
 - To have **food joints with local delicacies**.



- We are also working on reviving Hop on Hop Off (HOHO) service.
- Concept of **adoption of monument**. Corporate entity is taking care of one monument and they have interpretation centre.
- **Walk guide for Mehrauli and archaeological park.**
- Involving local community in local eateries, old houses are also open for visits as they have collection of little things like coins etc. (similar arrangements existing in old Delhi which is run by few NGOs)
- **Parks and garden are used as cultural programme for raga performances.**
- **“MLA fund for cultural performances”** MLAs has been given a fund of Rs. 25 lakhs to organise cultural programmes of their preferences or as per the desire of the people of respective constituency.
- Delhi Tourism department has **extensively conserved many lesser known monuments which were encroached by local people.**
- In Delhi Archives, a lot of information and photographs of all the famous monuments and lesser known monuments are available. All this information is available on website and can be browsed by any interested person.
- **Mobile based app to be launched soon** where people can have information about any monument, and it will have inbuilt calendar about the events that Tourism department has planned.
- **Darashaw library has been conserved** and plans to have archaeological Museum as we have many artifacts to display. Even railway department in Malkhana has many things to display
- **Museum of partition** in line with museum of partition of Amritsar is another project Delhi Tourism is working on.
- Major initiatives taken by Department of Archaeology, GNCTD regarding conservation of Monuments included:
- Baoli at sector 12, Dwarka; Tomb & Enclosure Wall (behind Mehrauli Bus Terminus); Azimganj Sarai, Delhi Zoo; Gol gumbad; Chemical Cleaning at Tomb of MOHD. Quli Khan
- Bara lao ka gumbad; Bijri Khan’s Tomb; Mutiny Memorial; Tomb Lado sarai

18.3 Rajasthan Tourism Scenario

- i) Foreign Tourist Visits (2018)-17.54 Lacs, Domestic Tourist Visits (2018)-502.36 Lacs, Share of Trade and Tourism in State GDP-14.02%, Number of classified & unclassified Hotels & PG Houses (as on 31.03.2019)-3296, Number of Total Rooms (as on 31.03.2019)-65,902, New Tourism Projects approved in 2018-19-167, Forts & Palaces-19
- ii) Bharatpur has 15 monuments and tourists spots out of which 08 has been curated
- iii) Luxury Train- Palace on Wheels (POW)
- iv) Fairs & Festivals 13 Internationally known festivals- Pushkar Fair, Desert Festival, Holi Festival, Kite Festival, Camel Festival
- v) Time bound
 - a. **Single Window Clearance for Film Shooting** under Rajasthan Film Shooting (Amendment) Regulations, 2016
- vi) Heritage Hotels in Rajasthan
- vii) **Old palaces converted by owners into Heritage Hotels** as early as later part of 1950’s (Rambagh Palace Hotel in Jaipur, Lake Palace in Udaipur and Umaid Bhawan in Jodhpur were the first of these hotels)
- viii) Conversion of **old Forts, Palaces and Havelis into Heritage Hotels** on a large scale began in 90’s. Strengths of Heritage Hotels:
 - a) Quality accommodation and Royal experience to tourists, Theme Wedding Destinations, Exotic sets for Film Shooting, Every Heritage Hotel is a Unique Experience, Ethnic Culinary Experience
- ix) Diverse Experience– **Safaris, Eco Tourism, Heritage Walks, Local Culture, Traditional Art forms** etc.



Annexure-D-7.1

7. WATER, DRAINAGE AND SANITATION

Snapshot of water scenario of NCR, especially regarding urban water supply, ground water table and unaccounted for water, etc.

1. DJB had considered per capita potable water requirement @ 60 GPCD. Water demand for population of 23 million @ 60 GPCD works out to 1380 MGD (6265 MLD) (refer **Annexure D-7.2**). This does not include requirement for horticulture/gardening/agriculture and industrial process water. However, present estimated population for NCT of Delhi is 21 million and water requirement @ 60GPCD works out to 1260 MGD. Present production of potable water by Delhi Jal Board is about 935 MGD including 90 MGD from ground water resources. About 93% of population is covered by piped water supply network in Delhi, including through public hydrants in JJ clusters. Given the limited availability of raw water to Delhi, water demand of potable water for domestic use needs to be rationalized and progressively reduced to 50 GPCD (225 LPCD) by use of non-potable recycled water of desired quality standard for non-drinking purposes like toilet flushing etc. Water demand for industrial process & horticulture/gardening/agriculture purposes will need to be necessarily met out from recycling of waste water of desired quality standards.
2. Since Dual Piping infrastructure for use of non-potable water in toilet flushing is very difficult and highly cost intensive to implement for the existing urban developments, therefore potable water demand for new development is to be considered @ 40 GPCD to reduce potable water requirement @ 50 GPCD at the city level.
3. In order to promote the use of treated effluent for non-potable purposes, such as irrigation, horticulture, power plants, water bodies, etc. The DJB has installed filling points for treated effluent at almost all WWTPs. The Biochemical Oxygen Demand (BOD) stands at ≤ 20 ppm and the Total Suspended Solids (TSS) stands at ≤ 30 as well, making it usable for non-potable purposes. The DJB conducted workshops with a number of government agencies such as DMRC, PWD, NDMC, SDMC EDMC, NTPC, Indian Railways (for their wagon and carriage washing) and others, encouraging them to use treated effluent. The DJB is making efforts to return 267 MGD of treated effluent in river Yamuna as a return flow in terms of Yamuna water allocation, which is to be utilized by other riparian states as per their allocation of Yamuna water at Okhla headworks. Presently DJB is supplying 90 MGD of treated effluent and its utilization is likely to be increased in a phased manner.
4. Total water demand for the NCR in 2031 has been estimated to be about 10,389.58 million litres per day (MLD), which is likely to rise to 13,399.42 MLD in 2041. In order to meet the rising water demand, the NCR requires sustainable water resources. However, to the extent of 53% of its water needs, the NCR depends on water resources located outside of the region. For another 47%, the NCR depends on ground water for water supply in urban areas of the NCR.
5. In the Uttar Pradesh (UP) Sub-region, dependency on ground water for urban water supply is very high (86 percent) followed by urban areas of the Rajasthan Sub-region where it is 54 percent (**Table D-7.1.1**). However, the Rajasthan Sub-region has experienced greater change in ground water table than the Haryana Sub-region (**Table D-7.1.2**).
6. Delhi urban area coverage of water supply is the highest (93% percent through piped water supply and rest through tankers) whereas Rajasthan Sub-region has the lowest urban water supply coverage (73.9 percent). There is a need to ensure 100 percent water supply coverage at the rate of 135 LPCD water to all urban residents in all sub-regions (**Table D-7.1.3**). Coverage and service level of water supply in rural areas of the NCR is also below acceptable norms of 70 LPCD with 100 percent coverage. The U.P. Sub-region has the lowest water supply coverage of 42 percent and Rajasthan Sub-region has the lowest service level of 34 LPCD against a standard of 70 LPCD (**Table D-7.1.3**).



7. The unaccounted-for water (UfW) is high in urban areas of the NCR (**Table D-7.1.4**) with the highest in Delhi around 46 percent, which is much higher than the norm of 15 percent prescribed by the Ministry of Housing and Urban Affairs. Unlike the NCT of Delhi, UfW is close to prescribed limit in the Haryana Sub-region (15 percent). For sustainable water management, a standard of less than 15 percent of UfW is regarded desirable. Other parameters of service level benchmarks are not achieved in all sub-regions of the NCR (**Table D-7.1.5**). Initiatives to be taken to achieve these benchmarks for water supply in all sub-regions of the NCR.
8. The NCR has insufficient number of water treatment plants. A total number of towns without water treatment plants (WTPs) are 94 and only 31 towns have water treatment plants (WTP) (**Table D-7.1.6**). Number of towns without WTPs is the highest in the UP Sub-region (75) followed by the Rajasthan Sub-region (11). Data from states indicated that there are no water treatment plants in the Districts of Hapur, Muzaffarnagar, Shamli and Alwar. To ensure better water quality, investment in building new water treatment plants (WTPs) becomes one of the major challenges.

Table D-7.1.1: Sources of Urban Water Supply, 2019

S. No.	Sub Region	Ground Water Sources (Tube well/ Ranney well)		Surface water source		Total
		In MLD	Percent share	In MLD	Percent share	
1.	Delhi	409	9.6	3836.00	90.40	4245.00
2.	Haryana	513.82	40	763.85	60	1,277.67
3.	Uttar Pradesh*	1357.6	86	213.00	14	1,570.00
4.	Rajasthan	64.36	54	55.60	46	119.96
5.	NCR	2344.78	32.50	4,868.45	67.49	7212.63

Source: Delhi Jal Board, 2019-20; NCR Planning and monitoring Cell, Haryana and UP, 2019-20; PHED, Government of Rajasthan (2019) and SPA Delhi

Note: 2013 data of GB Nagar district in Uttar Pradesh

Table D-7.1.2: Average Change in Ground Water Table in the NCR, 2012-2018 (in meters below ground level)

S. No.	Sub Region	Average depth of water table in 2012	Average depth of water table in 2018	Change in Water Table (2012-2018) (Meters below ground level)
1.	Delhi	13.32	15.23	-1.91
2.	Haryana	17.25	22.32	-5.08
3.	Uttar Pradesh	14.17	17.36	-3.19
4.	Rajasthan	19.95	25.64	-5.69

Source: CGWB, 2019-20; NCR Planning and monitoring cell, Haryana and UP; Ground Water Department, Rajasthan.

Note: Excluding Faridabad, Gurugram, Panipat, and Rewari in Haryana and GB Nagar district in Uttar Pradesh.

Table D-7.1.3: Water Supply Coverage and Service Level in Urban and Rural Areas of the NCR, 2019

S. No.	Sub Region	Percent Water Supply Coverage in Urban Areas of the NCR	Service Level of Water Supply in Urban Areas (as per CPHEEO is 135 LPCD) in LPCD	Percent Water Supply Coverage of Population in Rural Areas	Service Level of Water Supply in Rural Areas of NCR (as per CPHEEO is 70 LPCD) in LPCD
1.	Delhi	100	189.27	-	-
2.	Haryana	86.86	133.63	85.54	65.30
3.	Uttar Pradesh	80.47	128.97	42.05*	61.46*
4.	Rajasthan	73.94	68.39	81.235	34.15

Source: Delhi Jal Board, 2019-20; NCR planning and monitoring cell, Haryana and UP, 2019-20; PHED, Government of Rajasthan, 2019-20.



Table D-7.1.4: Sub-region Wise Unaccounted for Water¹ (UfW) in Urban Areas of NCR, 2019

S. No	Sub Region	Actual Water Supply (MLD)			Actual Water Generated (MLD)			Estimated Water Loss (UfW) in MLD (percent loss)
		Urban	Industrial	Total	Urban	Industrial	Total	
1.	Delhi		3,596	3,596			3,596	1,875 (46)
2.	Haryana	905.04	184.55	1,089.59	1040.41	237.5	1,277.91	189.38 (15)
3.	Uttar Pradesh*	1,191.03	2.20	1,193.23	1326.22	2.5	1,328.72	135.86 (10)
4.	Rajasthan	104.81	3.45	108.26	116.44	3.5	119.94	10.06 (10)
5.	NCR	-	-	6,459.08	-	-	6,794.57	2,210.31

Note: Excluding GB Nagar District*

Source: Delhi Jal Board, 2019-20; NCR Planning and Monitoring Cell, Haryana and UP, 2019-20; PHED, Government of Rajasthan, 2019-20

Table D-7.1.5: Sub Region Wise Status of Service Level Benchmarks in Urban Areas, 2019

S. No.	Sub Region	Percent Water supply coverage of population	Actual service level of water supply (LPCD)	Extent of NRW (in %)	Extent of Metering (in %)	Continuity of Water supply services (in Hrs.)	Efficiency in redressal of customer complaints (in %)	Quality of Water Supplied (in %)	Cost Recovery in water supply services (in %)	Efficiency in Collection of Water Charges (in %)
		100		15	100	24	95	100	100	90
1.	Delhi	93	202	43	92.00 65.00	Intermittent water supply 3-8 hrs	73	99	70	80
2.	Haryana*	86.86	133.26	16.77	63.89	15.28	84.12	98.71	63.05	72.78
3.	Uttar Pradesh**	80.47	128.97	13.02	1.50	10.02	87.57	97.62	54.46	66.46
4.	Rajasthan	73.94	68.40	14.68	54.47	24.00	76.69	93.33	41.59	75.19
5.	Total NCR***	80.42	133.16	21.87	46.22	13.83	80.35	97.17	53.03	73.61

*Note 1: It excludes Faridabad, Karnal and Mahendragarh Districts due to non-availability of data.

** Note 2: Information regarding "Extent of metering" are available for few towns of UP Sub Region.

*** Note 3: Excluding Delhi sub region for data related to Continuity of water supply services which is not available

Table D-7.1.6: Status of WTPs in Urban Areas of the NCR, 2019

S. No	Region and Sub-Region	Number of Towns with WTPs	Number of Towns without WTPs
1.	Delhi	1	0
2.	Haryana	20	8
3.	Uttar Pradesh	8	75
4.	Rajasthan	3	11
	Total NCR	31	94

* Excluding Faridabad, Jind, Karnal, Palwal, Panipat Districts

Source: NCR Planning and Monitoring Cell, Haryana and UP, 2019-20; Government of Rajasthan.

¹The data from the NCR States has been received but it is incomplete. The same will be updated once received from the NCR States.



Annexure-D-7.2

WATER SUPPLY OF NCT DELHI THROUGH DJB

1. The total area of the National Capital Territory of Delhi (NCT of Delhi) is about 1483sqkm. As per 2011 census, the population of Delhi was 167.88 lakhs. DDA had projected population of 230 lakhs for the year 2021.
2. Delhi Jal Board is responsible for treatment, supply and distribution of water in Delhi. Functions of Delhi Jal Board also include collection, treatment and proper disposal of sewage. Bulk Supply of water is made for the areas under the jurisdiction of New Delhi Municipal Council, Delhi Cantonment Board/Military Engineering Services and Delhi Development Authority for further distribution by these authorities.
3. Fresh water resources for the National Capital are limited and the situation is increasingly becoming challenging on the supply-demand matrix. On the supply side, Delhi is constrained by its very limited sources of river water, which is totally predicated by inter-state river water allocation agreements and their implementation. Ground Water Resources are severely restricted due to its small geographical area of 1483sqkm, which are already over stressed. On the demand side, Delhi is buffeted by one of the highest population density in the country with continuous in-migration of people from across the country, which is on a rising trend, resulting in continuous increase in demand of potable water for domestic use.

4. Present Water Supply Scenerio:

There are 09 water treatment plants as detailed here under and about 4400 numbers of tube-wells across Delhi, which are being operated by Delhi Jal Board for supply of potable water meeting the standards as per BIS 10500-2012. Present optimum production is about 935MGD including about 90MGD from ground water resources.

Table D-7.2.1: Name of WTP, Optimum production in (MGD) and Source of Raw water supply across Delhi.

S.No	Name of WTP	Optimum Production (in MGD)	Source of Raw Water Supply
1	Sonia Vihar	142	Upper Ganga Canal
2	Bhagirathi	114	Upper Ganga Canal
3	Chandrawal I&II	94	Wazirabad Pond
4	Wazirabad I,II & III	134	Wazirabad Pond
5	Haiderpur I&II	228	Delhi Branch/ CLC Munak Canal
6	Nangloi	42	Delhi Branch/ CLC Munak Canal
7	Okhla	21	Reclaimed water from Chandrawal Recycling Plant and Water from Ranney- Wells/ CLC Munak Canal
8	Bawana	20	CLC Munak Canal
9	Dwarka	50	
	Production from WTPs	845	
10	Ranney wells & Tube-wells	90	Sub- surface water
	Total	935*MGD	*Including production of recycling plants at WTP

5. Production of 595MGD (610 MGD raw water less about 3% treatment losses) at seven water treatment plants (Wazirabad, Chandrawal, Haiderpur, Nangloi, Dwarka, Bawana, and Okhla) is dependent on conveyance of river water (Ravi - Beas water from BBMB and Yamuna Water-610 MGD i.e. 1133 cusec) through Haryana, while two water treatment plants (Sonia Vihar and Bhagirathi-production-about 250MGD) located in East Delhi receive Ganga water from Murad Nagar in Uttar Pradesh.
6. Present production of about 935MGD of potable water including 90 MGD from ground water resources is supplied through water supply network of about 14500 KM pipe line. Further more than 1000 water tankers are deployed on daily basis with multiple trips for supplying drinking water in the areas which are not having piped water supply network and in the water deficit areas. Delhi Jal Board is progressively extending piped water supply network in unauthorized colonies. Presently about 93percent of households are covered through piped water supply.



7. A total of 1622 numbers of unauthorized colonies have been covered with piped water supply network and out of these, water supply has been released in 1571 colonies upto November, 2020. Piped water supply in all the unauthorized colonies will be ensured in next two years in phased manner except for 113 colonies which presently are either without NOC from ASI or fall in Forest/O-Zone areas.

8. **Water Demand:**

DJB had earlier considered per capita potable water requirement @ 60 GPCD. Water demand for population of 230 lakhs projected for 2021@ 60 GPCD works out to 1380 MGD (6265MLD). This did not include water requirement for horticulture/gardening/agriculture and industrial process water.

Delhi Jal Board had considered per capita potable water requirement @ 60 GPCD for the MPD-2021 as per the following details:

Table D-7.2.2: Water requirement according to DJB

I	Domestic (150+22) As per CPHEEO Manual	172 LPCD
II	Industrial, Commercial and community Required at 45,000 liter Per hectare per day.	45 LPCD
III	Special uses, embassies, floating population, hotels, airport and railway station etc.	52 LPCD
IV	Fire protection @ 1% of total demand	3 LPCD
	Total	272 LPCD

With above per capita water requirement, there would be shortfall of about 350MGD for the population of 23millions. Given the limited availability of raw water to Delhi, water demand of potable water for domestic use need to be rationalized and need to be progressively reduced to 50 GPCD (225 LPCD) by use of non-potable recycled water of desired quality standard in for non drinking purposes like toilet flushing etc. Water demand for industrial process water & horticulture/gardening/agriculture purposes will need to be necessarily met out from recycling of waste water of desired quality standards.

Requisite infrastructure for use of non-potable recycle water of desired quality standards for toilet flushing with mandatory dual plumbing and dual piping systems is to be ensured by the Land Developing Agencies. Necessary infrastructure for use of non-potable recycled water in horticulture/gardening/agriculture/construction/industrial processes shall also be ensured by the Land Developing Agencies to bring down water demand for the city from 60GPCD to 50 GPCD.

9. **Present Sources Of Raw Water:**

- (a) **Present average potable water production is 935 MGD with raw water available from various sources as per the following details:**

Table D-7.2.3: Quantity of Raw water available from various sources

Source	Raw Water from River Sources (MGD)		Production (MGD)
Ravi-Beas Water	221	610	595
Yamuna Water	389		
Ganga Water	253		250
Ground Water	-		90
Total			935

The production of potable water has increased progressively with commissioning of Water Treatment Plants at Sonia Vihar (140MGD) in 2006, Dwarka (50MGD), Okhla (20MDG) & Bawana (20MGD) in 2015 and implementation of recycle plants at the existing water treatment plants at Chandrawal, Haiderpur and Bhargirti to reclaim process waste water in the old conventional technology. Delhi Jal Board has been able to commission Water Treatment Plants at Dwarka, Okhla & Bawana because of the commissioning of efficient conveyance



system to carry allocated Yamuna and Ravi-Beas Water to Delhi from Munak to Haiderpur, known as Carrier Lined Channel (CLC)/ Munak Canal.

(b) Share in Yamuna Water- MOU of 1994:

Pending constriction of upstream storage, allocation of Yamuna water among the basin states has been made in the MOU of May-1994 as per the table given below;

Table : D-7.2.4: Allocation of Yamuna water among the basin states as in the MOU of May-1994

S. No.	States	Allocation (BCM)			Annual Allocation (BCM)
		July to Oct.	Nov. to Feb	March to June	
1.	Haryana	4.107	0.686	0.937	5.730
2.	Uttar Pradesh	3.216	0.343	0.473	4.032
3.	Rajasthan	0.963	0.070	0.086	1.119
4.	Himachal Pradesh	0.190	0.108	0.080	0.378
5.	Delhi	0.580 (1926 cusec)	0.068 (232 cusec)	0.076 (255 cusec)	0.724 (809 cusec)
Total		9.056	1.275	1.652	11.983

Source: MOU of 12th May, 1994(BCM: Billion Cubic Meter)

Delhi's allocations are for its consumptive drinking water needs and therefore, return flow from Delhi is to be considered for increased allocation of Yamuna water to Delhi. Presently, Upper Yamuna River Board has considered only 495cusec of return flow from Delhi, while allocationg/distributing Yamuna Water to Delhi.

Further, Haiderpur and Wazirabad reservoirs are to be kept full in terms of the Hon'ble Supreme Court orders dated 29.02.1996 in WPC-537/1992 for meeting raw water requirement for Haiderpur WTP and Wazirabad & Chandrawal WTPs.

As per the MoU-1994 on sharing of Yamuna Raw Water, Delhi has water allocation of 0.724 BCM or 6.042 % of total Yamuna water. Whereas the population of Delhi in 1994 was only around 107 Lakh, it has now more than doubled and has one of the highest population density in the country. Therefore, given the primacy to drinking water need in National Water Policy and as impressed upon Hon'ble Supreme Court, share of Yamuna Water to Delhi need to be reviewed and increased.

10. Initiatives by Delhi Jal Board for Improvement of Water Supply Infrastructure:

- I) **Installation of Bulk Flow Meters in Water Supply Distribution System:** DJB has already installed 3170 bulk flow meters in its Primary and Secondary distribution systems and is in process of installing 121 more flow meters for water auditing, rationalization and equitable distribution of water.
- II) To reduce leakage losses, works on replacement of old/ damaged water pipe line network, replacement of outage house service connections etc. are undertaken from time to time for revamping of water supply distribution network. Entire DJB network is also proposed to be sub-divided in District Metered Areas (DMA). Work on 82 DMAs in 3 PPP Projects under the command areas of Nangloi WTP, Malviya Nagar UGR and in Mahrauli-VasantVihar are in progress.
- III) Reform projects on revamping of water distribution infrastructure under existing water treatment plant at Chandrawal & Wazirabad will be implemented for improvement and efficient management of the water supply system. About 330 DMAs are proposed to be taken up under the command of these Water Treatment Plants.
- IV) Formation of District Metered Areas (DMAs) in remaining areas under the jurisdiction of Delhi Jal Board to address the issue of Non Revenue Water and reduction in physical losses of water in the distribution system and will result in improved availability of water to the consumers for the given supply. Concerted approach would be to bring down NRW well below the threshold limit of 15%.



- V) **Recycling Plants:** the existing water treatment plants at Chandrawal, Wazirabad, Haiderpur, Bhagirathi were built on conventional technologies where loss of water during process of treatment is around 10%. DJB has taken up recycling of this process waste to extract treatable water which is being further treated and supplied to consumers for which recycling plants have been installed at each of the above plant with a total installed capacity of 45 MGD.

VI) QUALITY CONTROL INITIATIVES:

Delhi Jal Board has the responsibility to treat the water & provide safe potable water to the citizen of NCT of Delhi.

- For ensuring a smooth and drinkable supply as per standards of BIS 10500-2012, there are 09 laboratories working 24x7 in the Water Treatment Plants (WTPs) to monitor water quality starting from intake of raw water to various stages and upto the consumers end. DJB also has 08 zonal laboratories located in the different parts of the capital.
- Level of Supervision includes (i) Evaluate & examine Raw Water (ii) Determine the treatment process (iii) Round the clock quality monitoring (iv) Plant status monitoring.
- Water quality surveillance in Distribution System: DJB lifts about 450 to 500 water samples daily from WTPs (all stages), Reservoirs, Tube Wells, Ranney Wells, and distribution network for Physical, Chemical & Bacteriological analysis. Essential parameters which are tested in the laboratories are colour, odour, pH Value, Turbidity, Electrical Conductivity, TDS, Alkalinity, Hardness, Ammonical-N, Nitrate, Nitrite, Dissolved Oxygen, Oxygen Absorption, Chloride, Iron, Fluoride, Chromium, Cyanide, Chlorine Demand, Residual Chlorine, Residual Alumina etc.
- DJB also gets its water tested through an independent outside Agency i.e National Environmental Engineering Research Institute (NEERI), CSIR, Ministry of Science & Technology, G.O.I.
- Water Samples at consumers end are also regularly collected and tested by the zonal field staff for residual chlorine to ensure that water reaching to the consumers is contamination free.
- Samples Taken & Passed as per BIS & WHO for the last 3 years is given at Table D-7.2.5:

Table D-7.2.5 Samples Taken & Passed as per BIS & WHO for the last 3 years

S. No.	Year	Total Nos. of water samples	Satisfactory	Unsatisfactory	% of Unsatisfactory
1.	2018	179743	177380	2363	1.3
2.	2019	208532	205774	2758	1.3
3.	2020 (till 22 Dec 2020)	197336	196469	867	0.4

Water samples are collected and tested by the qualified Quality Control personnel under the supervision of ACWAs/CWAs/ Director (T&QC), DJB including bacteriological examination in routine manner to ensure quality of water supplied. The percentages of non-satisfactory samples are less than the permissible limits of 5% for non-satisfactory samples as per the prescribed standards.

Further, WHO guidelines requirement regarding numbers of monthly samples are as under:

“1 sample per 10,000 population, plus 10 additional samples”.

For Delhi having approximate present population of 21 Million, the number of samples per month are be 2110 as per above WHO norms, whereas Delhi Jal Board is lifting and testing more than 16,000 samples per months, which is about seven and half time of the WHO guidelines.

- VII) **Rain Water Harvesting and Ground Water Conservation:** Concerted efforts for sustainability and augmentation of ground-water resources in the NCT of Delhi through aquifer recharge, rainwater harvesting etc are being made. These measures will not only help in sustainability of ground water resources, but would help in augmentation of ground water resources. Initiatives taken by Delhi Jal Board for conservation of ground water resources include;



VIII) Implementation of rain water harvesting systems in its own building installations and is promoting implementation of rain water harvesting systems through incentive and penal provisions in consumers' water bills. Further, to encourage installation of Rain Water Harvesting Structure by domestic consumers, having plot area of 500sqm or more, Delhi Jal Board has approved a 'Scheme for grant of Financial Assistance' to these consumers (including Group Housing Societies) for construction of Rain Water Harvesting Structures. Financial Assistance of 50% of total cost of rain water Harvesting structures or Rs. 50,000/-, whichever is less would be given to the consumers by DJB.

- (a) Delhi Jal Board installed Roof top rain water harvesting system in their own installations and office buildings under their jurisdiction. Out of 771 installations, RWH system is feasible at 594 installations. RWH system is installed at 563 installations up to 01.10.2020. Remaining 31 installations are likely to be completed before monsoon 2021. Delhi Jal Board has identified 89 buildings other than DJB/maintained by PWD/DMCs/GOI/DDA etc in 2019, where RWH system is feasible to be installed. At present RWH system is installed at 20 installations and 59 buildings are likely to be completed before monsoon 2021.
- (b) The implementation of RWH system in schools, colleges, Government buildings etc is monitored by DJB. Out of 4778 schools & colleges, RWH systems have been installed in 3687 schools & colleges upto October 2020.
- (c) Rebate in water bills is given to extent of 10% to the consumers of Delhi Jal Board for having functional and adequate rain water harvesting system and is applicable on plots size of 100sqm and above. At the same time non provision of adequate and functional rain water harvesting by the consumers' of Delhi Jal Board having plot area of 500sqm and above, invite penalties in water bills, which are increased by 1.5 times.
- (d) Intensive awareness program for publicity of Rain Water Harvesting is also carried out from time to time. Publicity material including leaflets have also been distributed at these workshops and also to the general public. Guidelines of DJB for implementation of Rain Water Harvesting and the relevant instructions issued by the Govt. of India on RWH have been uploaded on the Delhi Jal Board website.
- (e) **Revival of Water Bodies:** 155 water bodies have been taken up by Delhi Jal Board for revival/rejuvenation. Works have been awarded in respect of 46 Water Bodies. Works on creation of 04 new lakes at Dwarka WTP, Sector-25 Rohini WWTP, Timarpur oxidation ponds and at Pappankalan WWTP have also been taken up, where treated effluent will be utilized for ground water recharge. DJB will also be reviving 3 other water bodies namely Satpula Lake, Roshnara Lake and Tihar Lake. Delhi Jal Board will also be taking up revival of about 83 water bodies assigned by Irrigation & Flood Control Department, GNCTD.
- (f) Delhi Jal Board has also taken many initiatives in promoting utilization of treated effluent for water conservation. DJB has installed filling points for treated effluent at its 16 STPs located across Delhi for land owning agencies to use treated effluent for watering their parks.
- (g) Decentralized waste water treatment plants may also be set up by tapping the generated sewage within the building premises for utilization of the adequately treated effluent for flushing, AC cooling towers, bus/train washing, gardening and other non-potable purposes or in case of big parks from the manholes of nearby DJB sewerage network. 90% rebate in Sewer Maintenance Charges (sewer maintenance charges are levied @ 60% of water bills and therefore gets reduced to 6%) is given for installation of decentralized STPs and use of adequately treated effluent for non- potable water purposes like horticulture, flushing, etc. This is in addition to the 15% rebate in water bills on having both Rain Water Harvesting and decentralized STPs/ WWTP.

11. Water Augmentation Plan of Delhi Jal Board:

Delhi Jal Board has planned for augmentation of water resources for Delhi. A twin – pronged strategy has been adopted, which focuses on the augmentation of both, ground-water and river (surface)-water resources, while also emphasizing the need for enhanced water conservation measures, rainwater harvesting initiatives, restoration



of water bodies etc. While augmentation of ground water resources are in the hands of Delhi only, outcome of initiatives/proposals for augmentation of river (surface) water resources by Delhi is entirely dependent on cooperation and constructive collaboration from the neighbouring states and the Ministry of Housing & Urban Affairs (Delhi Division), Govt. of India and Ministry of Jal Shakti, Govt. of India for additional availability of raw water to the National Capital for its planned and orderly development in consonance with the availability of water.

(i) Short Term Plans:

Ground Water: Proposed Augmentation of ground water by about 100 MGD in addition to present availability of 90MGD through addition tubewells, recharge etc.

(ii) Medium and Long Term Plans:

- (a) **Himachal Pradesh Share of Un-utilized water in Yamuna Share:** Memorandum of Understanding was signed between the States of Himachal Pradesh and NCT of Delhi on 20.12.2019, for usage of unutilized Yamuna Water share of Himachal Pradesh by Delhi. Availability to Delhi will be dependent on quantum of unutilized component of Yamuna Water allocated to Himachal Pradesh, which is to the tune of 368cusec (198MGD) from November to February and 268 cusec (144MGD) from March to June. Availability to Delhi will also be dependent on the conveyance system and matter has already taken up with the Upper Yamuna River Board for facilitating the release of additional water to Delhi in terms of the aforesaid MOU. Haryana has also been requested for conveyance of this additional water to Delhi through their canal system. A positive and constructive approach from Haryana will greatly help Delhi in resolving the issue of water shortage in the National Capital.

Delhi Jal Board has proposed to setup a new 50 MGD WTP at Dwarka from the additional availability of Yamuna Water as per the MOU between the states of Himachal Pradesh and Delhi. Commissioning of this WTP would enable DJB to provide water to many areas including above housing development through UGR at Mahipalpur either by displacement/re-appropriation of water distribution from Haiderpur WTP or from the proposed new WTP at Dwarka.

- (b) Substitution of of Yamuna Water with Haryana for irrigation purposes:
- (c) Discharge of High Quality Treated Effluent in the River Yamuna at Palla and its reclamation at Wazirabad as Raw Water Source.
- (d) Additional supply of raw water from neighbouring States like Uttar Pradesh, Uttarakhand etc. Raw Water from Uttar Pradesh.
- (e) Upstream Storages on River Yamuna-Renukaji, Lakhwar-Vyasi & Kishau Dam Projects: Delhi is pursuing for early and time bound implementation of three upstream storages on river Yamuna and its tributaries namely, Renukaji Dam, Lakhwar Dam and Kishau Dam, which have been declared as National Projects. Delhi has paid Rs. 214.84 crores to Himachal for Renukaji Dam Project and has agreed to bear 90% of the cost of power component in this project. Delhi has also contributed 50% of its proportionate contribution towards seed money i.e. Rs. 7.79 crores and 8.1 crores for Lakhwar and Kishau Dam projects respectively.

Renukaji, Lakhwar and Kishau Dam Projects are proposed to be constructed on the River Yamuna and its tributaries. These upstream Projects have been declared as National Projects. Interim seasonal allocation of Yamuna water to each basin state are governed as per the MOU of 12th May 1994. On completion of the upstream storages, seasonal allocation of Yamuna Water will be revised by the Upper Yamuna Board and Delhi will get its share in Yamuna water from these storages as per the MOU of 12th May 1994 and interstate agreements on these National Projects. The interstate agreements on Renukaji and Lakhwar Dams have been signed on 28.08.2018 and 11.01.2019 respectively. Delhi has already conveyed its consent on the interstate agreement for the Kishau Dam Project vide letters dated 24.10.2017 and 21.06.2018 from the Hon'ble Chief Minister, Delhi.



The interstate agreement on the Renukaji Dam Project has prioritized allocation for drinking water needs of Delhi and includes that;

- Govt. of NCT of Delhi has agreed to bear 90% of the cost of power component for the project.
- In respect of hydro power, if Himachal Pradesh desires, Power generated and cost thereof can be shared with other beneficiary State (s) through mutual / multilateral agreement to be entered separately.
- Additional water available due to construction of storage as result of implementation of Renukaji Dam Project, shall be regulated by UYRB (Upper Yamuna River Board). The additional water available due to construction of this dam will be made available to Delhi on priority to meet the drinking water needs of Delhi as worked out by UYRB. The arrangement will be only until other storages viz. Lakhwar and Kishau MPPs (Multi Purpose Projects) in upper Yamuna catchment are created at which stage releases from Renukaji Dam shall be carried out keeping in view the overall annual allocation of Yamuna water as per MoU dated 12.05.1994 between the States. Interim seasonal allocations given in the said MoU shall be modified accordingly by UYRB and put up to Upper Yamuna Review Committee (UYRC) for approval.



Annexure-D-7.3

STEPS TAKEN BY THE CENTRAL GOVERNMENT TO CONTROL WATER DEPLETION AND PROMOTE RAIN WATER HARVESTING AND CONSERVATION²

1. Creation of a new Ministry of Jal Shakti for dealing with all matters relating to water at one place in an integrated manner.
2. National Water Policy (2012) formulated by Department of Water Resources, RD & GR, inter-alia, advocates rainwater harvesting and conservation of water and highlights need for augmenting the availability of water through direct use of rainfall. It also, inter-alia, advocates conservation of river, river bodies and infrastructure should be undertaken in a scientifically planned manner through community participation. Further, encroachment and diversion of water bodies and drainage channels must not be allowed and wherever, it has taken place, it should be restored to the extent feasible and maintained properly.
3. Prime Minister has been communicating the importance of water conservation and harvesting at Panchayat level and has been exhorted them to adopt all appropriate measures to make water conservation a mass movement.
4. In compliance to the decision taken by the Committee of Secretaries, an 'Inter-Ministerial Committee' under the Chairmanship of Secretary (WR, RD & GR) has been constituted to take forward the subject of 'Push on Water Conservation Related Activities for Optimum Utilization of Monsoon Rainfall'. DoWR, RD & GR has circulated a Model Bill to all the States/UTs to enable them to enact suitable ground water legislation for its regulation and development, which includes provision of rainwater harvesting. So far, 15 States/UTs have adopted and implemented the ground water legislation on the lines of Model bill.
5. Central Ground Water Authority (CGWA) has issued directions under Section 5 of the Environment Protection Act, 1986 for mandatory rainwater harvesting or roof top rainwater harvesting for all target areas in the Country including UTs. While granting 'No Objection Certificate (NOC)' for drawing ground water, CGWA insists for mandatory rainwater harvesting as per the guidelines issued.
6. Central Ground Water Board (CGWB) under DoWR, RD & GR has also prepared a conceptual document entitled "Master Plan for Artificial Recharge to Ground Water in India" during the year 2013, which envisages construction of 1.11 crore rainwater harvesting and artificial recharge structures in the Country at an estimated cost of Rs. 79,178 crores to harness 85 BCM (Billion Cubic Metre) of water, in an area of 9,41,541 sq.km by harnessing surplus monsoon runoff to augment ground water resources.
7. CGWB has taken up Aquifer Mapping and Management programme during XII Plan, under the scheme of Ground Water Management and Regulation. Aquifer Mapping is aimed to delineate aquifer disposition and their characterization for preparation of aquifer/area specific ground water management plans with community participation. Management plans are shared with respective States for taking appropriate measures.
8. Department of Water Resource, RD&GR has instituted National Water Awards to incentivize good practices in water conservation and ground water recharge. Mass awareness programmes (Trainings, Seminars, Workshops, Exhibitions, Trade Fares & Painting Competitions etc.) are conducted from time to time each year under the Information, Education & Communication (IEC) Scheme of DoWR, RD & GR in various parts of Country to promote rainwater harvesting and artificial recharge to ground water.
9. Ministry of Rural Development in consultation and agreement with the Department of Water Resources, RD & GR and the Ministry of Agriculture & Farmers' Welfare has developed an actionable framework for Natural Resources Management (NRM), titled "Mission Water Conservation" to ensure gainful utilization of funds. The Framework strives to ensure synergies in Mahatma Gandhi National Rural Employment Guarantee Scheme

²Source: http://mowr.gov.in/sites/default/files/Steps_to_control_water_depletion_Jun2019.pdf



(MGNREGS), Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), erstwhile Integrated Watershed Management Programme (IWMP) now PMKSY-Watershed Development Component and Command Area Development & Water Management (CAD&WM), given their common objectives. Types of common works undertaken under these programmes/schemes are water conservation and management, water harvesting, soil and moisture conservation, groundwater recharge, flood protection, land development, Command Area Development & Watershed Management

10. Department of Land Resources is currently implementing 8214 watershed development projects in 28 States covering an area of about 39.07 million ha. under the Watershed Development Component (WDC) of the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) principally for development of rainfed portions of net cultivated area and culturable wastelands. The major activities taken up under the WDC-PMKSY, inter-alia, include ridge area treatment, drainage line afforestation, soil and moisture conservation, rainwater harvesting, horticulture, and pasture development etc.
11. Ministry of Housing & Urban Affairs has released Model Building Byelaws, 2016 which recommends Rainwater Harvesting for all types of Building with plot size 100 sq.m or more. Barring the States/UT of Sikkim, Mizoram and Lakshadweep, all the States have incorporated the provisions in their respective building bye laws. The plans submitted to the local bodies shall indicate the system of storm water drainage along with points of collection of rainwater in surface reservoirs or in recharge wells. Further, all building having a minimum discharge of 10,000 liter and above per day shall incorporate wastewater recycling system. The recycled water should be used for horticultural purposes.
12. Government of India has approved Atal Bhujal Yojana (Atal Jal), a Rs. 6000 Crore Central Sector Scheme, for sustainable management of ground water resources with community participation in water stressed blocks of Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and UttarPradesh.
13. National Action Plan on Climate Change (NAPCC) - A National Water Mission mounted to ensure integrated water resource management helping to conserve water, minimize wastage and ensure more equitable distribution both across and within states.³
14. The Groundwater (Sustainable Management) Model Act, 2017 drafted by the Ministry of Water Resources, River Development & Ganga Rejuvenation provides a new template that states can use to adopt legislation capable of addressing the fast-increasing groundwater crisis faced by many states. This Bill follows on an earlier model bill drafted in 1970 and updated several times until 2005 on which the dozen of existing groundwater acts are based. This 1970 template is unsuited to the present needs of a country where groundwater is now the primary source of drinking water and irrigation. In particular, it fails to provide for local-level regulation of what is often known as the most local source of water and fails to provide for conservation measures at aquifer level. The 2017 Bill integrates legal developments having taking place since the 1970s, such as the decentralization reforms kick-started in the 1990s, the recognition of water as a fundamental right and its recognition as a public trust. In doing so, it provides new bases for regulating groundwater as a public resource and to take measures at aquifer level, something that is crucial to address ongoing overexploitation and falling water tables .

³<http://nwm.gov.in/>



Annexure-D-7.4

BRIEF ON SEWAGE GENERATION AND INSTALLED TREATMENT CAPACITIES ALONG WITH SOLID WASTE GENERATION STATUS OF NCR

The NCR sub-regions and districts wise sewage treatment plants (STPs) with installed capacities, availability of toilet facilities are given in **Table D-7.4.1**. The total sewerage coverage network and number of sewage treatment plants in NCR sub-regions is given in **Table D-7.4.2**. It is evident that a significant gap persists for the treatment capacities in the sub region wise urban areas and also sewerage coverage and generated sewage volumes in all the four states.

Table D-7.4.1: NCR State Wise Sewage Generation and Installed Treatment Capacity, 2019

S. No.	Sub Region	Sewage Generation in MLD	Treatment Capacity in MLD	Percent treatment capacity
1.	Delhi	3,276	2,807	86
2.	Haryana	770	1,005	131
3.	Uttar Pradesh	1,081	1,394	129
4.	Rajasthan	42	32	76
5.	NCR	5,170	5,238	101

Source: NCR Planning and Monitoring Cells, 2019 and CPCB

Note: For sewage generation data of Faridabad, Hapur and Baghpat districts is excluded.

Table D-7.4.2: Sub Region Wise Sewerage Network Services in Urban Areas of the NCR

S. No.	Region and Sub- Region	District Level Coverage of Sewage Network Services in Urban Areas (in percent of total area)	STPs
1.	Delhi	79.00	35
2.	Haryana	81.36	60
3.	Uttar Pradesh	16.54	35
4.	Rajasthan	97.89	03
5.	NCR	68.70	133

Source: NCR Planning and Monitoring Cells, 2019.

Note: District level coverage of sewage network services in urban areas excludes data of Faridabad, Jind and Baghpat districts.

Table D-7.4.3: Sub Region Wise Solid Waste Generation in Major Urban Area⁴

S. No.	Sub Region	Solid Waste Generation (MT/D) in urban areas	Household level coverage of solid waste management services (100%)	Efficiency of collection of municipal solid waste (100%)	Percent of total waste generation in urban areas
1.	Delhi	13,250.00	100	100	65.92
2.	Haryana	2,514.88	87.81	92.91	12.51
3.	Uttar Pradesh	3,830.40	97.38	99.17	19.06
4.	Rajasthan	504.00	86.97	85.91	2.51
Total NCR		20,099.28	93.04	94.50	100

Source: NCR Planning and Monitoring Cells, 2019 Note: In Haryana data of Faridabad and Panipat districts is not included.

For the entire sub-region the household coverage of solid waste collection and efficiency of collection, the NCT Delhi has achieved the target of 100 percent but other sub-regions are lagging behind. The coverage and efficiency of collection of other sub- regions are not as per service level benchmarks (SLBs). Details are given in **Table D-7.4.3 & D-7.4.4**.

⁴ Note: Data provided by the NCR States



Table D-7.4.4: District Wise Solid Waste Generation in Major Urban Areas

S. No.	SubRegion	Districts	Solid Waste Generation (MT/D)in UrbanAreas**	House hold level coverage of solid waste management services (100%)	Efficiency of Collection of municipalsolid waste(100%)
1.	Delhi	Delhi	13,250	100.00	100.00
2.	Haryana	Bhiwani	100.30	100.00	100.00
3.		CharkhiDadri	22.00	95.00	95.00
4.		#Faridabad	--	--	--
5.		Gurugram	1,279.83	100.00	100.00
6.		Jhajjar	115.00	100.00	100.00
7.		Jind	137.13	76.25	76.25
8.		Karnal	203.50	100.00	92.86
9.		Mahendragarh	44.95	90.00	90.00
10.		Mewat	41.59	100.00	95.00
11.		Palwal	44.08	--	80.00
12.		Panipat	--	--	--
13.		Rewari	82.00	100.00	93.33
14.		Rohtak	176.5	100.00	100.00
15.		Sonipat	268	92.50	92.50
Sub-Region Haryana			2,514.88	87.81	92.91
16.	UttarPradesh	Baghpat	99.11	87.50	96.25
17.		Bulandshahr	90.50	100.00	100.00
18.		GautamBudhNagar	1,010.45	98.57	98.57
19.		Ghaziabad	1,262.42	100.00	100.00
20.		Hapur	119.75	100.00	100.00
21.		Meerut	911.03	97.54	98.93
22.		Muzaffarnagar	225.30	95.42	99.64
23.		Shamli	111.84	100.00	100.00
Sub-Region UttarPradesh			3,830.40	97.38	99.17
24.	Rajasthan	Alwar	277.70	76.67	84.21
25.		Bharatpur	226.30	97.28	87.60
Sub-Region Rajasthan			504.00	86.97	85.91

²Note: Data provided by the NCR States

Note: **District Level Solid Waste Generation in urban Areas may vary once information from the towns which are yet to share are added to the existing ones.

Source: NCR Planning and Monitoring Cells, 2019



GLOBAL EXAMPLES OF WASTES TAXING

1.0 Tax on Waste (landfill tax) introduced in 1996, is the most important emission tax in Finland. The budgeted revenues in 2010 were at 52 million⁵. The waste taxes aim to promote waste recovery and reduce the amounts of waste ending up in landfills. Waste taxes are paid by the owner of the landfill, who passes on the cost through fees charged for the reception of waste. It is proposed by the current Government to extend the tax base beyond municipal landfills and include all waste which could be reutilized on the basis of technical, economical or environmental premises. It is anticipated that with this review the tax rate will be increased from 30 per tonne of waste to 40 per tonne.

1.1 Despite Refund Scheme in Finland

Finland set up one of the most successful systems in Europe to reduce packaging pollution. The government introduced for the first time a deposit refund system for beverage packaging in 1950. The scheme now collects disposable as well as refillable glass and plastic (PET) bottles. With deposit amounts ranging from €0.10 to €0.40 per container, return rates for single-use packaging peaked 95% in 2015. This was attributed to the close co-operation between the government, civil society, retailers and the beverage industry. Following the introduction of a beverage packaging tax in 1994, the government also offered incentives to producers and importers to take part in the deposit refund system.

1.2 Plastic Bag Tax in Ireland

In 2002, Ireland introduced a €0.15 plastic bag levy on plastic bags at the point of sale, which increased to €0.22 in 2007. The aim was to reduce consumption and the adverse effects plastic bag litter had on the landscape. As a result, discarded plastic bags fell from 5% of total litter pollution in 2001 to 0.13% in 2015. The levy generated €200 million over a 12-year period. The revenue was used to finance environmental projects across the country. The Irish plastic bag levy is regarded as one of the most successful and well-received environmental measures ever introduced.

1.3 LandfillTax in the UK

A landfill tax was introduced in the UK in 1996 to reflect the environmental cost of landfilling (e.g., greenhouse gas emissions) and also to reduce waste generation and boost recycling. Thanks to the tax, the amount of waste sent to landfill decreased from 50 million tonnes in 2001 to 12 million tonnes in 2015. Inert, non-hazardous waste (e.g., concrete, sand) is currently levied at £2.65 (€2.96) per tonne, while the tax on biodegradable waste (e.g., food, paper) stands at £84.40 (€94.21) per tonne.

1.4 NOx Tax in Sweden

In 1992, the Swedish government introduced a tax on nitrogen (NOx) a powerful pollutant linked to acid rain and respiratory problems which helped reduce NOx emissions by 30-40 percent. The tax was applied to energy produced for space heating, electricity production and industrial processes in order to curb soil acidification, which undermines crop and pasture production. The tax rate was initially set at SEK 40 per kg NOx emitted for all types of fuel, and was increased to SEK 50 per kg in 2008 (about €5 at the time). The revenue was used to reimburse those taxed plants emitting low volumes of NOx in order to incentivise energy efficiency and reduce any potentially negative impact on competitiveness. This led many companies to implement emission reduction measures ahead of the introduction of the tax. Annual revenue reached £900 million (€1 billion) in 2016.

1.5 Case studies, prepared by Institute for European Environmental Policy (IEEP) and partners as part of a major study for the European Commission on ‘Capacity building for environmental tax reform’, summarise a wide

⁵<https://sustainabledevelopment.un.org/index.php?page=view&type=99&nr=133&menu=1449>



range of taxes, charges, subsidies and payments related to several areas of environmental policy which are given below:

Table D-7.5.1 Taxes, charges, subsidies and payments related to several areas of environmental policy

Air pollution	Waste, resources & circular economy	Water quality & marine litter	Water stress & availability	Biodiversity & land use
Air pollution fees and taxes: Czech Republic, Hungary, Slovakia, Sweden Fluorinated greenhouse gas tax: Spain	Landfill taxes: Austria, Greece, UK Pay-as-you-throw schemes: Benelux Packaging charges/taxes/deposit refund: Belgium, Finland, Latvia, Romania Plastic bag levy: Ireland Environmental/natural resource charges: Belgium, Estonia, Lithuania Aggregates levy: UK	Wastewater fee: Poland Pesticide/fertilizer/phosphorus taxes/charges: Denmark x2, Italy, Sweden Packaging charges/taxes/deposit refund: Belgium, Finland, Latvia, Romania Plastic bag levy: Ireland Environmental/natural resource charges: Belgium, Estonia, Lithuania Port fee reductions: Netherlands (Rotterdam & Amsterdam)	Water abstraction charges: Bulgaria, France Water pricing: Cyprus, Malta, Portugal, Netherlands	Forestry-related fees/charges: Austria, Croatia, Slovenia, Spain Biodiversity offsetting: Germany Result-based agri-environment measures: Germany Peatland tax reform: Finland Pesticide/fertilizer/phosphorus-related taxes/charges: Denmark x2, Italy, Sweden Hunting and fishing-related fees/taxes: Estonia, Ireland, Iceland Ecological fiscal transfers: Portugal

Source: <https://ieep.eu/publications/new-suite-of-40-case-studies-on-environmental-fiscal-reform>.

BRIEF LEGACY WASTE GUIDELINES

1. **Recently, the National Green Tribunal (NGT)** has directed a committee to assess the amount of damage caused to the environment due to the dump sites (legacy waste) in Delhi. The committee comprises representatives from the **Central Pollution Control Board, National Environmental Engineering Research Institute (NEERI)** and IIT Delhi.
2. **Key Points**
 - i) Legacy wastes are the wastes that have been collected and kept for years at some barren land or a place dedicated for Landfill (an area to dump solid waste).
 - a) This waste can be roughly grouped into four categories.
 - b) Contained and stored waste (contained or stored waste are wastes in tanks, canisters, and stainless-steel bins).
 - c) Buried waste.
 - d) Contaminated soil and groundwater
 - e) Contaminated building materials and structures.
 - ii) **Biomining method** has been proposed by the Central Pollution Control Board (CPCB) for the effective disposal of legacy wastes.
 - iii) **Environmental Impact of Legacy Waste**
 - a) Legacy wastes not only occupy large space, but also become a breeding ground for pathogens, flies, malodors and generation of leachate, which may lead to water contamination.
 - b) They also contribute to generation of greenhouse gases and pose risk of uncontrollable fire.
3. **Biomining**
 - 3.1 Biomining is the process of **using micro organisms (microbes)** to extract metals of economic interest from rock ores or mine waste. Biomining techniques may also be used to **clean up sites** that have been polluted with metals.
 - 3.2 It is usually used for old dumped waste that remains in a **partly or fully decomposed state with no segregation in existence between wet and dry waste**. In the cost-effective method of biomining, treatment is done by dividing the garbage heap at the site into suitable blocks to let the air percolate in the heap.
 - 3.3 As a result, the leachate which is the water in the heap with suspended solid particles is drained off and microbes are sprayed in the heap to initiate biological decompositions. The waste is turned over several times in order to devoid the waste to leachate as much as possible. This biological decomposition of the waste **decreases the volume of the waste by 40 percent**.
4. Legacy waste has several ill-effects like generation of greenhouse gases, pollution of the entire ecosystem around the dump site, posing risk of uncontrollable fire, etc. Thus, it is very critical to start working on clearing it today and ensuring that fresh waste is also handled accordingly. This will also improve the morale of the ULB and its residents. It is *the responsibility of ULB* to ensure that remediation of dumpsite is done inhouse or by engaging a competent agency. ULB will have to pay an agency the expenditure for remediation of legacy waste as one cannot forecast the chance of recovering recyclables from the highly contaminated waste nor forecast revenue from selling of recyclables so as to financially sustain the entire model. However, a clause can be made by ULB during appointing agency that the revenue generated by selling any recoverable material shall be transferred back to ULB. This can make the executing agency a technology and manpower partner in the project, who is paid for a management cost.



5. The ULBs can either go with the 5 models explained for bioremediation and bio-mining of legacy waste, or make its own cost-effective, space effective and sustainable option, introduce new technology or install various other machinery/equipment based on the practical circumstances of legacy waste. Various types of waste will be recovered from legacy waste like dry waste, soil conditioner, hazardous waste, bio-medical waste, construction and debris waste, e-waste, etc. All these wastes should be disposed of as per the norms and guidelines issued by MoEF&CC under respective waste management and handling rules under the Environment (Protection) Act 1986. It would be the responsibility of ULB to bear the cost of disposal of all these types of waste. Waste below the size of 50 mm need not be shredded before sending to cement companies for co-processing. For waste above the size of 50 mm, tie-up can be done with neighboring cement plants to install shredder at their plant if agreeable.
6. The ULBs also needs to ensure that fresh waste generated in city is handled collected and processed separately as per the norms and guidelines issued by MoEF&CC. Covered collection vehicle and segregated collection needs to be ensured. For dry waste material recovery facility should be installed to recover maximum material for ensuring that our cities are zero waste to landfill cities. Recyclable waste is sent to authorize recyclers and non-recyclable waste should be sent to hot mix plants for plastic roads or to P2F (Polymer to Fuel) plants or for co-processing to cement plants. Wet waste should be processed to get compost/ biogas etc. Bio-medical waste, hazardous waste, e-waste, construction and debris waste, etc. should be sent to respective authorized disposal sites.
7. It is also very important to understand that to ensure that no such legacy waste is accumulated in future, all the ULB's should refrain from floating tenders for collection, handling, and processing of mixed waste. All the ULB's should keep infrastructure required for collection, handling and processing different type of waste separately. There are various benefits attached to clearing dumpsites which need to be understood by the ULB to speedily start work on it.
8. These guidelines apply to cities, towns and even villages. Bioremediation and bio-mining of MSW projects may not be economically viable but are mandatory to improve waste management ecosystems across India. Besides, land cleared by way of bio-mining and bioremediation of legacy waste, huge land area is evacuated, which can compensate the cost of its treatment (Guidelines for Disposal of Legacy Waste (Old Municipal Solid Waste), CPCB, 2019⁶).

⁶http://www.toxiclink.org/docs/LegacyWasteBiomining_guidelines_29.04.2019.pdf and <https://www.drishtiias.com/daily-updates/daily-news-analysis/legacy-waste>



Annexure-D-7.7

PROPOSED DAMS FOR DELHI NCR WATER FACILITATION

1. Upstream Storages on River Yamuna- Renukaji, Lakhwar-Vyasi&Kishau Dam Projects: Delhi is pursuing for early and time bound implementation of three upstream storages on the river Yamuna and its tributaries namely, Renukaji Dam, Lakhwar Dam &Kishau Dam. These have been declared as National Projects.
2. The proportionate share of seed money/cost for Delhi in the Renukaji Dam Project is Rs. 26.13 crores. Delhi has already paid Rs. 214.84 crores to Himachal Pradesh for Renukaji Da Project and has agreed to bear 90% of the cost of power component in this project. Delhi has also contributed 50% of its proportionate contribution towards seed money i.e. Rs. 7.79 crores and 8.1 crores for Lakhwar and Kishau Dam projects respectively.
3. Interim seasonal allocations of Yamuna water to each basin state are governed as per the MOU of 12th May 1994. On completion of the upstream storages, seasonal allocation of Yamuna Water will be revised by the Upper Yamuna Board and Delhi will get its share in Yamuna water from these storages as per the MOU of 12th May 1994 and interstate agreements on these National Projects. The interstate agreements on Renukaji and Lakhwar Dams have been signed on 28.08.2018 and 11.01.2019 respectively. Delhi has already conveyed its consent on the interstate agreement for the Kishau Dam Project vide letters dated 24.10.2017 and 21.06.2018 from the Hon'ble Chief Minister, Delhi.
4. The interstate agreement on the Renukaji Dam Project has prioritized allocation for drinking water needs of Delhi and includes that;
5. Govt. of NCT of Delhi has agreed to bear 90% of the cost of power component for the project.
6. In respect of hydro power, if Himachal Pradesh desires, Power generated and cost thereof can be shared with other beneficiary State (s) through mutual/multilateral agreement to be entered separately.
7. Additional water available due to construction of storage as result of implementation of Renukaji Dam Project, shall be regulated by UYRB (Upper Yamuna River Board). The additional water available due to construction of this dam will be made available to Delhi on priority to meet the drinking water needs of Delhi as worked out by UYRB. The arrangement will be only until other storages viz. Lakhwar and Kishau MPPs (Multi-Purpose Projects) in upper Yamuna catchment are created at which stage releases from Renukaji Dam shall be carried out keeping in view the overall annual allocation of Yamuna water as per MoU dated 12.05.1994 between the States. Interim seasonal allocations given in the said MoU shall be modified accordingly by UYRB and put up to Upper Yamuna Review Committee (UYRC) for approval.



REVIVAL AND REJUVENATION OF RIVER YAMUNA

- 1.0 An integrated approach be taken for revival or rejuvenation of river Yamuna. Revival/ or rejuvenation of River Yamuna in the stretch upstream of Wazirabad Barrage can be taken up as a priority project. The Environmental Flows requirements, particularly for the lean season, should be re-assessed and be ensured by all the concerned agencies. Additional water at Wazirabad Barrage be released downstream to improve quality of river water between the stretch from Wazirabad Barrage to Okhla Barrage and increase availability of water at Okhla Barrage for its distribution. The neighbouring states of Uttar Pradesh & Haryana can utilize treated effluent from Delhi for their irrigation needs and in lieu can provide river raw water to Delhi for its drinking water needs.
- 1.1 Delhi Jal Board may ensure discharge treated effluent of high quality standards from its upcoming Coronation STP in the River Yamuna at Palla which can be lifted with river water at Wazirabad for use as raw water source for further treatment to augment its limited water resources. Delhi may even consider providing the same to Haryana directly for its irrigation needs. Haryana can provide river raw water from its share to Delhi for its drinking water needs. Delhi Jal Board has also taken up matter with the State of Uttar Pradesh for providing river raw water from its share in lieu of treated effluent of adequate quality by Delhi for irrigation needs of Uttar Pradesh⁷.

Box D-7.8.1:

In July 2018, Delhi government announced that, taking a cue from Singapore's NEWater policy, it would use treated sewage water to augment 15-20% of overall supply within two years, increasing to 50% in the following five years. Under the plan, treated water was to be pumped from a new water treatment plant at Coronation Park into the Yamuna near Palla inside the Delhi border. Treated water would mix with the river water and travel 11km downstream, in the process undergoing natural purification. This water would be re-drawn at the Wazirabad treatment plant (WTP) and put through further purification as raw water⁸.

River Rejuvenation Committee, Govt. of NCT Delhi prepared an Action Plan for River Yamuna in compliance to directions of the Hon'ble NGT orders dt. 20.09.2018 and 19.12.2018 (OA No. 673/2018 in the matter of news item published in 'The Hindu' authored by Shri. Jacob Koshy titled "More river stretches are now critically polluted: CPCB"). In the Action Plan, it is proposed under "Utilization of Treated Wastewater" that for irrigation in UP. in next 4 years subject to consent of UP. Irrigation Department, UP. can use Delhi's treated effluent of adequate quality for irrigation in lieu of raw water supply for proposed 140 MGD WTP at Sonia Vihar. However, cost sharing not mentioned⁹.

- 1.2 Revival or rejuvenation of River Yamuna in the stretch between Wazirabad & Okhla Barrages (Delhi Segment): There is a flow of about 105 MGD from Haryana through Badshahpur and Dharampuri Drains (90 MGD) & Diversion Drain-6 (15 MGD), which contribute flows to Delhi Segment. Out of this, about 80 MGD is untreated. Concerned Departments/ agencies of the Govt. of Haryana should to take suitable measures for it.
- 1.3 Delhi is taking multifarious measures to improve the quality of river water in Delhi Segment. Focal areas include;
 - a) Increasing the sewage treatment capacities,
 - b) Increased collection and conveyance of sewage to existing and proposed sewage treatment plants.
 - c) Extending sewerage system including in un-planned development in Delhi which is more than 50%.
 - d) Motivating people to take sewer connections. In December 2019 the Delhi government had launched the Mukhya Mantri Free Sewer Yojana under which people were entitled to get free sewer connections by March 2020.

⁷Source-views of CEO, DJB in the workshop

⁸Source:http://timesofindia.indiatimes.com/articleshow/70952395.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

⁹Source:<http://environment.delhigovt.nic.in/wps/wcm/connect/da19c1804a3947108be99f15ffe59382/RRC+revised+action+plan.pdf?MOD=AJPERES&lmod=-1756106827&CACHEID=da19c1804a3947108be99f15ffe59382>



- 1.4 Delhi Jal Board has identified around 600 locations under phase-I of the project, where sewage treatment plants (STP) decentralized could be set up. All these locations are in unauthorized colonies and village areas where the majority of population has no access to a sewerage network. Delhi government is further considering making it compulsory for group housing societies, schools, apartment buildings, etc., to have decentralized STPS onsite. A rule already exists that makes it compulsory for new buildings to have in-situ waste treatment and there a 15% rebate if such a project exists¹⁰. Increased flow in the river Yamuna will reduce river water pollution. The matter of e-flow in the River Yamuna has been dealt in detail by the NGT in OA No. 06 of 2012 pertaining to Clean and Rejuvenated Yamuna River. Order dated 11.06.2015 include the observation of the Principal Committee with respect to minimum e-flow required in the River Yamuna for its rejuvenation and suggested that lower limit (minimum e-flow) at Hathnikund Barrage may not be less than 2500 cusec. However, in terms of Hon'ble NGT Order of 2015, 10 cumec or 352 cusecs is being released from Hathnikund Barrage. However, till the time, the three upstream storages (Renukaji, Lakhwar & Kishau) are constructed on the River Yamuna and its tributaries, about 1500 cusec may be released from the Hathnikund Barrage in the River Yamuna. These releases in the River Yamuna will revive it to large extent between the stretch from Hathnikund Barrage to Wazirabad Barrage and will make available enough water for keeping Wazirabad pond full in terms of the Hon'ble Supreme Court Orders dated 29.02.1996 to meet present drinking water needs of Delhi.
- 1.5 As regard water requirement at Yamuna, during the monsoon 50 percent of the free flow is needed to avoid silting of the riverbed and during the non-monsoon period, 60 percent is needed to avoid algal choking. Thus for a genuine ecological flow for a river to be healthy and maintain all its associated functions, the free flow must be close to 50-60 percent of the total flow, all year round. As per a Memorandum of Understanding (MOU) between the basin states of the Yamuna, a minimum flow of 10 m³/s is required throughout the year for ecological purposes¹¹.
- 1.6 A High Powered Committee for Yamuna River Development chaired by the Lt. Governor, Delhi had been constituted by the Government of India in August, 2007. It is suggested that this committee be expanded to include the Chief Secretary, UP as well as five expert members in the field of science and engineering and its mandate to also include integrated management and coordination among various planning, execution, funding and regulatory agencies of the two states to be involved in the restoration and management of the river in the Delhi stretch. The HPC should also closely liaise with the NGRBA for better integration of their activities, since Yamuna is a sub-basin of the Ganga Basin.

Box-D-7.8.2: Case Brief

Case: Delhi water supply and sewerage disposal undertaking vs. State of Haryana

Order Date: 29.02.1996

Deciding Court: In the Supreme Court of India Articles/ Acts referred: Article 32 and Article 262

Judgment: The case related to the insufficient release of water into the river Yamuna from the Tajewala headworks. This was leading to insufficient drinking water for people of Delhi. The court opined that the primary use of water is for drinking. This need cannot remain unfulfilled at the cost of irrigation water. Under Article 32 of the Constitution, the case was brought to court under a writ petition. Also, the Court under Article 262 under which interstate water disputes are resolved entertained the grievance of the petitioner. The court ordered that the Hyderpur and Wazirabad reservoirs should remain filled with water through river Yamuna. The court also opined that this order of the court was to be also observed by upper Yamuna Board, the management body for implementing the MOU, which was non-functional by this time.

(Source: Discussion Paper "Towards Understanding the Right to Water and Sanitation" published by WaterAid India Liaison Office in Dec. 2009)

¹⁰<https://timesofindia.indiatimes.com/city/delhi/kejriwal-reviews-plan-for-decentralised-stps/articleshow/60835396.cms>

¹¹Source:<https://www.indiawaterportal.org/articles/how-much-water-should-flow-yamuna>



8. URBAN REGENERATION – HOUSING AND HABITAT

Brief of Major Initiatives including policies & programmes taken by the Govt. of India and NCR participating States for Housing

Recent years have been years of reforms in the industry with an increased focus on transparency and customer centricity by both, policy makers and developers. The regulatory framework has helped regain the trust in the industry. Further, the systematic implementation of the government reforms will definitely help in rekindling consumer sentiment, which will eventually push the growth of residential segment in the coming decades.

A) Initiatives of Govt. of India

1. Housing policies in India have come a long way since the 1950s; initially the policies were welfare centric which later on dwelled to be economic-centric policies. The role of government has also seen a shift from being provider to being the facilitator of housing. Dividing the policies in India into four phases as the first phase comprising of first two decades (1950s to 1970s) where the policies were taking shape that focused more upon integrating all sections of the society. Second phase (1970s- mid-1980s), shifting the focus to economically weaker section (EWS) of the society. The third phase (1980s to 2000s), focusing more on physical provision of housing as well as housing finance mechanisms. The last phase (2000s to present) shifting the role of government as facilitator of housing.

Schemes like Environmental Improvement of Urban Slums (EIUS) Scheme, National Slum Development Programme (NSDP), Valmiki Ambedkar Awas Yojana (VAMBAY), Basic Service for Urban Poor (BSUP) and Integrated Housing & Slum Development Program (IHSDP) under Jawaharlal Nehru National Urban Renewal Mission (JnNURM), Rajiv Awas Yojana (RAY), Interest Subsidy Scheme for Urban Poor (ISHUP)/ Rajiv Rinn Yojana (RRY) etc. has been implemented to ensure greater home ownership. Below are some of major schemes implemented by GoI to reduce the demand of housing in the country:

- 1.1 **Jawaharlal Nehru Urban Renewal Mission (JNNURM):** The major reform came with the onset of JNNURM, 2005. The program was launched with an objective to improve state of infrastructure in cities. The two sub-missions under JNNURM are Basic Services for Urban Poor (BSUP) designed to upgrade and improve the existing conditions of slums by giving them access to basic amenities like water and sanitation, health care and education etc. The second part is Integrated Housing and Slum Development Program (IHSDP), designed to tackle the poor housing for urban slum dwellers as per 2001 Census. The scheme has been replaced by Atal Mission for Rejuvenation and Urban Transformation (AMRUT) in 2015.

- 1.2 **Pradhan Mantri Awas Yojana (Urban)-PMAY (U):**

Table D-8.1.1: Physical and Financial Progress in NCR Districts under Pradhan Mantri Awas Yojana - Urban (PMAY-U) (as on 01.01.2021)

Sub Region	Districts	Total number of Dwelling Units Constructed	Total number of households benefited	Number of Dwelling Units under - construction for households	Number of Dwelling Units proposed to be constructed for households	Central Assistance Approved (Rs in Cr.)	Central Assistance Released (Rs in Cr.)
NCT of Delhi	11	22,607	22,607	-	22,607	509.76	509.76
Haryana	14	2,995	2,995	20,054	1,60,463	2861.43	637
Uttar Pradesh	8	70,737	70,563	61,801	1,95,950	3851.68	2216.2
Rajasthan	2	1,037	1,037	1,056	11,786	348.24	187.11
Total	35	97,376	97,202	82,911	3,90,806	7,571	3,550

Source: PMAY, MoHUA



Mission launched on 25th June 2015 with a mission to provide housing for all in urban areas by year 2022 and to address the issue of affordable housing in urban areas. The Mission provides Central Assistance to the implementing agencies (Urban Local Bodies, Development Authorities, Housing Boards etc.) through States/ Union Territories (UTs) and Central Nodal Agencies (CNAs) for providing houses to all eligible families/ beneficiaries against the validated demand for houses for about 1.12 cr. The Mission has been implemented through four verticals giving option to beneficiaries, ULBs and State Governments. These four verticals are as:

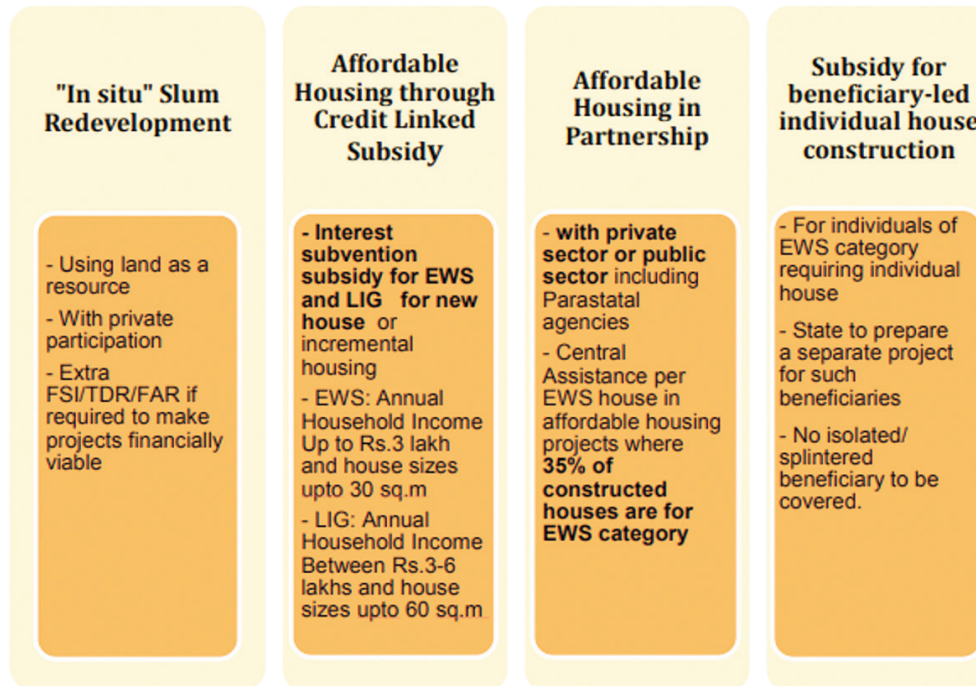


Figure. D-8.1.1 Four Verticals of PMAY (U)

1.3 **Pradhan Mantri Awas Yojana (Gramin)- PMAY-G:** Rural housing programme, as an independent programme, started with Indira Awaas Yojana (IAY) in January 1996 addressed towards the housing needs in the rural areas. However, due to lack of transparency in selection of beneficiaries, low the quality of the house and lack of technical supervision etc. IAY has been re-structured into Pradhan Mantri Awaas Yojana –Gramin (PMAY-G) from 1st April 2016 under housing for All” by the scheme 2022. PMAY-G aims at providing a pucca house, with basic amenities, to all houseless householder and those households living in kutcha and dilapidated house, by 2022. The immediate objective is to:

- cover 1.00 crore household living in kutcha house/dilapidated house in three years from 2016-17 to 2018-19.
- minimum size of the house has been increased to 25 sq.mt (from 20sq.mt) with a hygienic cooking space.
- unit assistance of Rs. 1.20 lakh in plain and Rs 1.30 lakh in hilly states, difficult areas and IAP district.
- assistance for construction of toilet shall be leveraged through convergence with SBM-G, MGNREGS or any other dedicated the source of funding.
- convergence for piped drinking water, electricity connection, LPG gas connection etc. different Government programmers are also to be attempted under PMAY -G.

1.4 As of July 2019, 8.36 million houses have been sanctioned under the “Housing for All” initiative across the nation and construction for 4.9 million units has begun and 2.6 million units of which have been completed, making it highly possible to achieve the 10 million houses target by 2022. Projected subsidy disbursement during 2019-22 for the same is projected to be Rs. 1 trillion.



1.5 National Urban Rental Housing Policy (2015): Ministry of Housing and Urban Affairs (MoHUA) had constituted a Task Force on Rental Housing (TFRH) to provide recommendations for formulating national urban rental housing policy of 2015. National Urban Rental Housing Policy (2015) was formulated with the vision to create a vibrant, sustainable and inclusive rental housing market in India. The policy targets the shelter for the homeless, social rental housing, need based rental housing (for migrants, working men, students etc.) and market based rental housing (employees of ULBs/State/PSUs/NGOs etc.) The broad objectives of the NURHP, 2015 are:

- a) To create adequate rental housing stock by promoting Social Rental Housing (SRH) with direct or indirect support from Government (State) with special focus on affordability of vulnerable groups and urban poor.
- b) To promote Shelter facilities for the most vulnerable groups within the homeless population.
- c) To promote Social Rental Housing for urban poor as a viable alternative housing option.
- d) To promote Need Based Rental Housing (short/mid/long term basis) for specific target groups such as migrant labour, single women, single men, students (any other target group as defined by the State) who have the ability to pay only up to a certain amount of monthly rent
- e) To promote Market Driven Rental Housing (MDRH may or may not be eligible for direct benefits from government)
- f) To promote Private Rental Housing (PRH) as an interim measure towards aspirational home buyers.
- g) To enable Institutional Rental Housing (Hostels/PGs/dormitories) for working class with special focus on low earning employees working with Government/PSUs/Corporate houses/Industries/NGOs etc (any other category as defined by the State Government from time to time).
- h) To remove legal, financial and administrative barriers for facilitating access to tenure, land, finance and technology.
- i) To enable formalization/regularization of Rental Housing on pan India basis through adoption of Model Tenancy Act, 2015 of Ministry of HUPA.
- j) To facilitate fund flow from government and private sector through innovative financial Instruments to incentivise rental housing.
- k) To promoting Public-Private Partnership (PPP) to construct, manage, maintain and operate rental housing stock (Cooperative societies, Neighborhood Associations, Resident Welfare, Associations etc.).

1.6 National Urban Housing and Habitat Policy (NUHHP), 2007: NUHHP 2007 has been formulated keeping in view the changing socio-economic parameters of the urban areas and growing requirement of shelter and related infrastructure. Identified 'Affordable Housing for All' as a key focus area to address concerns that could potentially impede sustainable urban development. The National Housing and Habitat Policy (NUHHP), 2007 envisaged that the States would prepare a State Urban Housing and Habitat Policy and also a State Urban Housing & Habitat Action Plan to achieve the housing policy objectives through institutional, legal & regulatory reforms, fiscal concessions, financial sector reforms. The major objectives of the policy are:

- a) facilitating accessibility to serviced land and housing for EWS and LIG
- b) land assembly, development and disposal to be encouraged by both private and public sectors
- c) forging strong partnerships between public, private and cooperative sectors
- d) creating adequate housing stock both on rental and ownership basis
- e) using technology to modernise and enhance energy and cost efficiency, productivity and quality

1.7 Real Estate (Regulation and Development) Act, 2016 (RERA Act): is considered as one of the landmark legislations. Its objective is to address grievances of buyers and to bring transparency and accountability in country's real estate sector. This is in line with the vast and growing economy of India as in future many people will be investing in real estate sector. Following are the main features of this legislation:



1. According to the new law, the developer can't make any changes to the plan without the written consent of the buyer. This provision will not allow the developer to increase the cost of their projects.
2. The law ensures that realty project is completed in time. If delayed, then the developer will have to pay interest on the amount paid by the buyer.
3. Registration is mandatory for all commercial and residential real estate projects where the land is over 500 square metres or includes eight apartments & which are under-construction.
4. As per the new act, every phase of apartment will be considered a standalone real estate project, and separate registration needs to be obtained for each project.
5. It is compulsory for a state to establish a State Real Estate Regulatory Authority as per the new act. Buyers could approach this body for redressal of their grievances
6. The property will have to be sold to buyers based on carpet area and not on super built-up area which will become illegal under the new law.
7. Failing to register a property will attract a penalty up to 10% of the project cost and a repeated violation could send the developer in jail.
8. As per the new law, the developer will have to place 70% of the money collected from a buyer in a separate escrow account to meet the construction cost of the project. This will keep a check on developers who divert the buyer's money to start a new project, instead of finishing the one for which money was collected & also ensure that the respective project is completed in time.
9. If the buyer finds any shortcomings in the project then buyer can contact the developer in writing within one year of taking possession.
10. The law has a provision of a maximum jail term of three years with or without a fine, for a developer who violates the order of the appellate tribunal of the RERA.

B) Initiatives of NCR participating States

In various sub-regions of the NCR, the policies and programmes for housing and slum improvement implemented by the respective state governments were as follows :

- i) **Haryana Sub Region** – The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was implemented in Faridabad town. Under this Mission, the Sub Mission of Basic Services for the Urban Poor (BSUP) was implemented. Further, the Integrated Housing and Slum Development Programme (IHSDP) was also implemented in the towns of Dadri, Rewari and Jhajjar. For improving the slums, the Rajiv Awas Yojana (RAY) was implemented in Faridabad, Gurgaon, Rohtak and Panipat. Another programme called the Rajiv Rinn Yojana (RRY) was implemented for urban poverty alleviation so that the urban poor/slum dwellers could improve their living standard. Also, the National Urban Livelihoods Programme (NULM) was also launched in various towns of the state. Many night shelters have been constructed in various towns. Affordable Housing in Partnership (AHIP) was also initiated in Faridabad for rehabilitation of slum dwellers in affordable housing units on a PPP mode. The TCP Department of Haryana has modified its policy for allotment of land/flats to the EWS in the licensed colonies developed by the private colonizers so that its misuse could be checked. All the EWS plots developed by the private colonisers were to be handed over to the Haryana Housing Board at a predetermined rate for allotment to the EWS by the Board. Government of Haryana also initiated an Urban Homeless Policy Haryana 2011, Affordable Housing Policy and Slum in-situ Rehabilitation Policy for improving housing situation in the state. Go Haryana has also been implementing the Pradhan Mantri Awas Yojana (PMAY) as well as the Deen Dayal Jan Awas Yojana (DDJAY). Under DDJAY, 2 lakh houses were to be constructed in the low and medium potential towns of the state

The state of Haryana has experienced a rapid increase in urban population over time, nearly 35 percent of the State's population resides in urban centers as per 2011. However, 25 percent of the urban population of Haryana lives in slums (BPL survey, 2007). The key initiatives taken by Haryana government for housing sector was



earmarking of 25% of the budget for the urban poor in all ULBs and earmarking of 25% of the gross area for EWS Housing under the land pooling scheme of ULBs. The state government also enforced a condition of allotting 20% of the number of plots in the colony to EWS category of persons having a family income up to the prescribed limit. This condition was enforced while granting a license for development of any residential colony by a private developer under Haryana Urban Development and Regulations of Urban Areas Act 1975. In the case of Haryana sub-region, the HUDA has been a major player in the shelter provision process, mostly through plotted developments in various towns. Further, partnerships with developers in terms of licenced colonisation has been a major contributor. However, both these forms of shelter provision have been catering to the upper income groups only. It is only in the recent past that the Government of Haryana has come out with a policy for Affordable Housing so as to down market housing products. A large number of affordable housing projects have started to come up in the Haryana sub-region of the NCR.

Haryana has policies to address the issue of affordable housing and adequate transport infrastructure has also been planned. Deen Dayal Yojna is for affordable plot development. Government came up with 05 acre of land bank and hoping to get a good response. Haryana also has the Affordable Group Housing with cost ranging from 18-22 lakhs. The broad aspects of land planning and development for Haryana are as under:

- a) T&CP Department of Haryana prepared the land uses and regulates by way of licensing and granting change of land use permissions. The infrastructure part in such planned areas created by HUDA (HSVP).
 - b) Required land acquisition is done by Urban Estate Department.
 - c) ULB Department is are different from T&CP.
 - d) Particular areas are declared as a Controlled area as per the State Act and it is mandatory for the Government to prepare Development Plan of that area within one year. The draft plan is prepared by town planners then submitted to Government and thereafter technical comments requested from concerned District Level Authorities. After it is passed by the District Level Committees, it is sent to State Level Committees chaired by the Hon'ble Chief Minister, and thereafter put up for suggestions and objections from the public. And then finally it is approved. When the Development Plan is in place the licensing is done by the T&CP Department.
 - e) There are some areas where individual want to have change of land use for their individual land. There are different policies for the change of category of land. In agriculture land land use is restricted, as only some category of educational institutions on particular approach road is allowed.
- ii) **Uttar Pradesh Sub Region** - The RAY and IHSDP have been implemented in the state of Uttar Pradesh. The Government of Uttar Pradesh has enacted several policies viz. State Housing Policy 2009, State Housing Policy for EWS and LIG, 2011, State Housing Policy for Urban Villages, 2011, Manyavar Shri Kanshiramji Shahari Garib Awas Yojana and the Manyavar Shri Kanshiramji Shahari Dalit Bhulya Basti Samagra Vikas Yojana. These have been implemented in various towns of the state. In addition, in order to encourage investments from the private sector, several township policies have been initiated viz. Integrated Township Policy 2005, Hi-Tech Township Policy 2007 and the New Township Policy 2009. In addition, the development authorities and the UPHDB have also been providing housing for various sections of the society. In the UP sub Region, the UPHDB as well as the private developers have been prime players in providing housing. Several state and central government policies have also been implemented. Many PPP models have also emerged here. Several townships with private real estate developer participation have been launched in the state of Uttar Pradesh, particularly in the NCR sub region.
- iii) **Rajasthan Sub Region** – In the state of Rajasthan, several central and state government policies have been implemented. The RAY was implemented in the city of Alwar which is a part of the Rajasthan sub region. The Government also enacted a Rajasthan Slum Development Policy in the year 2012 under which basic civic and social infrastructure and amenities and housing including rental housing and transit housing was to be provided. Under Integrated Housing and Slum Development Programme (IHSDP), slum dwellers were to be provided



shelter and basic infrastructure. Besides construction of houses, infrastructure development including roads, drains, toilets, sewerage systems, street lights, water supply lines, etc. were to be provided. Another programme called the Mukhya Mantri Shahari BPL Awas Yojana was launched by the Government of Rajasthan in the year 2012-13. Under this scheme, 1 lakh BPC families were to be benefitted by providing subsidy for construction of houses. In terms of night shelters for the homeless, 3 night shelters were constructed in the town of Alwar. The Rajasthan Housing Board has been constructing houses for the EWS and LIG and has added a substantial number of dwelling units. As per the Habitat policy of Rajasthan, more than 80% of housing shortage is for EWS and LIG categories. State Urban Agenda for Rajasthan is also prepared having provisions for the vision of making the state a slum free state in five years. This was proposed to be achieved by using the TDR tool and reserving 10-15% of developed land area or 20-25% of FAR whichever is more for EWS and LIG. Various provisions made for increasing the land supply by land acquisition through settlement/negotiation, the Government of Rajasthan made following options: i) If the land is surrendered by the owner free of cost to Government, the owner gets maximum 20% residential and 5% commercial developed area in the same scheme. ii) If it is not possible to allot land in the same scheme area the owner gets cash in compensation. The state government also introduced incentives as low registration fee for registration of properties and incentives for registration the property in name of women in the household¹. In the Rajasthan sub-Region, the RHB has been the major player for housing development. In addition, the urban local bodies have also been playing a major role in implementing various housing policies of the state as well as the central government. Private real estate developers also have a crucial role to play in supplying housing in various towns. Rajasthan also has several variations of PPP models for developing housing. As regard Housing, Rajasthan Township Policy 2010 is in force in the State including Rajasthan sub-region. Also, a new policy has been prepared after review of existing policy and incorporating learnings from the past experiences, feedback from various stakeholders and new policy initiatives by the Government of India. This policy is named as “Chief Minister’s Jan Awas Yojna-2015”. Under the CM Jan Awas Yojna 2015, out of 624 dwelling units have been proposed under two projects of affordable Housing in SPM Nagar and SPZ scheme. Of 624 dwelling units, 528 dwelling units have been proposed for EWS housing and 96 dwelling units have been proposed for LIG housing. The target of providing 5000 dwelling units has been taken up by UIT, Bharatpur. In terms of night shelters for the homeless, 04 night shelters are being operated in the Bharatpur city by Nagar Nigam, Bharatpur. The Rajasthan Housing Board has also been constructing houses for the EWS and LIG segment and has added a substantial number of dwelling units.

- iv) **NCT Delhi:** Due to difficulty in land acquisition, open land pooling model has been adopted in Delhi. The owners/group of owners can pool land parcels of any size for development as per prescribed norms and guidelines based on sectors as delineated in ZDPs. The Land Pooling Policy for Delhi mandates that each sector will have a 60:40 ratio with 60% of the land to be developed by Land owners/consortium for residential, commercial, partly Public Semi Public (PSP) land uses and 40% of the land to be used for various city level infrastructure requirements including roads, greens, PSP facilities, development of utilities i.e. water, sewerage, electricity etc. with involvement of private sector. Concept of TDR based development is also another option for the areas where land acquisition is difficult. In Delhi first TDR based project has been announced at Karkardoma project, where good housing schemes are proposed. Another model for development, adopted was Redevelopment Model. Core areas of Delhi are getting older day by day and about 40% of the housing demand can be catered within Delhi by redevelopment. Redevelopment for cities like Delhi can have two important things first is to have an optimal mix of volunteer redevelopment and mandatory redevelopment. The second important component will be incentivizing the redevelopment.

In the participating states of Delhi, Uttar Pradesh, Haryana and Rajasthan, the major stakeholders providing housing/ implementing state/central government housing policies are as per **Table D-8.1.2**

¹<https://www.pdpu.ac.in/downloads/SPM-JEM2020Chapter4.pdf>



Table D-8.1.2: Major stakeholders providing housing/ implementing state/ central government housing policies.

S. No.	State	Parastatal Agencies	State / Central Government	Private Developers	Cooperatives	Others
1	Delhi	DDA, DUSIB, DSIIDC	Govt. of India/ Govt. of NCT of Delhi	Pvt. Developers	Cooperatives	Individuals and Others
2	Uttar Pradesh	UPHDB, and Development Authorities, ULBs	Govt. of Uttar Pradesh	Pvt. Developers	Cooperatives	Individuals and Others
3	Haryana	Haryana Shahari Vikas Pradhikaran (HSVP), HHB, Development Authorities, ULBs	Govt. of Haryana	Pvt. Developers	Cooperatives	Individuals and Others
4	Rajasthan	RHB, UIT, ULBs	Govt. of Rajasthan	Pvt. Developers	Cooperatives	Individuals and Others

Annexure-D-8.2

A FEW LAND SUPPLY MODELS IN INDIA

Different States in India² have formulated Land Supply Models Keeping in focus the land requirements for urban poor. Some of the Models are as below:

1. T.P. Scheme (The Gujarat Model)

- a) In India, the Bombay Town Planning Act of 1915 allowed the use of LPR in the form of Town Planning Schemes (TPS) in the erstwhile Bombay Presidency. Later, it became the basis of the TPS enabling act in Gujarat - the Gujarat Town Planning and Urban Development Act (GTPUDA), 1976.
- b) Town Planning Scheme is being followed as an alternative method to assemble the land for urban development activities in a faster and financially affordable manner without taking recourse to compulsory acquisition of land. Town Planning Scheme (TPS) is in operation in some of the states of Indian Union in the form of plot reconstitution. It is an area planning technique patterned on the concept of land readjustment.
- c) Gujarat adopted the Town Planning Scheme (TPS) to expedite the process of land development, which was constrained by the then existing method of land acquisition and development as it was both time consuming and expensive because of legal problems and the heavy compensation the local authorities has to pay to land owners. To overcome such difficulties the state adopted the technique of land pooling (followed in Eastern Asia by Japan, South Korea and Taiwan), whereby irregular plots of land are pooled together, serviced and reconstituted into systematic plots before returning a proportion of improved land to the owners. It was believed that with less of financial transactions, this technique of land development would work out to be faster and cheaper. For the satisfaction of the land owners, the method involved a kind of community participation in which the judgment of the owners was sought at all stages of development.
- d) The TPS process does not settle land ownership disputes; it just transfers them to the newly reconstituted plot, thereby not holding up the TPS approval process. As a result, TPS has become the predominant urban expansion tool in all the major cities in Gujarat. For example, Ahmedabad Urban Development Authority (AUDA) has prepared over 109 schemes and Ahmedabad Municipal Corporation (AMC) has prepared about 61 schemes in the last 4 decades.
- e) Apart from Gujarat and Maharashtra, a few other states, notably Andhra Pradesh, Karnataka, Punjab and Kerala have TPS-enabling legislation, albeit with little use of the mechanism. Instead of using TPS, Punjab only permits conversion of large parcels of agricultural land to urban use. For example, a 100 hectare agricultural land may be allowed conversion if 45% is used for public facilities and infrastructure, and the remaining 55% for residential use.

2. Land readjustment / pooling Model

Land re-adjustment is a process whereby a public authority assembles numerous small parcels of raw land without paying compensation to the owners. The authority then sub-divides such assembled lands for urban use returning most of the building sites to the original owners in proportion to the value of their land contribution and permitting them the right of alienating such sites. The authority retains a portion of the assembled lands, applying them partly to provide civic amenities such as roads, parks and gardens or schools, and the remainder land for public sale to recover the cost of development. Thus, land re-adjustment acts as tool to achieve unified control over large areas of land and as an instrument of financing public service installations in the process of planned urban growth.

²http://www.ijirset.com/upload/2014/september/37_Study.pdf



3. Guided Urban Development Model

The concept of Guided Urban Development (GUD) emerged in response to ad hoc, uncontrolled urban development with no regard to infrastructure services. It also aims to secure a limited availability of urban land for economically weaker sections. GUD had been applied in Chennai under the World Bank-assisted Tamil Nadu Urban Development Project by Chennai Metropolitan Development Authority (CMDA). The objectives of the scheme are as follows:

- a) Ensure provision of serviced plots for low income families at affordable prices (approximately 75% of total plots to be reserved for EWS / LIG); and
- b) Provide incentives to the land owner / private developer to participate in the provision of low income shelter by guaranteeing fair return on investments (profit of 20-30%).

4. Joint Development Model

Under a legislative act in the state of Haryana, certain planned areas are designated to allow private developers to assemble parcels of land. The act provides for the licensing of private developers to purchase land directly from land owners and develop such lands for residential purpose according to the conditions, which include:

- a) Reservation of 20% of the developed residential plots for EWS and LIG category and their allotment as per prices and norms set by HUDA (Haryana Urban Development Authority);
- b) Sale of another 25% plots on no profit no loss basis; and
- c) Remaining 55% plots to be priced and sold directly by the developer. Initially, the model started with the plotted development, but over time it has shifted to apartments. The joint development approach has been extensively applied in Gurgaon.

4.1 The Haryana Development and Regulation of Urban Area Act (HDRUAA), 1985 provide for certain planned areas to be specially designated to allow private developers to assemble parcels of land. In designated areas, the act provides for the licensing of private developers to assemble land directly from landowners and develop such land for residential purposes according to stipulation which include (financial contributions to the development authority for attributable off-site infrastructure costs); and the reservation of a portion of the developed land for lower-income housing to be allotted through the development authority. Haryana State, with the enactment of the Act (HDRUAA) in 1975, became the only State in India to formally involve the corporate private sector in the acquisition, development, and disposal of urban land. The act and its 1981 bylaws stipulate that private developers must first apply for a license from the State Director of Town Planning, stating the details of the land. The land must be within a township/city development scheme, which has been prepared by the Haryana Urban Development Authority (HUDA) and sanctioned by the State. The developer must also prove that he is bonafide and “has a good track record”. The license granted has mandatory provisions, such as:

- a) The developer must pay external development charges to HUDA on a gross area basis (net m2 bases for water) to cover the off-site infrastructure costs.
- b) The developer must reserve an additional 25 percent of created plots to be sold on a “no-profit no-loss” basis.
- c) The developer must pay other servicing/administrative costs to HUDA on a net m2 bases.
- d) The developer must build certain community facilities and / or provide land for such free of charge.
- e) The developer must put 30 percent of the proceeds of land sales into a separate account to be used for development.
- f) The developer must maintain the completed colony for five years.
- g) The developer must return any excess profit to the state (a ceiling of 15 percent profit on total project costs is imposed).



- h) To ensure compliance with these conditions the developer must take out a bank guarantee in favour of HUDA.

5. **Transfer of Development Rights (TDR) Model**

- a) In determining the 'fair price of land' to be acquired, Governments generally try to rely on the past records of sales transactions. These are rarely reported or recorded correctly since transaction taxes are high and the role of 'black money' in the economy is large. Today, Local Bodies or the State Governments do not have adequate funds to acquire the necessary land even at the recorded low rates. A pragmatic solution to this problem could be the use of 'Transfer of Development Rights'. The Urban Development Plans Formulation and Implementation (UDPFI) Guidelines, MOUD, Government of India (1996), define Transfer of Development Rights (TDRs) as, 'Development Right to transfer the potential of a plot designated for a public purpose in a plan, expressed in terms of total permissible built space calculated on the basis of Floor Space Index or Floor Area Ratio allowable for that plot, for utilization by the owner himself or by way of transfer by him to someone else from the present location to a specified area in the plan, as additional built up space over and above the permissible limit in lieu of compensation for the surrender of the concerned plot free from all encumbrances to the Planning and Development Authority'. Mumbai is the first city in India, which has adopted the TDR concept in a regulated manner as an alternative mechanism for land acquisition for providing the essential amenities in accordance with the development plan proposal, for slum redevelopment and urban renewal through reconstruction of dilapidated buildings.
- b) Under the TDR concept, the development potential of a plot of land partly or fully reserved for public purpose can be separated from the land itself and be made available to the owner of the land by way of TDR in the form of Floor Space Index. Such award entitles the owner a Development Right Certificate (DRC), which he may himself use or transfer to another person. If the FSI granted cannot be used on the land not covered by acquisition, the landowner is free to use the additional FSI on the lands located in other parts of the city. This way the exorbitant costs of acquisition of urban land for public purpose can be met by a system of compensation in kind rather than in cash.

6. **Accommodation Reservation Model³**

The land owner can develop the facility for which the land is reserved (such as a library), hand it over to the Mumbai Municipal Corporation (BMC) free of cost and then utilize the development right equivalent to the full permissible FSI for his own purpose. In case of Mumbai, this measure is likely to succeed as land prices are several times higher than construction cost. But where land prices are not that high or are less than construction cost such a measure is unlikely to succeed.

³<https://www.ijser.org/researchpaper/Urban-Land-Management-and-Planning.pdf>



DEFINITION OF AFFORDABLE HOUSING

1. There is no clear-cut definition of the term “affordable”, as it is a relative concept. Even, “affordability” as a concept is very generic and could have different meanings for different people of differences in income levels.
2. Different agencies and countries have defined “affordable housing” as the economic potential of an individual to buy a house. In US and Canada, a commonly accepted guideline for affordable housing is that the cost of housing should not be more than 30% of a household’s annual income, including taxes and insurance for owners and utility costs. If for a home, the monthly carrying costs that include not only the loan repayment, but also other factors including property taxes, payments of basic utilities such as water, electricity, cooking fuel, etc. and basic services such as internet, cable, etc. exceed 30-35% of monthly household income, the housing could be considered unaffordable for that household. However, this figure provides only a base of housing affordability; the definition of affordability varies according to a household’s individual circumstances.
3. Even in India, the Reserve Bank of India (RBI) had tweaked the affordable housing definition in July 2014. According to RBI the cost of a house now could be INR 6.5 million and INR 5 million in the metros and non-metros, respectively, to be qualified as affordable housing. The RBI also said that it will periodically review the definition of affordable housing, on account of inflation.
4. The task force on promoting Affordable Housing of MHUPA (now MoHUA) had defined affordable housing as - “Affordable housing refers to any housing that meets some form of affordability criterion, which could be income level of the family, size of the dwelling unit or affordability in terms of EMI size or ratio of house price to annual income” (refer **Table D-8.3.1**). While the first two parameters are independent of each other, the third is a dependent parameter that can be correlated to income and property prices. Income levels help in differentiating among people with expenditure potential, the size of units assist in maintaining a minimum level of liveable space.
5. Another important facet of the affordable housing definition is that all of them ideate a universal definition across the vast country of India. The country does not only have urban areas of different stature, but also the income levels are different across the country. The prominent developer in Indian affordable housing context, Value and Budget Housing Corporation (VBHC) offers 1 BHK units under INR 1.6 million in Bengaluru and INR 1.8 million in Vasind (Mumbai), while the location of Mumbai project is 40 minutes’ drive from Thane. The definition of affordable housing varies from place to place whereas it may vary for different projects in the city also.

Table D-8.3.1: Definition of Affordable Housing

Income Categories	Size	Income Criteria	Affordability
EWS	21-27 sqm of carpet area EWS maximum area could be between 25.2 and 30.8 sqm if subsidies are tied to them	The maximum Household Income for the EWS and LIG category are recommended to be INR 8,000 and INR 16,000 per month and since many households in this category do not have regular monthly income an annual income of INR 100,000 for EWS and INR 200,000/- for LIG households could also be used	The Task Force recommended that the desirable goal of a house price to income multiple that should be pursued for Affordable Housing projects should be 5.
LIG	28-40 sqm of carpet area maximum area for LIG could be between 36.9 and 45.1 sqm if subsidies are tied to them		
MIG	41-60 sqm of carpet area		

Source: Task force on Promoting Affordable Housing, MHUPA (now MoHUA), 2012

Further, definition of Affordable Housing suggested by JLL and REIS in 2016 is at **Table D-8.3.2**.



Table : D-8.3.2: Definition of Affordable Housing suggested by JLL and REIS in 2016

Income Categories	Minimum Volume of Habitation	Provision of Basic Amenities	Cost of the House	Location of the House
EWS	• 250 sq ft carpet area • 2,250 cu ft internal volume	• sanitation, adequate water supply and power	• cost of the house such that EMI does not exceed 30-40% of net monthly income of the buyer	• located within 20 km of a major workplace hub (could be suburban hubs as well) in the city
LIG	• 300–600 sq ft carpet area • 2,700–5,400 cu ft internal volume	• provision of community spaces and amenities such as parks, schools and healthcare facilities, either within the project or in the neighbourhood, depending upon the size and location of the housing project	• reasonable maintenance costs	• adequately connected to major public transport system
MIG	• 600–1,200 sq ft carpet area • 5,400–10,800 cu ft internal volume			

Source: JLL Research and REIS, 2016



SOME GLOBAL AFFORDABLE HOUSING PRACTICES

A. Built to Rent Model⁴ (London)

1. To qualify as a Build to Rent scheme, all the following criteria must be met:
 - a) the development, or block or phase within the development has at least 50 units
 - b) the homes are held as Build to Rent under a covenant for at least 15 years
 - c) a claw-back mechanism is in place to recoup additional affordable housing contributions in the event of the covenant being broken
 - d) all the units are self-contained and let separately
 - e) there is unified ownership and unified management of the development
 - f) longer tenancies (three years or more) are available to all tenants. These should have break clauses for renters, which allow the tenant to end the tenancy with a month's notice any time after the first six months
 - g) the scheme offers rent certainty for the period of the tenancy, the basis of which should be made clear to the tenant before a tenancy agreement is signed, including any annual increases which should always be formula-linked
 - h) there is on-site management, this does not necessarily mean full-time dedicated on-site staff, but all schemes need to have systems for prompt resolution of issues and some daily on-site presence
 - i) providers have a complaints procedure in place and are a member of a recognised ombudsman scheme
 - j) providers do not charge up-front fees of any kind to tenants or prospective tenants, other than deposits and rent-in-advance.
2. Benefits of Build to Rent developments can make a positive contribution to increasing housing supply and are beneficial in a number of ways. They can:
 - a) attract investment into housing market that otherwise would not exist
 - b) accelerate delivery on individual sites as they are less prone to 'absorption constraints' on build-out rates
 - c) deliver more readily across the housing market cycle as they are less impacted by house price downturns
 - d) provide a more consistent and at-scale demand for off-site manufacture
 - e) offer longer-term tenancies and more certainty over long-term availability
 - f) ensure a commitment to, and investment in, place-making through single ownership provide better management standards and better quality homes than much of the mainstream private rented sector.

B. City of Sydney- Affordable Rental Housing Strategy 2009 - 2014

The aim of the City of Sydney Affordable Housing Strategy is to protect existing affordable housing and to facilitate new affordable housing in the City of Sydney to provide for social, cultural, environmental and economic sustainability. The City has a social, practical and legislative responsibility to address local housing needs on behalf of the community and that access to secure, appropriate and affordable housing is not only a basic requirement for all people, but also an essential component of an inclusive, dynamic and sustainable city.

The cost of housing in the Local Government Area (LGA) largely precludes very low, low and moderate income households from accessing housing appropriate to their needs and their income. It is therefore essential that the City facilitates the provision of affordable housing to the extent of its capabilities.

Increased levels of affordable housing cannot be achieved without the active participation of other levels of government, the not-for profit sector and the private sector. Moreover, the issues influencing housing affordability

⁴Adopted from London Plan



and the provision of affordable housing are regional issues and that such issues may not be fully addressed in isolation from other councils.

i) **Key Considerations:**

- Social, cultural and environmental impacts of decreasing housing affordability on the individual and the larger community.
- Economic impacts of decreasing housing affordability on the LGA's economy.

Objectives and Actions:

The City to focus on six key objectives:

1. **Increase the amount of affordable housing**

Demonstration project; Utilising the NSW planning system; Facilitate affordable student housing Working with financial institutions; Affordable housing quick path; Contribution of City resources

2. **Protect the existing stock of low cost accommodation**

Research and monitoring; Consistent approach to the application of the Affordable Rental Housing SEPP in the inner city Sydney; Financial incentives; Collaborate with owners of low cost accommodation

3. **Encourage a diverse housing stock**

Review appropriate dwelling size mix ; Ensure planning supports culturally appropriate housing ; Review planning provisions for secondary dwellings

4. **Collaborate with other councils**

Provide leadership in affordable housing research, projects and policies; Establish working groups with inner city Sydney councils; Develop training programs

5. **Advocate for improved housing outcomes**

Community education; Advocate to improve social housing outcomes; Advocate to improve Indigenous housing outcomes; Liaise with the Aboriginal Housing Company; Advocate to improve funding to the not-for-profit sector; Advocate to increase participation of private sector; Through CCCLM (Council of Capital City Lord Mayors), advocate affordable housing matters to the Commonwealth Government.; Commonwealth and NSW Governments' incentives for boarding houses; Advocate for a whole of government approach; Advocate for affordable housing in NSW Government controlled urban renewal sites

6. **Implement, evaluate and monitor the affordable housing strategy**

Affordable Housing Officer; Monitor existing affordable housing; Annual review of strategy, Maintain existing research; Ongoing research Strategy identifies the need to increase the supply of affordable rental housing stock by nearly 8,000 by 2030.

ii) **Planning tools**

There are a number of planning mechanisms, such as affordable housing levies and the Affordable Rental Housing State Environmental Planning Policy (SEPP), that may be utilised to protect existing affordable housing and to facilitate additional affordable housing.

iii) **Strategic Partnerships**

The issues influencing the provision of affordable housing can not be addressed solely by local government. It is essential that councils develop working partnerships with the not-for-profit sector, the Commonwealth Government and NSW Government, the private sector, other councils and the financial sector in order to protect existing affordable housing and to facilitate additional affordable housing.



iv) **Financial Initiatives**

It is possible that a council may allocate money to facilitate more appropriate and affordable housing for very low to moderate income earners. Funds may be used to offer a range of ‘carrot’ incentives to be offered to the private sector to encourage the provision of affordable housing. Such incentives may include:

- reducing development contributions for developers willing to provide affordable housing;
- spreading charges, e.g. infrastructure charges and DA fees, as a way of reducing up-front costs of development that provide affordable housing;
- rate rebates on properties where affordable housing is provided or to rental properties with low income tenants;
- providing land to affordable housing providers through donation or by deferring payment so that the upfront costs of development are lowered; or

v) reducing rates or offering rebates for owners of boarding houses so as to provide an incentive for their retention.

vi) **Leadership, advocacy and community development**

Councils, both individually and in partnership with stakeholders and the not-for-profit sector, are able to advocate to other levels of government for improved housing outcomes for people on very low to moderate incomes.

Councils may work with members of the community to educate them on the overall benefits of providing affordable housing in the LGAs. Where community members and stakeholders are involved in the planning of affordable housing there is greater opportunity to enhance the general understanding of the importance of affordable housing.

It is important to monitor housing trends in LGAs and surrounding LGAs so that housing policies can remain responsive to change. Further, ongoing research of best practice and national and international affordable housing initiatives will inform the ongoing provision of affordable housing

vii) **Sustainable Sydney 2030**

Sustainable Sydney 2030 is a 25 year strategic plan that will deliver an overarching framework for the development of the LGA over the next two decades. Sustainable Sydney 2030 poses an agenda beyond the immediate and looks to the City’s long term goals. Its effective implementation relies on partnerships being established with the NSW Government, the Commonwealth Government, other local councils, business and the community. Sustainable Sydney 2030 has included ‘Housing for a Diverse Population’ as a key strategic direction for the City of Sydney.

During the extensive community consultation that has been undertaken as part of Sustainable Sydney 2030, the community informed that that they would like to see the LGA as affordable, inclusive and accessible for all residents. Therefore, relative equality has emerged as a key principle in Sustainable Sydney 2030. The provision of affordable housing is a means of providing for increased relative equality in the LGA. As part of its commitments in Sustainable Sydney 2030, the City, in demonstration of how affordable housing may be developed in partnership with other levels of government, the not-for-profit sector and the private sector, to explore a project to showcase the benefits of affordable housing in the LGA. Sustainable Sydney 2030 establishes an ambitious target that by 2030, of all housing in the LGA 7.5% will be social housing and 7.5% will be affordable housing delivered by ‘not-for-profit’ or other providers. This target seeks to increase the current proportion of social and affordable housing in the City by a modest amount.

viii) **City of Sydney Social Plan 2006-2010**

The City of Sydney Social Plan 2006–2010 recognises that the City has a social, practical and legislative responsibility to address local housing needs on behalf of the community. The Social Plan identifies the need to provide appropriate and affordable housing in the LGA to support a diverse range of households on a variety of incomes and acknowledges that diversity contributes to greater economic stability and enhances the vitality of a local community.



ix) **The Council of Capital City Lord Mayors Affordable Housing Policy**

The Council of Capital City Lord Mayors (CCCLM), of which the City of Sydney is a member, adopted the Council of Capital City Lord Mayors Affordable Housing Policy in 2007. The Policy recognises that capital cities have significant involvement in the direct provision of public and social housing, the development and implementation of planning policies, researching and monitoring housing affordability and supporting not-for-profit organisations in the provision of housing services. Capital cities also facilitate and encourage the provision of housing by the private sector via a range of incentives as well as playing an important advocacy role with all other levels of government.

The CCCLM aims to work closely with each level of government in gaining commitment, cooperation and investment to ensure an adequate supply of affordable housing and a mix of housing types are available in each capital city.

x) **Sydney Metropolitan Strategy**

The Sydney Metropolitan Strategy is the NSW Government's long-term plan to manage Sydney's continuing economic growth while balancing social and environmental impacts. The Strategy identifies a number of initiatives to improve the affordability of housing, to facilitate the development of affordable housing and to redevelop and regenerate Housing NSW stock. Specific initiatives include:

- C4.1 Improve the affordability of housing.
- C4.2 Redevelop and regenerate Department of Housing stock.
- C4.3 Use planning mechanisms to provide affordable housing.

With projections of a 1.1 million population increase in the Sydney metropolitan region in the next 25 years, the Sydney Metropolitan Strategy identifies the need for an additional 640,000 dwellings of which 55,000 are to be provided in the City of Sydney.

xi) **Sydney Subregional Strategy**

The Metropolitan Strategy identified ten Sydney subregions of which the City of Sydney LGA comprises a sub-region on its own. The strategy includes three actions towards improving the affordability of housing including:

- Improve the affordability of housing
- Redevelop and regenerate Department of Housing stock; and
- Consider potential planning mechanisms to provide affordable housing

xii) **Other Local Policies and Plans**

There are a number of City of Sydney documents relevant to this Strategy, including:

- Sydney Local Environmental Plan (LEP) 2005
- South Sydney LEP 1998
- Leichhardt LEP 2000
- Green Square Affordable Housing Development Control Plan (DCP) 2002
- City of Sydney Boarding Houses Development Control Plan 2004
- Homelessness Strategy 2007-2012

The City is currently undertaking a review of its planning controls. The City Plan will comprise a single LEP and a single DCP for the whole LGA and will replace the above LEPs and DCPs.

xiii) **Environmental Planning and Assessment Act 1979**

The Environmental Planning and Assessment Act 1979 (EP&A Act) and the Environmental Planning Regulation 2000 regulate the planning and development assessment functions of councils. The 'provision and maintenance of affordable housing' is a specific objective of the EP&A Act.

The detailed strategy may be accessed at:

<https://www.cityofsydney.nsw.gov.au/strategies-action-plans/affordable-rental-housing-strategy>



NCR HOUSING SCENARIO

Table D-8.5.1: Sub-Region/ District wise Demand and Supply Gap of Houses, 2011 Census

Sl. No.	Sub-region	District	Urban/ Rural/ Total	Total Number of Households as per HH Series	Total no. of census houses available	Total Occupied houses	No. of houses primarily used for residential purpose	Total no of Vacant houses	Total Dilapidated Houses	Total Dwelling Units available (5+6-7)	Housing demand/ excess (8-2)
		1		2	3	4	5	6	7	8	9
1	NCT Delhi	All Districts	Urban	32,61,423	44,81,133	39,90,998	31,01,095	4,90,135	90,477	35,00,753	2,39,330
			Rural	79,115	1,24,422	1,01,866	75,234	22,556	2,980	94,810	15,695
			Total	33,40,538	46,05,555	40,92,864	31,76,329	5,12,691	93,457	35,95,563	2,55,025
2	Haryana	Bhiwani	Urban	63,051	99,235	88,442	60,053	10,793	2,759	68,087	5,036
			Rural	2,45,761	3,57,047	3,27,818	2,17,566	29,229	13,134	2,33,661	-12,100
			Total	3,08,812	4,56,282	4,16,260	2,77,619	40,022	15,893	3,01,748	-7,064
3		Jind	Urban	57,523	89,665	81,748	52,782	7,917	1586	59,113	1,590
			Rural	1,87,059	2,78,335	2,60,848	1,33,949	17,487	9267	1,42,169	-44,890
			Total	2,44,582	3,68,000	3,42,596	1,86,731	25,404	10853	2,01,282	-43,300
4		Karnal	Urban	90,548	1,35,920	1,24,034	86,468	11,886	2,341	96,013	5,465
			Rural	1,94,003	2,92,682	2,76,027	1,68,739	16,655	9,543	1,75,851	-18,152
			Total	2,84,551	4,28,602	4,00,061	2,55,207	28,541	11,884	2,71,864	-12,687
5		Mahendragarh	Urban	23,290	44,216	38,445	22,121	5,771	643	27,249	3,959
			Rural	1,45,235	2,23,726	2,01,238	1,29,000	22,488	4,489	1,46,999	1,764
			Total	1,68,525	2,67,942	2,39,683	1,51,121	28,259	5,132	1,74,248	5,723
6		Panipat	Urban	1,05,466	1,53,804	1,39,175	98,721	14,629	3,039	1,10,311	4,845
			Rural	1,14,922	1,73,502	1,58,593	94,822	14,909	4,781	1,04,950	-9,972
			Total	2,20,388	3,27,306	2,97,768	1,93,543	29,538	7,820	2,15,261	-5,127
7		Sonapat	Urban	89,372	1,33,576	1,20,552	84,327	13,024	3,070	94,281	4,909
			Rural	1,80,286	2,83,858	2,57,431	1,51,650	26,427	8,446	1,69,631	-10,655
			Total	2,69,658	4,17,434	3,77,983	2,35,977	39,451	11,516	2,63,912	-5,746
8		Rohtak	Urban	87,427	1,31,739	1,17,172	82,787	14,567	2,343	95,011	7,584
			Rural	1,15,506	1,75,203	1,60,739	95,307	14,464	5,483	1,04,288	-11,218
			Total	2,02,933	3,06,942	2,77,911	1,78,094	29,031	7,826	1,99,299	-3,634
9		Jhajjar	Urban	49,060	78,328	68,192	46,680	10,136	2,201	54,615	5,555
			Rural	1,34,340	2,11,816	1,89,621	1,18,822	22,195	6,543	1,34,474	134
			Total	1,83,400	2,90,144	2,57,813	1,65,502	32,331	8,744	1,89,089	5,689
10		Rewari	Urban	42,867	69,305	60,649	40,443	8,656	1,049	48,050	5,183
			Rural	1,26,261	1,99,449	1,79,795	1,08,431	19,654	4,124	1,23,961	-2,300
			Total	1,69,128	2,68,754	2,40,444	1,48,874	28,310	5,173	1,72,011	2,883
11		Gurgaon	Urban	2,32,629	3,81,988	3,04,432	2,24,323	77,556	9,115	2,92,764	60,135
			Rural	88,013	1,41,703	1,21,180	80,118	20,523	2,860	97,781	9,768
			Total	3,20,462	5,23,691	4,25,612	3,04,441	98,079	11,975	3,90,545	70,083
12		Mewat	Urban	19,759	36,237	32,163	18,901	4,074	940	22,035	2,276
			Rural	1,37,261	1,87,398	1,80,003	1,31,459	7,395	12,329	1,26,525	-10,736
			Total	1,57,020	2,23,635	2,12,166	1,50,360	11,469	13,269	1,48,560	-8,460
13		Faridabad	Urban	2,92,751	3,82,981	3,53,146	2,77,693	29,835	7,136	3,00,392	7,641
			Rural	60,315	87,700	82,239	56,304	5,461	2,619	59,146	-1,169
			Total	3,53,066	4,70,681	4,35,385	3,33,997	35,296	9,755	3,59,538	6,472



Sl. No.	Sub-region	District	Urban/ Rural/ Total	Total Number of Households as per HH Series	Total no. of census houses available	Total Occupied houses	No. of houses primarily used for residential purpose	Total no of Vacant houses	Total Dilapidated Houses	Total Dwelling Units available (5+6-7)	Housing demand/ excess (8-2)
		1		2	3	4	5	6	7	8	9
14		Palwal	Urban	40,645	63,090	56,812	38,390	6,278	1,465	43,203	2,558
			Rural	1,27,165	1,86,069	1,75,519	1,17,698	10,550	7,990	1,20,258	-6,907
			Total	1,67,810	2,49,159	2,32,331	1,56,088	16,828	9,455	1,63,461	-4,349
Haryana Sub-Region			Urban	11,94,388	18,00,084	15,84,962	11,33,689	2,15,122	37,687	13,11,124	1,16,736
			Rural	18,56,127	27,98,488	25,71,051	16,03,865	2,27,437	91,608	17,39,694	-1,16,433
			Total	30,50,515	45,98,572	41,56,013	27,37,554	4,42,559	1,29,295	30,50,818	303
15	Uttar Pradesh	Meerut	Urban	3,00,446	4,22,303	3,85,936	2,78,748	36,367	6,314	3,08,801	8,355
			Rural	2,68,299	3,81,520	3,61,247	2,14,353	20,273	10,922	2,23,704	-44,595
			Total	5,68,745	8,03,823	7,47,183	4,93,101	56,640	17,236	5,32,505	-36,240
16		Baghpat	Urban	44,279	69,991	62,928	40,196	7,063	1,393	45,866	1,587
			Rural	1,62,811	2,46,055	2,25,152	1,29,969	20,903	5,249	1,45,623	-17,188
			Total	2,07,090	3,16,046	2,88,080	1,70,165	27,966	6,642	1,91,489	-15,601
17		Ghaziabad (incl. Hapur)	Urban	5,87,116	8,36,316	7,31,539	5,58,431	1,04,777	10,325	6,52,883	65,767
			Rural	2,42,727	3,55,407	3,28,581	2,10,778	26,826	8,729	2,28,875	-13,852
			Total	8,29,843	11,91,723	10,60,120	7,69,209	1,31,603	19,054	8,81,758	51,915
18		G.B. Nagar	Urban	2,07,099	3,38,935	2,62,991	2,01,814	75,944	2,603	2,75,155	68,056
			Rural	1,09,179	1,70,835	1,52,154	98,641	18,681	2,597	1,14,725	5,546
			Total	3,16,278	5,09,770	4,15,145	3,00,455	94,625	5,200	3,89,880	73,602
19		Bulandshahar	Urban	1,43,934	2,21,628	2,01,985	1,35,496	19,643	3,993	1,51,146	7,212
			Rural	4,38,742	6,58,449	6,08,417	3,62,701	50,032	18,733	3,94,000	-44,742
			Total	5,82,676	8,80,077	8,10,402	4,98,197	69,675	22,726	5,45,146	-37,530
20		Muzaffarnagar (incl. Shamli)	Urban	2,00,330	2,96,104	2,73,801	1,89,079	22,303	6,440	2,04,942	4,612
			Rural	4,81,057	6,73,746	6,40,013	4,24,491	33,733	22,133	4,36,091	-44,966
			Total	6,81,387	9,69,850	9,13,814	6,13,570	56,036	28,573	6,41,033	-40,354
UP Sub-Region			Urban	14,83,204	21,85,277	19,19,180	14,03,764	2,66,097	31,068	16,38,793	1,55,589
			Rural	17,02,815	24,86,012	23,15,564	14,40,933	1,70,448	68,363	15,43,018	-1,59,797
			Total	31,86,019	46,71,289	42,34,744	28,44,697	4,36,545	99,431	31,81,811	-4,208
21	Rajasthan	Bharatpur	Urban	85,521	1,29,697	1,17,482	80,596	12,215	2,019	90,792	5,271
			Rural	3,38,086	4,79,437	4,61,383	3,24,212	18,054	15,982	3,26,284	-11,802
			Total	4,23,607	6,09,134	5,78,865	4,04,808	30,269	18,001	4,17,076	-6,531
22		Alwar	Urban	1,23,647	2,12,967	1,78,362	1,19,789	34,605	1,964	1,52,430	28,783
			Rural	5,05,266	7,82,294	7,32,426	4,91,193	49,868	18,181	5,22,880	17,614
			Total	6,28,913	9,95,261	9,10,788	6,10,982	84,473	20,145	6,75,310	46,397
Rajasthan Sub-region			Urban	2,09,168	3,42,664	2,95,844	2,00,385	46,820	3,983	2,43,222	34,054
			Rural	8,43,352	12,61,731	11,93,809	8,15,405	67,922	34,163	8,49,164	5,812
			Total	10,52,520	16,04,395	14,89,653	10,15,790	1,14,742	38,146	10,92,386	39,866
NCR			Urban	61,48,183	88,09,158	77,90,984	58,38,933	10,18,174	1,63,215	66,93,892	5,45,709
			Rural	44,81,409	66,70,653	61,82,290	39,35,437	4,88,363	1,97,114	42,26,686	-2,54,723
			Total	1,06,29,592	1,54,79,811	1,39,73,274	97,74,370	15,06,537	3,60,329	1,09,20,578	2,90,986

Source: Housing Census Data Tables, Census of India, 2011

Table D-8.5.2: District Population and Slum Population in NCR, 2011

Sub Region	District	Population 2011	Slum Population 2011	% of slum population to District Population
NCT Delhi	-	167,87,941	17,85,390	10.6
Haryana	14	164,27,524	10,31,946	6.3
Uttar Pradesh	8	187,19,180	14,61,565	7.8
Rajasthan	2	62,22,641	43,567	0.7
NCR	24	581,57,286	43,22,468	7.4

Source: Census of India, 2011



Table – D-8.5.3 : City/Town wise Slum Population in NCR in 2011

S. No.	Sub-region/ City/ Town	Slum-2011	
		No. of HH	Total slum Popu.
1	NCT Delhi	3,67,893	17,85,390
	HARYANA State	3,32,697	16,62,305
2	Nilokheri (MC)	144	756
3	Taraori (MC)	1338	6842
4	Indri (MC)	742	3817
5	Karnal (M Cl + OG)	9481	47802
6	Nissing (MC)	208	1092
7	Assandh (MC)	1334	6836
8	Gharaunda (MC)	2933	15112
9	Panipat (M Cl + OG)	2369	11438
10	Samalkha (MC + OG)	2172	10748
11	Gohana (MC)	1439	7489
12	Ganaur (MC)	1725	9244
13	Sonipat (M Cl + OG)	19033	98508
14	Kharkhoda (MC)	561	2967
15	Narwana (M Cl)	4232	21925
16	Uchana (MC)	275	1375
17	Jind (M Cl)	15319	79433
18	Julana (MC)	960	5171
19	Safidon (MC)	2482	13366
20	Bawanikhera (MC)	1408	7258
21	Bhiwani (M Cl)	3670	18688
22	Siwani (MC)	889	4657
23	Loharu (MC)	769	4356
24	CharkhiDadri (MC)	5123	26107
25	Maham (MC)	755	3761
26	Rohtak (M Cl)	8113	40779
27	Kalanaur (MC)	1376	7325
28	Sampla (MC)	795	4120
29	Bahadurgarh (M Cl)	12917	63933
30	Jhajjar (MC)	2286	11943
31	Mahendragarh (MC)	1440	7554
32	Ateli (MC)	62	370
33	Narnaul (M Cl)	212	1094
34	Rewari (M Cl)	12113	61600
35	Bawal (MC)	551	3304
36	Hailey Mandi (MC)	800	4063
37	Pataudi (MC)	59	326
38	Gurgaon (M Corp. + OG)	30888	144805
39	Farrukhnagar (MC)	602	3113
40	Sohna (MC)	1111	6037
41	Taoru (MC)	2017	11205
42	Nuh (MC)	419	2473
43	Ferozepurjhirka (MC)	1837	11665
44	Punahana (MC)	277	1790
45	Faridabad (M Corp.)	45900	215053
46	Palwal (M Cl + OG)	1876	10373
47	Hathin (MC)	326	2077
48	Hodal (MC)	1306	8196
	Haryana sub-region (Sub-Total)	2,06,644	10,31,946



S. No.	Sub-region/ City/ Town	Slum-2011	
		No. of HH	Total slum Popu.
	RAJASTHAN State	3,94,391	20,68,000
49	Tijara (M)	105	577
50	Khairthal (M)	62	376
51	Alwar (M CI + OG)	682	3799
52	Rajgarh (M)	97	480
53	Nagar (M)	60	337
54	Nadbai (M)	76	393
55	Bharatpur (M CI + OG)	5561	31341
56	Weir (M)	1021	6264
	Rajasthan sub-region (Sub-Total)	7,664	43,567
	UTTAR PRADESH State	10,66,363	62,39,965
57	Noida (CT)	11510	49407
58	Kairana (NPP)	1731	11134
59	Karnawal (NP)	171	1205
60	Sardhana (NPP)	1497	9994
61	Phalauda (NP)	618	3982
62	Hastinapur (NP)	500	2522
63	Mawana (NPP)	1391	8860
64	Meerut (M Corp.)	92034	544859
65	Tikri (NP)	497	3089
66	Doghat (NP)	595	3835
67	Baraut (NPP)	3859	23558
68	Baghpat (NPP)	826	5264
69	Agarwal Mandi (Tatiri) (NP)	66	415
70	Aminagar Sarai (NP)	115	652
71	Khekada (NP)	2329	15359
72	Patala (NP)	314	1865
73	Niwari (NP)	408	2636
74	Modinagar (NPP)	8223	43995
75	Faridnagar (NP)	421	2606
76	Muradnagar (NPP)	726	5394
77	Loni (NPP)	19169	107800
78	Ghaziabad (M Corp.)	63742	333962
79	Dasna (NP)	1767	11633
80	Pilkhuwa (NPP)	5351	31952
81	Hapur (NPP)	14832	91964
82	Dadri (NPP)	1938	10781
83	Bilaspur (NP)	307	1875
84	Dankaur (NP)	392	2384
85	Rabupura (NP)	764	4877
86	Jahangirpur (NP)	421	2394
87	Jewar (NP)	1317	9280
88	Sikandrabad (NPP)	5209	31129
89	Bulandshahr (NPP + OG)	9639	57367
90	Gulaothi (NPP)	93	677
91	Siana (NPP)	1784	11582
92	Dibai (NPP)	1023	6018
93	Shahpur (NP)	235	1131
94	Kandhla (NPP)	633	4128
	Uttar Pradesh sub-region (Sub-Total)	2,55,579	14,61,565
	NCR (Grand Total)	8,37,780	43,22,468

Source: Census of India, 2011



Annexure D-9.1

9. RURAL DEVELOPMENT

Snapshot of Agriculture

1. The NCR is located in the fertile alluvial belts around major rivers including the Doab between Yamuna and Ganga rivers. Out of a total 55,083 sq km area of the NCR, about 44,930 sq km area or 82 percent is under agriculture. (Table D-9.1.1).

Table D-9.1.1: Agriculture Scenarios in India and the National Capital Region

S.No.	Description	India	National Capital Region
1.	Total Arable Land in million hectare	159.0	4.5
2.	Net Irrigated Area in million hectare	66.1	3.6
3.	Net Irrigated Area in percent of total land	*47	79
4.	Rain fed area in percent	*53	21
5.	Projected Population by 2041 in crore	153.0	11.3
6.	Projected food grain demand by 2041 in million tons	450	34

Source: *IARI; India's Demography at 2040: Planning Public Good Provision for the 21st Century (Page 137).

2. The NCR is a metropolitan region with four metropolitan cities with population above 10,00,000 and 25 large cities and more than 200 towns with extensive peri-urban areas. Peri-urban agriculture and horticulture plays a very prominent role in food security of the NCR. Peri-urban areas supply fresh fruits, vegetables, milk, fish, eggs and meat to Delhi and all other urban areas in the NCR. Every day, the NCT of Delhi having about 30 percent of the NCR population consumes 1,300 tons of potato, 860 tons of onion, 682 tons of tomato and about 170 tons of meat. These quantities may at least double for the region as a whole and that would lead to overall, bulk consumption of 5,800 tons every day. Food security is critical to the NCR.
3. In the NCR, about 5.9 lakh hectare area is under sugarcane cultivation with an average yield of 34,134 kg per hectare. The NCR currently has around 25-30 sugar mills, which are mostly located in the UP Sub-region, followed by the Haryana sub-region. During 2018-19 total cane crushing in the UP Sub-region was about 1,399.64 lakh quintals, which has resulted in total sugar production of about 157.76 lakh quintals. While sugar industry provides employment, and enhances farm incomes. sugarcane crop is water intensive.
4. The NCR is the source of multiple farm activities. Out of the total agricultural area of the NCR, about 10-12 percent is used for horticulture or organic farming. Area under wheat is the largest followed by rice, bajra, jowar, maize and barley in the NCR (Table D-9.1.2). The NCR is also an industrialized region. The region cannot exist without linkage with agriculture. However, major fruits like banana, mango, citrus, apple and guava, etc. available in the NCR, come from other parts of the country. The NCR has a strong domestic demand due to changing lifestyles and rising disposable incomes. Its supply side advantages include high level of agricultural production, large livestock base, and a wide variety of crops grown in the region.

Table D-9.1.2: Area under Major Food Grains in the NCR, 2017

Sl. No.	Sub Region	Rice	Wheat	Barley	Bajra	Maize	Jowar
		Area in hectare	Area in hectare	Area in hectare	Area in hectare	Area in hectare	Area in hectare
1	Delhi	5,973	19,622	68	1,487	34	3,193
2	Uttar Pradesh	219,436	577,630	6,606	14,460	40,265	4,705
3	Haryana	670,800	1,372,100	12,600	412,100	2,896	51,099
4	Rajasthan	2,139	363,336	12,807	345,679	5,204	71,555
NCR		898,348	2,332,688	32,081	773,726	48,399	130,552

Source: Delhi Statistical Handbook, 2017; Statistical Abstract of Haryana 2017-18; Statistical Diary and District Statistical booklets, of UP, 2017 and Statistical Abstract of Rajasthan 2015.



Annexure-D-9.2

BRIEF ON RURBAN CLUSTERS IN THE NCR

There are 12 Rurban clusters in the NCR out of which 7 are located in Haryana, 3 in Uttar Pradesh, and 2 in Rajasthan, as on year 2019. These clusters are being developed across the NCR by the respective states under Rurban Mission with a total approved investment of Rs.1,526 crore. Based on local needs, the sectors getting maximum investment in these clusters are water supply, village streets, agriculture services, waste management, skill development, etc. A brief analysis about the Rurban clusters in the NCR is given in (Table D-9.2.1) below:

Table D-9.2.1: Rurban Cluster in the NCR, 2019

S. No.	Sub-Regions	Districts	Clusters	Activities
1.	Haryana	Karnal	Balla	Economic theme is agri-services and processing. Rurban investments are being made in Agriculture Equipment Banks and for providing training to unemployed youth.
2.		Jind	Uchana Khurd	Economic theme is skill development. Rurban investments are being made in Providing training to unemployed youth and Agriculture Equipment Banks.
3.		Rewari	Kosli	Economic theme is skill development. Rurban investments are being made in skill development and dairy farming.
4.		Jhajjar	Badli	Economic theme is skill development. Rurban investments are being made in providing training to unemployed youth.
5.		Panipat	Sewah	Economic theme is agri-services & processing. Rurban investments are being made in setting up agri-service centres & cold storage places.
6.		Faridabad	Tigaon	Economic theme is skill development. Rurban investments are being made in residential training to unemployed youth and in street vending projects.
7.		Mewat	Singar	Economic theme is skill development. Rurban investments are being made in the establishment of multi-skill development training centres and Agriculture Equipment Banks.
8.	Uttar Pradesh	Baghpat	Silana	Economic theme is agri-services and processing. Rurban investments are being made in seed godowns and dairy development.
9.		GB Nagar	Chitehera	Economic theme is agri-services and processing. Rurban investments are being made in organic farming and farmers training programmes.
10.		Ghaziabad	Dasna Dehat	Economic theme is agri-services and processing. Rurban investments are being made in capacity building and skill training for self-employment, and also in farmers' training programmes.
11.	Rajasthan	Alwar	Nauhawan	Economic theme is agri- services and processing. Rurban investments are being made in the construction of animal sheds, and in the irrigation projects.
12.		Bharatpur	Jurahara	Economic theme is skill development. Rurban investments are being made in SHG formation and capacity building, and veterinary building upgradation.

Source: Rurban Mission Portal and Stakeholders' Workshop by Ministry of Rural Development (2019).



10. FUTURE READY CITIZEN INFRASTRUCTURE

10.1 SAFETY, SECURITY & DISASTER MANAGEMENT

1. NCR HAZARDS -EXISTING STATUS

1.1 Crime: As per IPC crime data for NCR in 2018, the total number of cognisable IPC Crimes in NCR was 4,02,509, wherein NCT Delhi accounted for the lion's share of 2,49,012 crimes i.e. nearly 62% of the total crimes. Haryana sub-region accounted for 77,342 IPC crimes i.e. 19% followed by UP sub-region which accounted for 54,795 crimes i.e. nearly 14% and Rajasthan sub-region accounted for 21,360 i.e. 5%. Nearly 50% of major crimes in NCR included Vehicle Thefts (72,027), followed by Crime Against women and Children (46,475) i.e. 32%, and the rest being accounted for by Kidnapping & Abduction (13,048), Arms Act (11,500) and crimes under NDPS Act (3,333).

1.2 Earthquakes: The Seismic Hazard Zoning Map of India of the Vulnerability Atlas of India also indicates that NCR lies in:

- i) High damage risk zone-IV (expected MSK intensity VIII) with regard to earthquake (BIS IS 1893, Part 1:2002);
- ii) Very high damage risk zone B (with regional basic speed (V_b) = 50m/s) with regards to wind and cyclone hazard and
- iii) Areas liable to floods

1.3 Floods: As per the past history of the floods in the Ganga and Yamuna sub-basins, the districts affected are Meerut, Ghaziabad & Bulandshahr in U.P. and Rohtak, Panipat & Sonapat in Haryana. Flood levels in Yamuna cross the danger level almost every year and people living in low lying areas behind the 'bunds' (embankments) are forced to evacuate to the top of the bunds or on road sides at higher elevations. For flood management, Central Water Commission (CWC) is entrusted with monitoring of flood situation and issuing flood forecasts. Flood Forecasting Network covers 325 stations including 197 low lying area/ cities and towns besides 128 reservoirs all over the country. The network also covers NCR areas of NCT of Delhi, Haryana, UP and Rajasthan.

1.4 Fire:

1.4.1 Fire hazards in NCR can be attributed to following main reasons:

- a) Non-implementation of fire safety norms as part of building bye-laws.
- b) Encroachment, overcrowded and haphazard growth affect the movement and timely approachability of fire tenders in emergency.
- c) Inadequate safety measures in the electrical installation and sub-standard wiring and over loading of electrical system.
- d) JJ clusters constructed with highly flammable material and some constructed with very toxic materials like plastics, polyethylene sheets, bamboo, soft wood etc. without proper access for fire tenders.
- e) Storage of flammable/explosive material in the vicinity of populated area and hazardous commercial activities;
- f) Inadequate pumping facilities hamper firefighting and control of fire.
- g) Inadequate availability of special firefighting equipment with local bodies especially for high rise multi storied buildings, where it is a prerequisite.

1.1.2 With respect to fire, as a disaster, there are standards mentioned in the National Building Code but implementing the recommendations in industrialization and urbanization process as well as in unorganized



sector is yet to be done in totality. According to 13th Finance Commission Report (2010-15) there is a deficiency of 98% Fire Stations, 80% Fire Fighting & Rescue Vehicles and 96% fire personnel.¹

- 1.1.3** In NCR, there are about 145 Fire Stations with an average population of 4,09,103 per fire station. In NCR, the average population is 4.1 lakh per fire station. That is quiet high in this region. Sub Region Wise information of population served by each fire station in NCR shows that Delhi has more fire stations and average population per fire station is relatively low as compared to the other Sub-Regions i.e. 2.75 lakhs per Fire station, followed by Haryana Sub Region with 3 lakhs population per fire station and Rajasthan Sub Region with 4.4 lakh population per fire station. In UP Sub Region, the average population per fire station is 6 lakhs per fire station i.e. very high. (Refer Fig. 1 the Sub Region wise average Population per Fire station). The average population per fire station is high in NCR, which implies high response time to fire incidences and increase of resultant loss due to fire.

1.5 Chemical, Biological, Radiological, and Nuclear (CBRN) Hazard

- I) The CBRN scenario gains importance because in recent past, a number of examples of CBRN incidents in India and worldwide have resulted in severe adverse implications. Nuclear (Bulandshar, U.P., 1993) and Radiological (Cobalt-60 in Mayapuri, New Delhi 2010) incidences have taken a heavy toll on human life and economy in urban settings. The incidents in Nuclear Facilities in NCR are given in **Table D-10.1.4.4 of Annexure-D-10.1.4.**
- II) CBRN hazards may arise in a number of ways, such as-explosion in a plant, accidents in storage facilities of chemicals, misuse of chemicals, improper waste management, technological system failures and human error.
- III) For the purpose of specialised response to a threatening disaster situation or disasters/emergencies both natural and man-made such as those of CBRN origin, the Disaster Management Act, 2005 has mandated the constitution of a National Disaster Response Force (NDRF) comprising of eight battalions located at strategic locations and deployed proactively as required. Presently four out of eight of them have been equipped and trained to respond to situations arising out of CBRN emergencies. One such battalion is located in Greater Noida in NCR which cover States of U.P., Uttarakhand, Haryana, Delhi, Chandigarh, Punjab, J&K and Himachal Pradesh while Rajasthan state is covered by NDRF Battalion located in Gandhi Nagar (Gujarat).

2. RISK MANAGEMENT

- IV) Emergency Operation Centers have been set up in only 60% of the total districts in NCR; Centers have been set up in Delhi and Rajasthan Sub-Region, whereas 75% districts in UP Sub-Region have set up Emergency Centres followed by Haryana that has Centres in only 35% of the districts. It is observed that Disaster Management provisions are yet to be incorporated in Master/ Development Plans. Delhi has incorporated the provisions whereas other Sub-Regions are way behind in this task

- 2.1** Regarding the capability for disaster risk mitigation, district level authorities have been constituted and the status of Constitution of District Disaster Management Authority and District Disaster Management Plan in NCR are attached at (**Table D-10.1.5.1 in Annexure D-10.1.5**). It shows that barring only a few, most of the districts have constituted District Disaster Management Authority and District Disaster Management Plans have been prepared.

- 2.2** Brazil is such an example where Night crimes reduced when children are involved in various activity like night sports.

¹<https://www.prsindia.org/uploads/media/13financecommissionfullreport.pdf>



Annexure D-10.1.1

DELHI POLICE INITIATIVES

- 1. Emergency Response Support System (ERSS-112) - Vision of MHA, Govt. of India, to provide a single emergency response number '112' across the country:**
 - a) An automated system to handle different distress signals from citizens (voice, panic messages, email, web, 112 SOS App sms etc.), on a central platform
 - b) Provides distributed dispatch facility of Police, Ambulance, Fire etc.
- 2. Objective of ERSS-112 project**
 - a) Establishing state of art ERSS-112 Control Room and infrastructure.
 - b) Integrated handling of all type of calls like Police Assistance, Medical & Fire.
 - c) Further improving response time of PCR Van to the caller location.
 - d) Elimination of manual handling of calls & Proper accounting of events and action.
 - e) Proper manpower & vehicle tracking and management.
 - f) Providing online maintenance to the system and achieving best Minimum Breakdown Recovery (MBR).
 - g) Achieving excellence in smart policing.
- 3. Other projects of Operation & Communication unit**
 - a) Safe City Project being developed in New PHQ building.
 - b) Cyber Highway Project at old PHQ Building
 - c) C4i (Integrated Command Control & Coordinator Center) at old PHQ Building.
 - d) In 2009 Delhi Police having only 07 District but now it has been increased up to 15 District and till 2041 it will be more than 40 DCRs with Anti Drone system because of automation in material delivery.
 - e) High Priority Calls Escalated in C4i, on Terrorist Attack, Explosion, Communal Riots, Murder, Dacoity, Rape, Robbery, Carjacking, Fire Major, Attempt to Murder, Snatching, Kidnapping
 - f) Himmat – a women safety mobile application.



Annexure D-10.1.2

UP POLICE MANAGEMENT SYSTEM

1. UP Emergency Management System was earlier known as UP-100. Now it is 112 our response time is 10.4 minutes. Modern control room is located in Lucknow.
2. UP- 112 project was approved in December, 2015 inaugurated in November, 2016. On 7th january.2017 it was implemented in all 75 Districts of UP.
3. Objective of UP EMS-112. 24x7 assistance to citizens of UP. Anyone may reach 112 and all calls go through PRI lines call process. Communication Officer (CO) greets and voice gets recorded and stored, CO closes non-actionable calls, raise actionable to Despatch Officer (DO) through CAD software. DO will transfer high priority calls to Senior Despatch Officer (SDO). They have 500 SOPs and data recovery centre in Lucknow and Baghpat.
4. Transform police citizen interface where citizens are not required to go to police station. Daily feedback of 9500 calls is recorded. All calls have been recorded. Citizens can upload photographs, videos, documents of crime.
5. UP Police has 3200 PRV cars. They have issued petro cards for each PRV. Digital mapping has been done for village boundaries and jurisdiction of police station.
6. UP police also uses GIS mapping of cities. Also developed ROIP radio over internet protocol. It is also available in Hindi language with CAD implementation.
7. Business intelligence tool is also used. Trend analysis and productivity analysis can be done. They can integrate it with Indian calendar.
8. 108 ambulance services is also integrated with UP-112
9. Citizen can avail services of Fire services through UP-112
10. Citizen emergency app for missing persons. They have case monitoring police app for supervisor and officers & also have intranet dashboard from state to police station level.
11. Integration with GRP. Prayagraj is small city command and control centre, 112 India app is also integrated with UPSRTC buses.
12. UP police has also launched SAVERA for senior citizens.



Annexure D-10.1.3

ZIPNET PROJECT²

ZIPNet (Zonal Integrated Police Network) was introduced in the year 2004 by Delhi Police. The main objective of the Project is to share Crime and Criminal Information in real-time. Project is approved by the MHA, INDIA. The information published on it, relates to Public Interest. Prior to ZIPNET, the information use to circulate through offline modes like Papers, TPM, and Wireless Communication. It provides Search Engines to match information from Central repository in online environment. Initially, it was brought forward with the collaborative efforts of Delhi, Haryana, Uttar Pradesh, and Rajasthan Police. It contains following modules for public/police domain:

1. FIR(Heinous Cases : Murder, Dacoity, Robbery & Snatching)
2. Arrested Persons(Heinous Cases : Murder, Dacoity, Robbery & Snatching)
3. Most Wanted Criminals
4. Proclaimed Offenders
5. Missing Children
6. Children Found
7. Missing Person (including action taken module for authenticated Users Only)
8. Un-identified Dead Bodies
9. Un-identified Person Found(Unconscious, Minor, Abandoned, Mentally Disturbed)
10. Stolen Vehicles
11. Unclaimed/Seized Vehicles
12. Missing/Stolen Mobiles
13. Police Alerts
14. Daily Police Bulletin(Authenticated Users Only)
15. Jail Releases(Authenticated Users Only)
16. Bail Out(Authenticated Users Only)
17. Press Releases(Authenticated Users Only)
18. Messaging(Authenticated Users Only)

²<https://zipnet.delhipolice.gov.in/>



Annexure D-10.1.4

VULNERABILITY AND RISK ASSESSMENT OF NCR**I. Vulnerability and Risk Assessment of the Region Due To Natural Hazards****A. Earthquake**

Six historical earthquakes of magnitude 5.5 to 6.8 are known to have occurred in NCR and its surrounding area since 1720 AD, as detailed in **Table D-10.1.4.1**.

Table D-10.1.4.1: List of Historical Earthquakes of Magnitude 5.5 to 6.8 Occurred in NCR and its Surrounding Area since 1720 AD

Sl. No.	Date	Epicenter		M	Remarks
		°N	°E		
1	15.07.1720	28.37	77.10	6.5	It was described by Oldham (1883) in which walls of the fortress and many houses in Delhi were destroyed. It was followed by 4 to 5 aftershocks per day for 40 days and occasional shocks for 4 to 5 months.
2	01.09.1803	27.50	77.70	6.8	It was recorded, felt in very large area and was responsible for damage to buildings in which 23 persons were killed in Bulandshahar and some were injured in Delhi. Damage to the Qutub Minar in Delhi during this earthquake has also been reported by some researchers.
3	16.01.1842	27.00	78.00	5.5	-
4	10.10.1956	28.15	77.67	6.7	-
5	27.08.1960	28.20	77.40	6.0	It was reported felt at Delhi, Kanpur and Jaipur. Minor property damages and injuries to about 50 persons were reported from Delhi.
6	15.08.1966	28.67	78.93	5.8	-

Source: India Meteorological Department, Ministry of Earth Science

The seismic vulnerability of built environment of NCR need to be examined vis-a-vis high frequency ground motions due to events endemic to faults of Peninsular Domain capable of producing earthquake of magnitude around 6.5 to 6.7 and also due to frequency content of attenuated events with source zone in thrust domain of Himalayas capable of producing earthquake of magnitude around 8.0.

National Capital Region falls in Seismic Zone IV of the Seismic Zoning Map (BIS IS 1893, Part 1:2002) of the country. This makes the area liable to experience MSK intensity of 'VIII' and is considered as High Risk Zone. Such intensity may cause severe damages to the structures of different types. Some of them are listed below:

Box D-10.1.4.1

Manit2ude	Earthquake Effects
2.5 or less	Usually not felt, but can be recorded by seismograph.
2.5 to 5.4	Often felt, but only causes minor damage.
5.5 to 6.0	Slight damage to buildings and other structures.
6.1 to 6.9	May cause a lot of damage in very populated areas.
7.0 to 7.9	Major earthquake. Serious damage.
8.0 or greater	Great earthquake. Can totally destroy communities near the epicenter.

- Type A- Houses constructed with stone, rural structures, un-burnt bricks, clay, etc. may suffer destruction causing gaps in walls, collapse of parts of buildings, loosing of cohesion of part of buildings and collapse of inner walls.
- Type-B- Building constructed with ordinary bricks, large blocks, natural stone and prefabricated type buildings may suffer heavy damage causing large & deep cracks in walls.
- Most buildings of Type-C i.e. RCC buildings may have small cracks in walls, fall of large pieces of plaster, slipping off tiles, cracks/fall in chimneys, etc.
- Fright and panic is caused among people.

The approximate area subjected to damaging intensities MSK, VIII and VII in five earthquakes of magnitude around 6.5 occurred in different part of the country are as given in **Table D-10.1.4.2**.



Table D-10.1.4.2: Damage by Earthquakes of MSK* Intensities VIII & VII of Magnitude 6 to 6.6 occurred in Himalaya and Peninsular region

Earthquake	Magnitude	Approximate Area (I=VIII) in sq. km.	Approximate Area (I=VII) in sq. km.	Total approximate area under intensity VII & VIII in sq. km.
Koyana, 1967	6.5	130	430	560
Uttarkashi, 1991	6.6	700	1300	2000
Killari, (Latur) 1993	6.3	420	930	1350
Jabalpur, 1997	6.0	455	1930	2385
Chamoli, 1999	6.3	75	845	920

Source: India Meteorological Department, Ministry of Earth Science.

* Medvedev-Sponheuer-Karnik (MSK) scale has 12 intensity degrees expressed in Roman numerals starts from I (Not perceptible) to XII (Very catastrophic)

Whole urban development in region must be checked for safety against a probability of occurrence of seismic intensity “VIII” and upgraded for required seismic resistance in buildings & infrastructure as found necessary to withstand minimum Peak Ground Acceleration value of 0.24g.

The Seismic Hazard Microzonation (SHM) provide basic input for further study of Seismic Hazard and Risk Microzonation (SHRM) and is one of the important tools for disaster mitigation planning for urban areas, as it can minimize disaster impacts of an earthquake. Seismic Hazard and Risk Microzonation provides

- Probabilistic estimate of earthquake hazard at each microzone on earthquake shaking,
- Extent of likely damage to built environment (dwellings, community structures, lifelines, industrial structures, monuments and heritage structures) and define damage ratio and people living in structures susceptible to damage,
- Measures for retrofitting of existing structures to render them safe and
- Specific guidelines for designing and construction of earthquake resistant structures in different microzones.

Seismic Hazard microzonation is basically determination of frequency dependent transfer function due to impedance contrast between bedrock and overlying soil at the site and will provide site specific parameters for design of buildings. This would be helpful for identifying areas of low and high hazard zone, suitable area for different types of constructions i.e. Low and high rise, etc. Thus this study will be helpful for micro level planning of urban agglomeration. **Floods**

Box D-10.1.4.2

Zone	MSK IX or more	Very High Damage Risk Zone All surface and underground structures completely destroyed.
Zone IV	MSK VIII	High Damage Risk Zone Waves may be seen on very soft ground. Older structures partially collapse or sustain considerable damage
Zone III	MSK VII	Serious damage to older buildings, masonry chimneys collapse. Small landslides.
Zone II	MSK VI or less	Low Damage Risk Zone Visible damage to masonry structures, cracks in plaster. Isolated cracks on the ground.

The main causes of floods are heavy rainfall, inadequate capacity of rivers to carry the high flood discharge, inadequate drainage to carry away the rainwater quickly to streams/rivers, flash floods occur due to high rate of water flow as also due to poor permeability of the soil. Vulnerability to floods is caused by the high population density, widespread poverty, unemployment, illiteracy and enormous pressure on land. One of the reasons for damage of property and life by floods is development of slums/ unauthorized construction in High Flood Level area. Flood results in the outbreak of serious epidemics specially, malaria and cholera, simultaneously, scarcity of water. To manage these serious issues, NDMA has prepared guidelines on Management of Floods wherein measures for preparedness, prevention, mitigation in the pre-flood stage and on prompt and effective response, relief and recovery during and post flood stages have been focused. Importance on non-structural measures besides



structural measures is emphasized in the guidelines. Setting of basin-wise organizations for flood management and also for setting up a National Flood Management Institute for training, education and research are suggested in the guideline.

As per the Flood Atlas of India prepared by Central Water Commission, only small portion towards the south-east in Delhi is unprotected flood prone area (about 1.7% or 25 sq.km.) and considerable area (about 5% or 74 sq.km.) in the north-eastern parts which is protected by earthen embankments. Flood levels in Yamuna cross the danger level almost every year and people living in low lying areas behind the 'bunds' (embankments) are forced to evacuate to the top of the bunds or on road sides at higher elevations. The flow and the expected flood levels of the river Yamuna at Delhi is forecast by the Central Water Commission through hydrological and hydraulic observations on the upstream, particularly taken at Hathnikund headworks about 130 km upstream from where two canals take off from the Yamuna, one on its left bank Western Yamuna Canal (WYC) and the other on the right bank Eastern Yamuna Canal (EYC). Since the Hathnikund Barrage/headworks and the two canals have limited capacity, in the event of heavy precipitation in the catchment area of Yamuna and its tributaries, the river downstream comes in spate, overflowing its banks and flooding the adjoining low lying areas. Also great damage is caused to areas deep inside the region because of the back flow in the drains which is otherwise meant to discharge excess water into the river. In addition, heavy precipitation within the region causes local flooding of streets and localities on a large scale. In recent years even moderate rainfall has resulted in local floods. Main reason for these local floods is high rate of runoff from urban areas which have been continuously growing at a very rapid rate. This problem of local floods is expected to aggravate in NCR because, almost the entire area is likely to get urbanized leaving very little scope for open and soft landscape surfaces, which help in absorbing runoffs and soften the impact of floods.

B. High Winds

The macro-level wind speed zones of India have been formulated and published in IS:875 (parts) - 1987 titled "Indian Standard Code of Practice for Design Loads (other than earthquakes) for Building and Structures, Part 3, Wind Loads". As regards to wind hazard, design wind speed in the entire region is 47 m/s (169 km/h) as per IS:875 (Part 3), which could be reached only occasionally in what is called 'Andhi' (wind storm). However, the NCR area falls in Very high damage risk zone B ($V_b = 50\text{m/s}$). The structures in this region should be designed keeping in view the above wind speed. In such events, weak houses of thatch, sheets etc. and those with sloping roofs using thatch, tiles, AC sheets and Corrugated Galvanized Iron (CGI) sheet roofs, which are not fully anchored and integrated, will suffer damage.

During the summer season, extreme positive departures from the normal maximum temperature result in a heat wave. The flow of hot waves is also known as 'loo'. Generally heat waves develop in the north-western parts of India and from this area they progress to neighbouring states. **Table D-10.1.4.3** gives the number of heat waves observed in the NCR participating States during 1911-2009:

Box D-10.1.4.3

Six basic wind speeds 'VO' considered for zoning, namely 55, 50, 47, 44, 39 and 33 m/s as follows:

55 m/s (198 km/h)	Very High Damage Risk Zone A
50 m/s (180 km/h)	Very High Damage Risk Zone B
47 m/s (169.2 km/h)	High Damage Risk Zone
44 m/s (158.4 km/h)	Moderate Damage Risk Zone -A
39 m/s (140.4 km/h)	Moderate Damage Risk Zone - B
33 m/s (118.8 km/h)	Low Damage Risk Zone

Box D-10.1.4.4

Wind Speed, sec	Typical Possible Movement
30-35	Roof sheets fixed to battens fly
35-40	Small aircrafts take off speed
40-45	Roof tiles nailed to battens fly
45-50	Garden walls blow over
50-55	Unreinforced brick walls fail
55-60	Major damage from flying debris
60-65	75 mm thick concrete slabs fly

Source: Report on Guidelines for cyclone resistant construction of Buildings in Gujarat prepared by Gujarat State Disaster Management Authority, Govt. of Gujarat



Table: D-10.1.4.3 Heat waves occurred during 1911-2009 in NCR

Sl. No.	State	Epochs (events)			
		1911-67	1968-77	1978-99	2000-2009
1.	Delhi,	-	1	4 (*49)	17
2.	Haryana			12 (*37)	
3.	Uttar Pradesh	105	6	23 (*686)	-
4.	Rajasthan	27	3	42 (*1625)	14

Source: IMD Disastrous weather Events Annual Report; EMDAT

* Number of heat waves followed by the total no. of deaths within bracket.

The **Table D-10.1.4.3** indicates that the Rajasthan and Uttar Pradesh are more affected by heat waves. Prolonged severe heat wave condition may cause serious problems to water supply, moisture stress in the soil and adversely affect agriculture. When an area is affected by severe heat wave and also followed by delayed onset of monsoon, then the situation becomes more miserable for the inhabitants because of water scarcity and delay in sowing operations. The casualties due to heat waves were found maximum in Rajasthan followed by Uttar Pradesh, Haryana and Delhi. It may also be noted that loss of human lives in a region due to heat waves is not only depend on the number of waves spells but also on the socio-economic condition of the people.

This wind scenario does not cover the risk of tornado, which is a seldom case in respect of its occurrence, intensity and path, and is extremely difficult to deal with in general hazard risk studies. Also, in any one wind storm, it is unlikely that the whole or a large part of Delhi will be affected at once, and neither is there any possibility of a disastrous consequence from this hazard.

II. Vulnerability and Risk Assessment of the Region Due to Man Made Hazards

Rapid urbanization and industrialization are forced to adopt new approaches for Socio-economic development. Increased population density and mixed occupancy, construction of high rise buildings having multi activities, roads, industries are the major development activities which causes Man made hazards like fire, Chemical, Biological, Radiological, and Nuclear(CBRN) hazards, road accidents, etc.

A. Fire Hazard

Fire hazards in NCR can be attributed to following main reasons:

- Non-implementation of fire safety norms as part of building bye-laws.
- Encroachment, overcrowded and haphazard growth affect movement and timely approachability of fire tenders in emergency.
- Inadequate safety measures in the electrical installation
- Sub-standard wiring and over loading of electrical system.
- JJ clusters constructed with highly flammable material and some constructed with very toxic materials like plastics, polyethylene sheets, bamboo, soft wood etc. without proper access for fire tenders.
- Storage of flammable/explosive material in the vicinity of populated area and hazardous commercial activities;
- Inadequate pumping facilities hamper fire fighting and control of fire.
- Inadequate availability of special fire fighting equipments with local bodies especially for high rise multistoried buildings, where it is a prerequisite.

A comprehensive study of the vulnerability due to fire hazards in the region and in different areas of fast-growing towns should be taken up and adequate safety provisions be made for future planning of NCR and improvement in the quality of electrical cabling, wiring and distribution systems should be made.



B. Chemical, Biological, Radiological, and Nuclear (CBRN) Hazard

The incidents in Nuclear Facilities in NCR are given in **Table D-10.1.4.4:**

Table: D-10.1.4.4 Incidents in Nuclear Facilities in NCR

Date & Month	Place	Event
31 Mar 1993	Bulandshahr, Uttar Pradesh,	A fire occurred in Turbine building which is not a part of reactor system. This resulted in damage of the steam turbine blades. The reactor was brought to safe shutdown state. The unit was restarted after Regulatory approval.
April, 2010	Mayapuri, Delhi	In a radiological accident, an irradiator was sold to metal scrap dealer. The dealer dismantled the irradiator which caused release of radioactive source resulting the exposure to a worker in the shop lead to one fatality.

Source: Report on Disaster Management in India, prepared by Ministry of Home Affairs



Annexure D-10.1.5

Table D-10.1.5.1: Status of Constitution of District Disaster Management Authority, District Disaster Management Plan, Emergency Operation Centre and Emergency Response Centre in NCR

Sl. No.	Sub Region	District	Status of District Disaster Management Authority (DDMA)	Status of District Disaster Management Plan (DDMP)	Emergency Operation Centre (EOC)	Emergency Response Centre (ERC)	Single Number Dialing facility for Emergency (e.g. UP 100)
			(Constituted/ Not Constituted)	(Prepared/ not Prepared)	(Established/ not established)	(Established/ not established)	
1	Delhi	Delhi	Constituted	Prepared	Established	Established	1077
2	Haryana	Bhiwani	Constituted	Prepared	Not Established	Not Established	Yes
3		Charkhi Dadri	Constituted	Prepared	Not Established	Not Established	No
4		Faridabad					
5		Gurugram	Not Constituted	Prepared	Not Established	Established	Yes
6		Jhajjar	Constituted	Prepared	NA	Established	Yes
7		Jind	Constituted	Prepared	Established	Established	No
8		Karnal	Constituted	In Progress	Established	Established	Yes
9		Mahendragarh	Constituted	Prepared	Established	Established	
10		Mewat	Constituted	Prepared	Not Established	Not Established	
11		Palwal	Constituted	Prepared	Established	Established	Yes
12		Panipat					
13		Rewari	Constituted	Not Prepared	Not Established	Not Established	Yes
14		Rohtak	Constituted	Prepared	Established	Established	No
15		Sonipat	Constituted	Prepared	Not Established	Not Established	No
16	Uttar Pradesh	Baghpat	Constituted	Prepared	Established	Established	No
17		Bulandshahr	Constituted	Prepared	Established	Established	100
18		Gautam Budh Nagar	Constituted	Prepared	Established	Established	No
19		Ghaziabad	Constituted	Prepared			
20		Hapur	Constituted	Prepared	Established	Established	100, 9454418758 101, 9854418759, 9454418383, 0122-2312100
21		Meerut	Constituted	Prepared	Not Established	Not Established	1077
22		Muzaffarnagar	Constituted	Prepared	Established	Established	101 and 100
23		Shamli	Constituted	Prepared	Established	Established	1077
24	Rajasthan	Alwar	Constituted	Prepared	Established		
25		Bharatpur	Constituted	Prepared	Established	Established	107705644-220320

Source: NCR Planning and Monitoring Cell, UP, Haryana, Rajasthan, website of the Disaster Management, Relief & Civil Defence Department, Govt. of Rajasthan.



Table D-10.1.5.2: Status of Incorporation of Disaster Management provisions in Master/Development Plans and Building Bye-Laws

Sl. No.	Sub Region	District	Status of Incorporation of Disaster Management provisions in Master/ Development Plans	Status of Incorporation of Disaster Management provisions in Building Bye-Laws
1	Delhi	Delhi	Yes	Yes
2	Haryana	Bhiwani		
3		Charkhi Dadri	Yes	Yes
4		Faridabad		
5		Gurugram		
6		Jhajjar	No	No
7		Jind	Yes	The building constructed by PWD (B&R) are based on approved drawing prepared by O/o Chief Architect Chandigarh and the drawing are prepared keeping in consideration all the disaster management provisions such as fire escape provision etc and building bye laws are adhered to.
8		Karnal	The various provisions relating to disaster management have been incorporated in the DDMP (2018-19) by way of making necessary tie up with all the line /concerned agencies /NGO's and their representatives at various level as and when needed in the preparation of DDMP.	Are provided as per Building bye Laws.
9		Mahendragarh	Not Applicable	Not Applicable
10		Mewat	Not to be done by the department of town & country planning	To be done by the concerned department like HSVP corporation etc.
11		Palwal	Instructions are being issued while approving the building plan	Already incorporated in Haryana Building code-2017
12		Panipat		
13		Rewari		
14		Rohtak	Incorporated in Building Code 2017	Incorporated in Building Code 2017-18
15		Sonipat		
16	Uttar Pradesh	Baghpat	No	Provisions of Earthquake Resistant buildings are there in Building Bye Laws 2008
17		Bulandshahr	No	Provisions of Earthquake resistant Building are there in Building Bye Laws-2008
18		Gautam Budh Nagar		
19		Ghaziabad	Incorporated	Incorporated
20		Hapur		Provisions of Earthquake Resistant Building are there in Building By laws 2008
21		Meerut	Yes, incorporated in Building by laws	Provision made in building bye laws 2008 (As Amended 2011&2016) and Amendment 2017
22		Muzaffarnagar		Structural safety natural hazard protection of buildings provisions in building bye-laws 2008, 2016, 2017 are effective.
23		Shamli	Master plan is not applicable	Structural safety natural hazard protection of buildings provisions in building bye-laws 2008, 2011, 2016, 2017 are effective.
24	Rajasthan	Alwar		
25		Bharatpur		

Source: NCR Planning and Monitoring Cell, UP, Haryana, Delhi Master Plan.



Table D-10.1.5.3: Sub Region Wise population served by each fire station in NCR (Census 2011)

Sl. No.	Sub Region	No. of major fire stations	Population	Population per fire station
1	Delhi	61	16787941	275212
2	Haryana*	39	12202331	312880
3	Uttar Pradesh	31	18719180	603845
4	Rajasthan	14	6222641	444474
	Total	145	53932093	409103

* Excluding Gurugram, Karnal, Panipat districts

Source: Census of India 2011, DFS, GNCTD; NCR Planning and Monitoring Cell UP, Haryana, Govt. of Rajasthan



Annexure D-10.2

SUB-REGION WISE STATUS OF HEALTH INFRASTRUCTURE**General**

- i) There are about 19 trauma centers in NCR (NCT Delhi-08, Haryana subregion-03, U.P. sub region-05 & Rajasthan sub region-03) with bed capacity of about 426, nursing staff of about 128 and 62 doctors catering to the need of trauma patients. Sub-region wise Status of Health infrastructure in NCR along with assessment of Blood bank and trauma centers in NCR.
- ii) The Government agencies have to ensure the enforcement of quality healthcare standards for a diverse cross-section of healthcare providers like public sector healthcare services, private, co-operative and other non-profit organizations.
- iii) Most developed countries have a widespread insurance network in the healthcare sector. In India, the insurance industry is now picking up. The percentage of the Indian population having health insurance policies is very low, and there are very few companies offering insurance in the healthcare sector, especially for the lower-middle and middle-middle classes. Nonetheless, it is expected that insurance will play a major role in the Indian healthcare system in the near future.
- iv) India, the land of Ayurveda, has a wide variety of special treatments to offer. In addition, there are hospitals practicing modern medicine that provide quality service at an affordable cost. When compared to the expense of medical treatment in Western countries, India's facilities for treatment, natural beauty and tourist destinations across the country make it a popular 'Health Tourism' destination for healthcare seekers.
- v) In the year 2006, the Quality Council of India, through the National Accreditation Board for Hospitals (NABH) had come out with hospital standards that are applicable to Indian hospitals. The likelihood of an insurance boom in the healthcare sector and the potential for health tourism are important reasons for accrediting the hospitals. Therefore, accreditation and quality health service along with Telemedicine/E-medical records etc. will be the main agenda of hospitals in the years to come.

1. Hospitals

National Capital Region has 101 district hospitals, 214 Community Health Centers and 582 Public health centers and 97 ESI Hospitals and dispensaries under its jurisdiction. In Haryana sub region, districts like Palwal, Mewat and Sonapat have only one district level hospital whereas others districts like Gurugram, Faridabad and Jind has more than 3 district hospitals catering to the need of people in the region. Similarly. in UP sub region and NCT Delhi, Baghpat district and North East and South East districts have lesser number of district hospitals than district like Bulandshahr, Ghaziabad and Central or North West Delhi.

In terms of Community Health Centers (CHCs) and Public Health Centers (PHCs), UP sub region has 72 CHCs and Haryana sub region has 301 PHCs and 57 ESI Hospitals and dispensaries. Concentration of CHCs and PHCS are more in the rural districts of the sub regions such as Bhiwani district has 29 PHCs and 6 CHCs, Mahendragarh has 25 PHCs and 5 CHCs in Haryana sub region, Baghpat has 20 PHCs and 7 CHCs and Muzaffarnagar 43 PHCs and 9 CHCs in UP sub region. Most of the ESI hospitals and dispensaries are located in the urban districts of the NCR, like Faridabad (25), Gurugram (7) in Haryana sub region, Ghaziabad (14) in UP sub region and in Alwar (6) district of the Rajasthan sub region.



Table D-10.2.1: Existing Government Health Facilities in NCR, 2019

Sub Regions	Districts	No. of District Hospitals	No. of CHCs	No. of PHCs	No. of ESI Hospitals & Dispensaries	No. of Other Hospitals
NCT Delhi	9	44	25	7	4	9
Haryana	14	41	63	301	57	0
Uttar Pradesh	8	14	72	80	28	11
Rajasthan	2	2	54	194	8	2
NCR	33	101	214	582	97	22

Source: NCR Monitoring and Planning Cell, Govt of NCT Delhi, Govt. of Haryana, Govt of UP and Govt of Rajasthan, *<https://www.esic.nic.in/Haryana> and <https://www.esic.nic.in/dispensaries-uttar-pradesh> and <https://www.esic.nic.in/dispensaries-rajasthan>

Table D-10.2.2: Existing private & charitable health facilities in NCR, 2019

Sub Regions	Districts	Multi-Specialty Hospital	General Hospitals	Nursing Home	Charitable Hospital	Other Hospitals	Total No.
NCT Delhi	9	1175*					1175
Haryana	14	74	2	44	17	5	142
Uttar Pradesh	8	140	294	189	7	96	726
Rajasthan	2	1	27	5	1		34
NCR	33	215	323	238	25	101	2077

Source: NCR Monitoring and Planning Cell, Govt of NCT Delhi, Govt. of Haryana, Govt of UP and Govt of Rajasthan and * ECONOMIC SURVEY OF DELHI, 2019-20

There are over 2000 private and charitable health facilities including multi-specialty hospitals, general hospitals, nursing home etc. in the National Capital Region. NCT Delhi has 1175 private and charitable hospitals followed by UP sub-region with 726 health facilities, 142 in Haryana sub region and 34 in Rajasthan sub region. Concentration of General Hospitals can be seen in the NCR with 323 hospitals followed by 238 nursing homes and least number of charitable hospitals.

2. Blood Banks

NCR has about 177 blood banks both government owned (50) and private sector operated (127) in the region. Larger concentration of blood bank facilities is available in Uttar Pradesh Sub region with about 59 privately operated blood bank facilities and followed by 33 each at NCT Delhi and Haryana sub region. NCT Delhi has higher number of government owned and operated blood bank facilities in the NCR. Faridabad, Gurugram, Ghaziabad and G B Nagar and Meerut districts has the maximum number of blood banks in Haryana and UP sub region, whereas, other districts of the sub region and region has comparatively less number of blood bank facilities.

Table D-10.2.3: Blood Bank Facility in NCR, 2019

Sub Regions	Total	Private	Government
1	2 (3+4)	3	4
NCT Delhi	55	33	22
Haryana	48	33	15
Uttar Pradesh	68	59	9
Rajasthan	6	2	4
NCR	177	127	50

Source: For Haryana - <http://haryanahealth.nic.in/BloodBank.html> as on 21.01.2020

For UP - https://sbtcup.org/all_blood_banks.php accessed on 01.07.2020

For Rajasthan - http://nbtc.naco.gov.in/assets/resources/reports/commonResource_1517228831.pdf



3. Trauma Centers

There are 19 trauma centers in the National Capital Region with the bed capacity of 426, 128 nursing staff and 62 doctor staff catering to the urgent need of trauma patients. Haryana state has a total of 7 trauma centers of which 3 are in Haryana sub region of the NCR and the state government has proposed to build 12 more trauma centers³ across the state to save more lives and for better coverage.

According to Trauma Care Guidelines 2018-25 of Govt of UP, tertiary level trauma care services in the State are mainly limited to 21 Government and 29 Private Medical Collages in the state. However, the state has 43 approved trauma care facilities, the State Government funds 37, and six receive funding from the Central Government (out of 43, construction of 30 trauma care facilities has been completed) 5 trauma centers falls within the jurisdiction of UP Sub region of the NCR. In NCT Delhi, 8 trauma centers are functional and working to save lives in the city. In Rajasthan Sub region, the state government is operating 3 Trauma Centers, 2 at Alwar and 1 at Bharatpur district. These trauma centers are equipped to provide emergency and accident care related services to the patients with dedicated team of experts like nurses, doctors and others.

Table D-10.2.4: Trauma Centers in the NCR, 2019

Sub Regions	No. of Trauma Centers	Bed Capacity	Doctor Staff	Nursing Staff
NCT Delhi	8	-	-	-
Haryana	3	252	38	85
Uttar Pradesh	5	124	24	43
Rajasthan	3	50	0	0
NCR	19	426	62	128

Source: ^{*}<https://www.credihealth.com/hospitals/delhi-ncr/emergency-and-trauma> and NCR Monitoring and Planning Cell, Govt of Haryana, UP and Rajasthan

Table D-10.2.5: Trauma Centers in the NCR area with the facilities available, 2019

Sub Regions	Districts	No. of Trauma Centers	Bed Capacity	Doctors Staff	Nursing Staff	Facilities available
NCT Delhi	Total	8				
Haryana	Karnal	1	18	38	85	Accident and Emergency (A&E) Care Unit Dedicated post-crash trauma team Ambulance Facility etc.
	Panipat	1	204			
	Rewari	1	30			
	Total	3	252			
Uttar Pradesh	Bulandshahr	1	10	24	43	Accident and Emergency (A&E) Care Unit Dedicated post-crash trauma team Trauma Team (Specialist/ Nurses/ EMT) Facilities for adequate diagnosis Rehabilitation unit ((Physiotherapist, Vocational therapist, speech therapist, and counsellors)) Ambulance Facility
	Ghaziabad	1	14			
	Hapur [^]	1	70			
	Meerut [^]	1	20			
	Muzaffarnagar	1	10			
	Total	5	124			
Rajasthan	Alwar	2	-	0	0	Accident and Emergency (A&E) Care Unit Dedicated post-crash trauma team Ambulance Facility etc.
	Bharatpur	1	50			
	Total	3	50			
NCR	G Total	19	426	426	426	

Source: <https://www.credihealth.com/hospitals/delhi-ncr/emergency-and-trauma> and NCR Monitoring and Planning Cell, Govt of Haryana and for Rajasthan ([http://nrhmrajasthan.nic.in/List%20of%20Trauma%20Center%20\(GOI\)_List%20of%20Trauma%20Center%20\(GOR\).pdf](http://nrhmrajasthan.nic.in/List%20of%20Trauma%20Center%20(GOI)_List%20of%20Trauma%20Center%20(GOR).pdf)) and <http://www.uphssp.org.in/Tenders/Traumacareguidelines.pdf> for UP

Note: [^] under construction (approved by state govt.)

³<https://economictimes.indiatimes.com/news/politics-and-nation/trauma-centres-on-haryana-highways-after-every-60-km-cm-manohar-lal-khattar/articleshow/58053779.cms>



4. Ambulance Facilities

National Capital Region has 1395 ambulance facilities in both urban and rural government as well as private hospitals. Haryana sub region has 634 ambulance facilities followed by Haryana sub region with 426 ambulances. Government hospitals located in the urban areas have better access to ambulance facilities in comparison to private hospitals in rural areas.

Table D-10.2.6: Ambulance facilities in the urban and rural areas of NCR, 2019

Sub Regions	Total	Government Hospitals		Private Hospitals	
		Urban	Rural	Urban	Rural
1	2 (3+4+5+6)	3	4	5	6
NCT Delhi	261	-	-	-	-
Haryana	426	242	88	84	12
Uttar Pradesh	634	201	325	56	52
Rajasthan	74	60	14	0	0
NCR	1395	503	427	140	64

Source: NCR Monitoring and Planning Cell, Govt of NCT Delhi, Govt. of Haryana, Govt of UP and Govt of Rajasthan

Box. D-10.2.1: Snapshot of SDG Goals on Health

The 2030 Agenda for Sustainable Development Goal (SDG-3) of the of the United Nation's, adopted by all UN Member States in 2015 to ensure healthy lives and promote wellbeing for all at all ages by achieving Universal Health Coverage, including financial risk protection, access to quality essential health care services, medicines and vaccine for all; Interaction with economics, other social and environmental SDGs and SDG-17 on means of implementation. Maternal Mortality Ratio, Neonatal Mortality rate, Infant Mortality Rate, Under 5 Mortality Rate and Total Fertility Rate are the Key Health Indicators in India. The SDG targets to halve the number of global deaths and injuries from road traffic accidents by 2020 and to reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being by 2030.

The Universal Health Coverage (UHC) vision in India proposes that every citizen be entitled to essential healthcare services. Besides being inclusive, all the services are slated to be delivered at affordable costs, so that people do not suffer financial hardships in the pursuit of good health. The Government is mandated to act as not only the provider of health and related services, but also the guarantor and enabler.

Box. D-10.2.2: Extract from Stakeholders Workshop on Health

Rajasthan sub-region, there 68 PHCs and 5 UHCs under urban health mission in Bharatpur. One medical college and 03 trauma centres in Bayana ,Deeg exist. It is well equipped but not yet functional. Under Ayushman Bharat, 68 PHCs has been converted into Health and Wellness Centres and 18 health sub centres are also converted into Health and wellness centres. Actions have been initiated regarding Training of professionals.

UP Sub-region, has 14 district hospitals (exc. Shamli and Hapur), 72 CHCs facilities, 80 PHCs Facilities, 4 ESI Hospitals/Dispensaries and 11 other hospitals.

- Highest concentration of district level hospitals can be found in Bulandshahr (4) district followed by Meerut (3) and others, bed capacity is as high as 526 beds in Meerut, 404 in Bulandshahr, 366 in Ghaziabad and so on.
- In Community Health Centers (CHC) facilities, maximum CHCs are in Meerut and Shamli (14) district followed by Muzaffarnagar district (9) with bed capacity of 480, 380 and 270 respectively.
- 43 PHCs are located in Muzaffarnagar district with 172 beds followed by Bulandshahr and Baghpat district with 13 and 20 PHCS and 390 and 108 beds.



- There are 1 each ESI hospitals are preset in the G B Nagar and Ghaziabad district and 2 ESI hospitals in Hapur districts.
- There are 8 other hospitals in the Hapur district with 200 bed capacity and 2 other hospitals in G B Nagar with 800 bed capacity.
- **There are 8 Trauma Centers** in the sub region **excluding G B Nagar and Shamli district**. With the total bed capacity of 134 and 24 doctors and 43 nursing staff.
- Maximum number of trauma centers are in Hapur district where 3 Trauma center facilities are available for the general people with 70 bds and about 10 doctors and 13 nursing staff to provide better medical services to the masses.
- Most of these trauma centers are equipped with facilities like Imaging Room, OT, ICU and Resuscitation Area. Whereas, others have facilities like Blood Bank and Rehabilitation Equipment.
- Health scenario on Uttar Pradesh also demands major improvements, with Bulandshahar needing special focus (only 78 PHC including APHC for its 45 lakh population). With regard to health care workers, adequate steps to fill up the vacancies, to ensure doctors at block and for each CHC, need attention.

In Haryana sub-region, improvements planned include a 500 bedded hospital in Faridabad, 200 bedded hospitals in Dharuhera and Rai and upgradation of a Gurgaon hospital to 500 beds. State also plans to add many more courses. Data analysis shows that 14 districts have CT scan facility, MRI scan facility is available in 4 districts and 18 districts have Dialysis centres on PPP model. Further, while Trauma care facilities are proposed to be upgraded to hospitals with ICU facilities, Quality Care shall be considered in all hospitals.



Annexure D-10.2.1

BEST PRACTICES OF PUBLIC-PRIVATE PARTNERSHIP IN HEALTH SECTOR IN INDIA AND HEALTH SECURITY EXAMPLES OF UK AND JAPAN

A) Public-Private Partnership in Health Sector in India

Public-Private Partnership (PPP) in the context of the health sector is an instrument for improving the health of the population. PPP is to be seen in the context of viewing the whole medical sector as a national asset with health promotion as goal of all health providers, private or public. The Private and Non-profit sectors are also very much accountable to overall health systems and services of the country. Therefore, synergies where all the stakeholders feel they are part of the system and do everything possible to strengthen national policies and programmes needs to be emphasized with a proactive role from the Government. The report encapsulates the successful PPP experiences in India.

1. Yeshasvini Health scheme in Karnataka

The Yeshasvini Co-operative Farmer's Healthcare Scheme is a health insurance scheme targeted to benefit the poor. It was initiated by Narayana Hrudayalaya, Superspecialty Heart Hospital in Bangalore, and by the Department of Co-operatives, Government of Karnataka. The Government provides a quarter (Rs. 2.50) of the monthly premium paid by the members of the Cooperative Societies, which is Rs.10 per month. The incentive of getting treatment in a private hospital with the Government paying half of the premium attracts more members to the scheme. The cardholders could access free treatment in 160 hospitals located in all districts of the state for any medical procedure costing upto Rs. 2 lakhs.

The premium is deposited in the account of a charitable trust, the regulatory body for implementing the scheme. A Third Party Administrator- Family Health Plan Limited (FHPL) that is licensed by Karnataka's Insurance Regulatory and Development Authority. The FHPL has the responsibility for administering and managing the scheme on a day-today basis. Recognized hospitals have been admitted to the network throughout Karnataka, which are called as network hospitals (NWH). These hospitals offer comprehensive packages for operations that are paid by Yeshasvini. A Yeshasvini Farmers Health Care Trust is formed to ensure sustainability to the scheme, which comprises of members of the State Government and the network hospitals. The Trust monitors and controls the whole scheme, formulates policies, appointed the TPA and addresses the grievances of the insured members or doctors.

2. ArogyaRaksha Scheme in Andhra Pradesh

The Government of Andhra Pradesh has initiated the ArogyaRaksha Scheme in collaboration with the New India Assurance Company and with private clinics. It is an insurance scheme fully funded by the government. It provides hospitalization benefits and personal accident benefits to citizens below the poverty line who undergo sterilization for family planning from government health institutions. The government paid an insurance premium of Rs. 75 per family to the insurance company, with the expected enrolment of 200,000 acceptors in the first year.

The medical officer in the clinics issues a ArogyaRaksha Certificate to the person who undergoes sterilization. The person and two of her/his children below the age of five years are covered under the hospitalization benefit and personal accident benefit schemes. The person and/or her/his children could get in-patient treatment in the hospital upto a maximum of Rs. 2000 per hospitalization, and subject to a limit of Rs. 4000 for all treatments taken under one ArogyaRaksha Certificate in any one year. She/he gets free treatment from the hospital, which in turn claims the charges from the New India Insurance Company. In case of death due to any accident, the maximum benefit payable under one certificate is Rs. 10,000.



3. Telemedicine initiative by Narayana Hrudayalaya in Karnataka

The Government of Karnataka, the Narayana Hrudayalaya hospital, Bangalore and the Indian Space Research Organization initiated an experimental tele-medicine project called 'Karnataka Integrated Tele-medicine and Tele-health Project' (KITTH), which is an on-line health-care initiatives in Karnataka. With connections by satellite, this project functions in the Coronary Care Units of selected district hospitals that are linked with Narayana Hrudayalaya hospital. Each CCU is connected to the main hospital to facilitate investigation by specialists after ordinary doctors have examined patients. If a patient requires an operation, s/he is referred to the main hospital in Bangalore; otherwise s/he is admitted to a CCU for consultation and treatment. Tele-medicine provides access to areas that are underserved or un-served. It improves access to specialty care and reduces both time and cost for rural and semi-urban patients. Telemedicine improves the quality of health care through timely diagnosis and treatment of patients. The most important aspect of tele-medicine is the digital convergence of medical records, charts, x-rays, histopathology slides and medical procedures (including laboratory tests) conducted on patients.

4. Contracting in Sawai Man Singh Hospital, Jaipur

The SMS hospital has established a Life Line Fluid Drug Store to contract out low cost high quality medicine and surgical items on a 24-hour basis inside the hospital. The agency to operate the drug store is selected through bidding. The successful bidder is a proprietary agency, and the medical superintendent is the overall supervisor in charge of monitoring the store and its functioning. The contractor appoints and manages the remuneration of the staff from the sales receipts. The SMS hospital shares resources with the drug store such as electricity; water; computers for daily operations; physical space; stationery and medicines. The contractor provides all staff salaries; daily operations and distribution of medicine; maintenance of records and monthly reports to SMS Hospital. The SMS Hospital provides all medicines to the drug store, and the contractor has no power to purchase or sell medicines of his own. The contractor gains substantial profits, could expand his contacts and gain popularity through LLFS. However, the contractor has to abide by all the rules and regulations as given in the contract document. The SMS Hospital has also contracted out the installation, operation and maintenance of CT-scan and MRI services to a private agency. The agency is paid a monthly rent by the hospital and the agency has to render free services to 20% of the patients belonging to the poor socio-economic categories.

5. The Uttarakhand Mobile Hospital and Research Center (UMHRC)

It is three-way partnership among the Technology Information, Forecasting and Assessment Council (TIFAC), the Government of Uttarakhand and the Birla Institute of Scientific Research (BISR). The motive behind the partnership was to provide health care and diagnostic facilities to poor and rural people at their doorstep in the difficult hilly terrain. TIFAC and the State Govt. shares the funds sanctioned to BISR on an equal basis.

6. PHC's in Gumballi and Sugganahalli, Karnataka

Management of Primary Health Centers in Gumballi and Sugganahalli was contracted out by the Government of Karnataka to Karuna Trust in 1996 to serve the tribal community in the hilly areas. 90% of the cost is borne by the Govt. and 10% by the trust. Karuna Trust has full responsibility for providing all personnel at the PHC and the Health Sub-centers within its jurisdiction; maintenance of all the assets at the PHC and addition of any assets if required at the PHC. There has been redeployment of the Govt. staff in the PHCs, however some do remain in deputation on mutual consent. The agency ensures adequate stocks of essential drugs at all times and supplies them free of cost to the patients. No patient is charged for diagnosis, drugs, treatment or anything else except in accordance with the Government policy. The staff salaries are shared between the Govt. and the Trust. Gumballi district is considered a model PHC covering the entire gamut of primary health care – preventive, promotive, curative and rehabilitative.

7. Emergency Ambulance Services scheme in Tamil Nadu

The Government of Tamil Nadu has initiated an Emergency Ambulance Services scheme in Theni district of Tamil Nadu in order to reduce the maternal mortality rate in its rural area. The major cause for the high MMR



is anon-medical cause - the lack of adequate transport facilities to carry pregnant women to health institutions for childbirth, especially in the tribal areas. This scheme is part of the World Bank aided health system development project in Tamil Nadu. SevaNilayam has been selected as the potential non governmental partner in the scheme. This scheme is self-supporting through the collection of user charges. The Government supports the scheme only by supplying the vehicles. SevaNilayam recruits the drivers, train the staff, maintain the vehicles, operate the program and report to the government. It bears the entire operating cost of the project including communications, equipment and medicine, and publicizing the service in the villages, particularly the telephone number of the ambulance service. However, the project is not self-sustaining as the revenue collection is lesser than anticipated.

8. Urban Slum Health Care Project, Andhra Pradesh

The Urban Slum Health Care Project the Andhra Pradesh Ministry of Health and Family Welfare contracts NGOs to manage health centers in the slums of Adilabad. The basic objectives of the project are to increase the availability and utilization of health and family welfare services, to build an effective referral system, to implement national health programs, and to increase health awareness and better health-seeking behaviour among slum dwellers, thus reducing morbidity and mortality among women and children. To serve 3 million people, the project has established 192 Urban Health Centers. Five 'MahilaAarogyaSanghams' (Women's Wee-Being Associations) were formed under each UHC, and along with the self-help groups and ICDS workers mobilize the community and adopt Behaviour Change Communication strategies. The NGOs are contracted to manage and maintain the UHCs, and based on their performance, they are awarded with a UHC, or eliminated from the program. Additional District Magistrates and Health Officers supervise the UHCs at district level and the Medical Officer is the nodal officer at the municipality level. The District Committee approves all appointments made by the NGOs for the UHC staff. The Govt. of Andhra Pradesh constructs buildings for the UHCs; provide honoraria to the Project Coordinators of the UHCs, medical officers and other staff; train staff members; and supply drugs, equipment and medical registers.

9. Rajiv Gandhi Super-specialty Hospital, Raichur,

Karnataka The Rajiv Gandhi Super-specialty Hospital in Raichur Karnataka is a joint venture of the Government of Karnataka and the Apollo hospitals Group, with financial support from OPEC (Organization of Petroleum Exporting Countries). The basic reason for establishing the partnership was to give super-specialty health care at low cost to the people Below Poverty Line. The Govt. of Karnataka has provided the land, hospital building and staff quarters as well as roads, power, water and infrastructure. Apollo provided fully qualified, experienced and competent medical facilities for operating the hospital. The losses anticipated during the first three years of operation were reimbursed by the Govt. to the Apollo hospital. From the fourth year, the hospital could get a 30% of the net profit generated. When no net profit occurred, the Govt paid a service charge (of no more than 3% of gross billing) to the Apollo Hospital.

Apollo is responsible for all medical, legal and statutory requirements. It pays all charges (water, telephone, electricity, power, sewage, sanitation) to the concerned authorities and is liable for penal recovery charges in case of default in payment within the prescribed periods. Apollo is also responsible for maintenance of the hospital premises and buildings, and maintains a separate account for funds generated by the hospital from fees for registration, tests and medical charges. This account is audited by a Chartered Accountant engaged by Apollo with approval of the Governing Council. Likewise, Apollo maintains separate monthly accounts for all materials used by patients below the poverty line (including diagnostic services), which are submitted to the Deputy Commissioner of Raichur for reimbursement. Accountability and responsibility for outsourcing the support services remain with the Apollo.

10. Community Health Insurance scheme in Karnataka

The Karuna Trust in collaboration with the National Health Insurance Company and the Government of Karnataka has launched a community health insurance scheme in 2001. It covers the Yelundur and Narasipuram Taluks.



Underwritten by the UNDP, the Karuna Trust undertook the project to improve access to and utilization of health services, to prevent impoverishment of the rural poor due to hospitalization and health related issues, and to establish insurance coverage for out-patient care by the people themselves. The scheme is fully subsidized for Scheduled Castes and Scheduled Tribes who are below the poverty line and partially subsidized for non-SC/ST BPL. Poor patients are identified by field workers and health workers who visit door-to-door to make people aware of the scheme. ANMs and health workers visiting a village collect its insurance premiums and deposit them in the bank.

The annual premium is Rs. 22, less than Rs.2 a month. If admitted to any government hospital for treatment, an insured member gets Rs. 100 per day during hospitalization – Rs. 50 for bed-charges and medicine and Rs. 50 as compensation for loss of wages – up to a maximum of Rs.2500 within a 25-day limit. Extra payment is possible for surgery. The insurance is valid for one year. If members want to continue the coverage, they must renew their membership and pay the full premium.

Besides, the 108 helpline set up by the Government and in partnership with private organisations such as Ziqitza Health Care Ltd can help stay ahead of fatal emergencies. As an example of how the initiative is making waves across the country, a woman in rural Madhya Pradesh was able to safely deliver her baby thanks to the dedicated and efficient crew manning the ambulance. In Odisha too, 108 ambulance services responded to a call about an anaemic patient who was rushed to the nearest hospital in time where a crew member stepped in to donate blood and save the man's life.

Apart from the above examples of successful PPP's instrumented by healthcare sector in India there are numerous examples wherein innovative models are being envisaged to provide a robust healthcare framework in the country. Some of the projects in the pipeline include setting up of the diagnostic centres at the district hospitals of Pithoragarh and Kotdwara in Uttaranchal, establishing 200 bedded secondary level hospitals in Delhi under the PPP model.

Such cases only serve to highlight the need for Public Private Partnerships (PPP) across the country. Under this model, the infrastructure and marketing needs of the hospitals are handled by the Government, while the private establishments only need to invest in the medical professionals and equipment. As a result, not only is the level of healthcare services provided enhanced, but the costs are brought down as well.

The lack of manpower in the public sector, along with disorganized management, outdated infrastructural capabilities, and the absence of a risk mitigation system for poorer customers, is a major challenge plaguing it today. A public private partnership in healthcare will lead to an increase in the number of premier medical institutions, and as a result, would create an influx of highly skilled medical professionals in the sector.

Although, India has had some limited experience with PPP in healthcare, many states like West Bengal, Maharashtra and Bihar had entered into PPPs for specific clinical and diagnostic services MRI and CT scan. Even more difficult is the model to be chosen. A workable model could be infrastructure and services combined that can deliver outcome-based services, with payment made on a capitation basis. At present, 100 per cent FDI is allowed in the healthcare sector in greenfield projects. Capital will always flow from any part of the world to India, if the return is safe and assured of. Importance would be designing the right model; of even greater importance would be executing it.

B) Health Security Examples of UK and Japan

Health Security in UK- England

Health services in England are largely free. The National Health Scheme (NHS) established in 1948 provides preventive medicine, primary care and hospital services to all those “ordinarily resident”. Over 12% of the population is covered by voluntary health insurance schemes, known Private Medical Insurance (PMI), which mainly provides access to acute elective care in the private sector. Responsibility for publicly funded health care rests with the Secretary of State for Health, supported by the Department of Health. The Department



operates at a regional level through 10 strategic health authorities (SHAs), which are responsible for ensuring the quality and performance of local health services within their geographic area. Responsibility for commissioning health services at the local level lies with 151 primary care organizations, mainly primary care trusts (PCTs), each covering a geographically defined population. Health services are mainly financed from public sources – primarily general taxation and national insurance contributions (NICs). Some care is funded privately through PMI, some user charges, cost sharing and direct payments for health care delivered by NHS and private providers. The picture below will provide an overview on health security of system in UK.

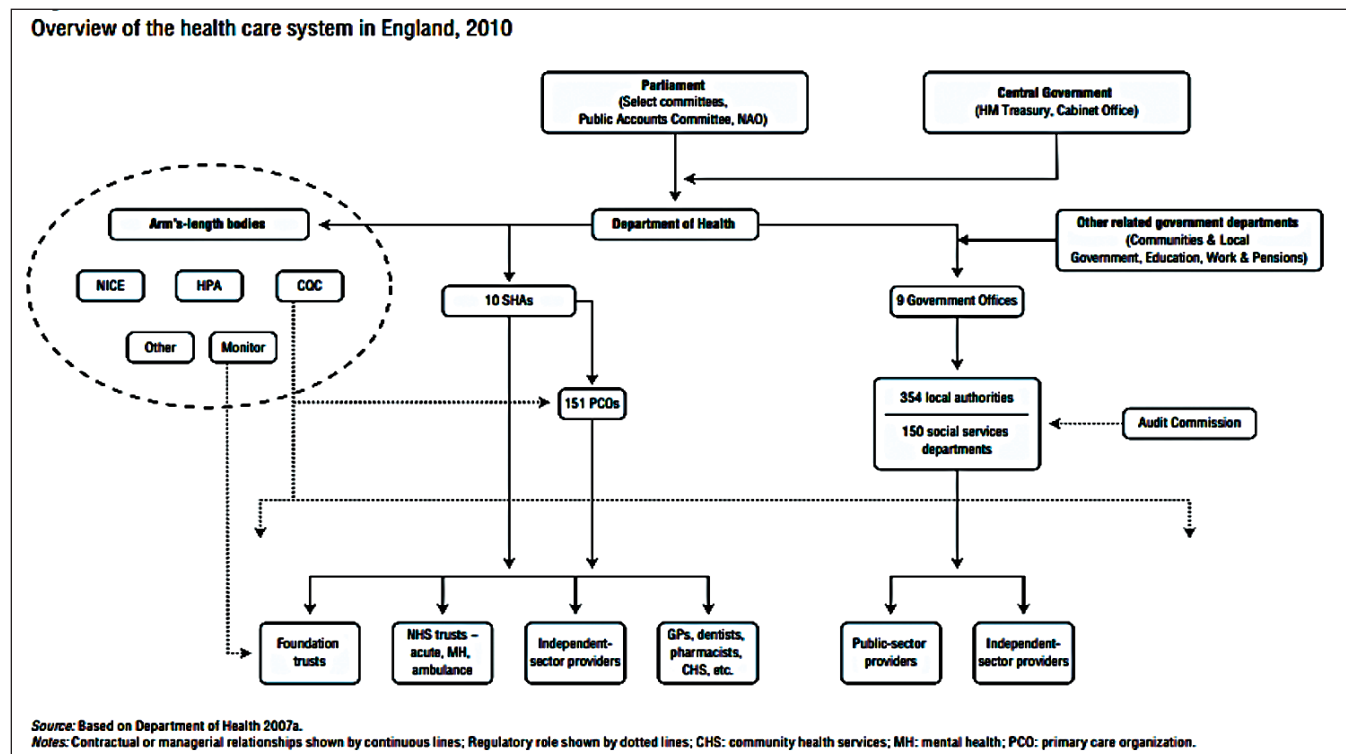


Figure D-10.2.1.1 Overview of UK Health System 2010

Source: https://www.euro.who.int/_data/assets/pdf_file/0004/135148/e94836.pdf

Health Security in Japan

With rapidly aging population with those aged 65 or over accounting for 27.4% of the population, declining fertility rate and changing demographic division, the users of social and health services are increasing in Japan. Ministry of Health, Labor and Welfare (MHLW) is responsible for providing health care and health security services in the country and has been categorized as Social Insurance System. Japanese citizens are insured under Universal Health Insurance scheme and have freedom to access health care facilities and a wide range of medical services for a relatively low co-payment.

As the number of people in working population decreases and the number of dependents or elderlies are increasing the pressure on Japan's social insurance scheme tends to create challenges among the policy makers to provide best health care facilities to its citizens. However, All Japanese citizens must join the health insurance scheme according to employment status, accommodation, and age. Although thousands of independent insurers exist, they are all integrated into a uniform framework that is mandated by the national government. The Japanese health system is based on fee-for-service reimbursement under a uniform national tariff schedule. The health insurance scheme is categorized into three basic groups according to age and employment status: the Employees' Health Insurance scheme (EHI) for employees and their dependents; the National Health Insurance scheme (NHI) for the self-employed, farmers, the retired and their dependents; and the Late-Stage Medical Care Scheme for the Elderly.



The figure D-10.2.1.2 will provide an outlook on Japan's (Social Insurance) Health Policy

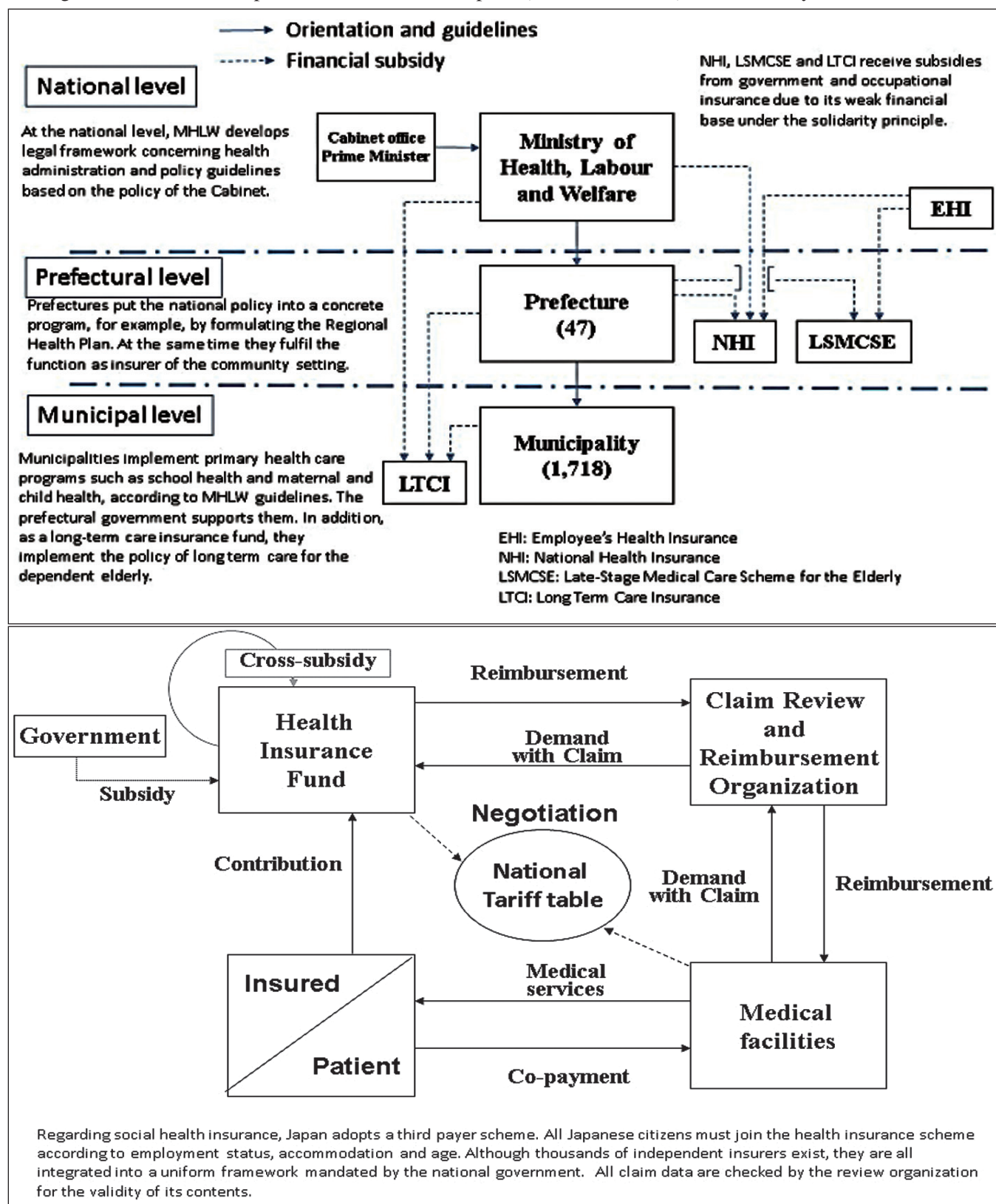


Figure D-10.2.1.2 : Health Insurance Model in Japan

Source: Matsuda S. Health Policy in Japan – Current Situation and Future Challenges. JMA J. 2019;2(1):1-10.

<https://www.jmaj.jp/detail.php?id=10.31662%2Fjmaj.2018-0016#:~:text=Since%20the%20establishment%20of%20the,a%20relatively%20low%20co%2Dpayment.>



HEALTH SECTOR INITIATIVES OF GOVT. OF INDIA

A. Ministry of Health and Family Welfare

Health being a State subject, the Central Government supplements the efforts of the State Governments in delivery of health services through various schemes of primary, secondary and tertiary care. Names of such Central Sector and Centrally Sponsored Schemes of the Ministry of Health and Family Welfare are as below⁴:

Central Sector Schemes

1. Pradhan MantriSwasthya Suraksha Yojana
2. National AIDS and STD Control Programme
3. Family Welfare Schemes
4. Establishment and strengthening of NCDC Branches and Health Initiatives, Inter Sectoral co-ordination for preparation and control of Zoonotic Diseases and other neglected tropical diseases, Surveillance of Viral Hepatitis, Anti Microbial Resistance
5. National Pharmacovigilance Programme
6. Development of Nursing Services
7. Health Sector Disaster Preparedness and Response and Human Resources Development for Emergency Medical Services
8. National Organ Transplant Programme
9. Impacting Research Innovation and Technology (IMPRINT) Scheme.
10. Swachhta Action Plan (SAP)

Centrally Sponsored Schemes:

A. National Health Mission (NHM)

1. National Rural Health Mission (NRHM):

- i) RCH Flexible Pool including Routine Immunization Programme, Pulse Polio Immunization Programme, National Iodine Deficiency Disorders Control Programme etc.
- ii) Health Systems Strengthening under NRHM
- iii) Flexible Pool for Communicable Diseases
- iv) Flexible Pool for Non-Communicable Diseases, Injury and Trauma
- v) Infrastructure Maintenance
- vi) Forward linkages to NRHM
- vii) Strengthening of State Drug Regulatory System
- viii) Pilot Schemes(Sports medicine, Deafness, Leptospirosis Control, Control of Human Rabies, Medical Rehabilitation, Oral Health, Fluorosis)
- ix) Human Resources for Health
- x) Strengthening National Programme Management of the NRHM

2. National Urban Health Mission

⁴<https://pib.gov.in/Pressreleaseshare.aspx?PRID=1542736>



3. Tertiary care Programmes:

- i) National Mental Health Programme
- ii) Capacity Building for Trauma Centres
- iii) National Programme for prevention and control of Cancer, Diabetes, Cardio-vascular Diseases and Stroke
- iv) National Programme for Health Care for the Elderly
- v) National Programme for Control of Blindness
- vi) Telemedicine
- vii) Tobacco Control Programme and Drug De-addiction Programme

4. Human Resources for Health and Medical Education

- i) Upgradation /Strengthening of Nursing Services (ANM/GNM)
- ii) Strengthening /Upgradation of Pharmacy School/College
- iii) District Hospital – Upgradation of State Government Medical Colleges(PG seats)
- iv) Strengthening Government Medical Colleges(UG seats) and Central Government Health Institutions
- v) Establishing New Medical Colleges(upgrading District Hospitals)
- vi) Setting up of State Institutions of Para-medical Sciences in States and Setting up of College of Para-medical Education.

B. Rashtriya Swasthya Bima Yojana

More information about the above Govt. of India initiatives are provided as following:

1. Hospitals and diagnostic centers attracted **Foreign Direct Investment (FDI)** worth US\$ 6.72 billion between April 2000 and March 2020, according to the data released by Department for Promotion of Industry and Internal Trade (DPIIT)⁵.
2. In August 2019, Microsoft India and Apollo Hospitals Group entered in agreement to set up a National Clinical Coordination Committee for AI-powered Cardiovascular Disease Risk Score API.
3. In April 2020, first COVID-19 sample collection mobile lab of the country, namely ‘Mobile BSL-3 VRDL Lab’, was launched, which can process more than 1,000 samples in a day and enhance country’s capabilities in fighting COVID-19.
4. On September 23, 2018, Government of India launched **Pradhan Mantri Jan ArogyaYojana (PMJAY)**, to provide health insurance worth Rs 500,000 (US\$ 7,124.54) to over 100 million families every year. The Government has announced Rs 69,000 crore (US\$ 9.87 billion) outlay for the health sector that is inclusive of Rs 6,400 crore (US\$ 915.72 million) for PMJAY in Union Budget 2020-21.

Box No. D-10.2.2.1 Key Features of PM-JAY (As per Workshop)

1. PM-JAY provides cashless access to health care services for the beneficiary at the point of service, that is, the hospital.
2. PM-JAY⁶ envisions to help mitigate catastrophic expenditure on medical treatment which pushes nearly 6 crore Indians into poverty each year.
3. It covers up to 3 days of pre-hospitalization and 15 days post-hospitalization expenses such as diagnostics and medicines.
4. There is no restriction on the family size, age or gender.
5. All pre-existing conditions are covered from day one.
6. Benefits of the scheme are portable across the country i.e. a beneficiary can visit any empanelled public or private hospital in India to avail cashless treatment.
7. Services include approximately 1,393 procedures covering all the costs related to treatment, including but not limited to drugs, supplies, diagnostic services, physician’s fees, room charges, surgeon charges, OT and ICU charges etc.
8. Public hospitals are reimbursed for the healthcare services at par with the private hospitals.

⁵<https://www.ibef.org/industry/healthcare-india.aspx>

⁶<https://pmjay.gov.in/about/pmjay>



The Government of India is planning to increase public health spending to 2.5 per cent of the country's GDP by 2025.

5. In February 2019, the Government of India established a new All India Institute of Medical Sciences (AIIMS) at Manethi, District Rewari, Haryana at a cost of Rs 1,299 crore (US\$ 180.04 million).
6. The Union Cabinet approved setting up of **National Nutrition Mission (NNM)** with a three-year budget of Rs 9,046 crore (US\$ 1.29 billion) to monitor, supervise, fix targets and guide the nutrition related interventions across ministries.
7. In Union Budget 2020-21, Rs 35,600 crore (US\$ 5.09 billion) has been allocated for nutrition-related programmes.
8. In August 2018, the Government of India approved **Ayushman Bharat-National Health Protection Mission** as a centrally sponsored scheme contributed by both center and state Government at a ratio of 60:40 for all States, 90:10 for hilly Northeastern States and 60:40 for Union Territories with legislature. The center will contribute 100 per cent for Union Territories without legislature.
11. Under the **National Health Mission**⁶, the government has launched several schemes like:
 - 11.1. **Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A)** programme essentially looks to address the major causes of mortality among women and children as well as the delays in accessing and utilizing health care and services. It also introduces new initiatives like the use of Score Card to track health performance, National Iron + Initiative to address the issue of anemia across all age groups and the Comprehensive Screening and Early interventions for defects at birth, diseases, and deficiencies among children and adolescents.
 - 11.2. **Rashtriya Bal Swasthya Karyakram (RBSK)** is an important initiative aiming at early identification and early intervention for children from birth to 18 years to cover 4 'D's viz. Defects at birth, Deficiencies, Diseases, Development delays including disability. Early detection and management diseases including deficiencies bring added value in preventing these conditions to progress to its more severe and debilitating form
 - 11.3. **The Rashtriya Kishor Swasthya Karyakram** - The key principle of this programme is adolescent participation and leadership, Equity and inclusion, Gender Equity and strategic partnerships with other sectors and stakeholders. The programme enables all adolescents in India to realize their full potential by making informed and responsible decisions related to their health and well-being and by accessing the services and support they need to do so.
 - 11.4. The government of India has launched **Janani Shishu Suraksha Karyakaram** to motivate those who still choose to deliver at their homes to opt for institutional deliveries. It is an initiative with a hope that states would come forward and ensure that benefits under JSSK would reach every needy pregnant woman coming to government institutional facility. Since the rate of deaths in the country because of communicable and non-communicable diseases is increasing at an alarming rate, the government has introduced various programmes to aid people against these diseases.
 - 11.5. **National AIDS Control Organisation** was set up so that every person living with HIV has access to quality care and is treated with dignity. By fostering close collaboration with NGOs, women's self-help groups, faith-based organizations, positive people's networks, and communities, NACO hopes to improve access and accountability of the services. It stands committed to building an enabling environment wherein those infected and affected by HIV play a central role in all responses to the epidemic – at state, district and grassroots level.
 - 11.6. **Revised National TB Control Programme** is a state-run tuberculosis control initiative of Government of India with a vision of achieving a TB free India. The program provides, various free of cost, quality tuberculosis diagnosis and treatment services across the country through the government health system.
 - 11.7. **National Leprosy Eradication Programme** was initiated by the government for Early detection through active surveillance by the trained health workers and to provide Appropriate medical rehabilitation and leprosy ulcer care services.

⁶<https://www.oxfamindia.org/blog/15-healthcare-schemes-india-you-must-know-about>



- 11.8. The Government of India has launched **Mission Indradhanush** with the aim of improving coverage of immunization in the country. It aims to achieve at least 90 percent immunization coverage by December 2018 which will cover unvaccinated and partially vaccinated children in rural and urban areas of India.
- 11.9. In order to address the huge burden of mental disorders and the shortage of qualified professionals in the field of mental health, Government of India has implemented National Mental Health Program to ensure the availability and accessibility of minimum mental healthcare for all in the foreseeable future.
- 11.10 **Pulse Polio** is an immunization campaign established by the government of India to eliminate polio in India by vaccinating all children under the age of five years against the polio virus.
- 11.11 The **Pradhan Mantri Swasthya Suraksha Yojana (PMSSY)** was announced with objectives of correcting regional imbalances in the availability of affordable/ reliable tertiary healthcare services and also to augment facilities for quality medical education in the country by setting up of various institutions like AIIMS and upgrading government medical college institutions.
- 11.12 Since there are huge income disparities, therefore, the government has launched several programmes in order to support the financially backward class of the country. As about 3.2 crore people in India fall under the National Poverty line by spending on healthcare from their own pockets in a single year. The most important programme launched by the government is **Rashtriya Arogya Nidhi** which provides financial assistance to the patients that are below poverty line and are suffering from life-threatening diseases, to receive medical treatment at any government run super specialty hospital/ institution.
- 11.13 **National Tobacco Control Programme** was launched with the objective to bring about greater awareness about the harmful effects of tobacco use and about the **Tobacco Control Laws** and to facilitate the effective implementation of the Tobacco Control Laws.
- 11.14 **Integrated Child Development Service** was launched to improve the nutrition and health status of children in the age group of 0-6 years, lay the foundation for proper psychological, physical and social development of the child, effective coordination and implementation of policy among the various departments and to enhance the capability of the mother to look after the normal health and nutrition needs through proper nutrition and health education.
- 11.15 **Rashtriya Swasthya Bima Yojana** is a government-run health insurance programme for the Indian poor. It aims to provide health insurance coverage to the unrecognized sector workers belonging to the below poverty line and their family members shall be beneficiaries under this scheme.

B. National Medical Commission Reforms

Ministry of Health and Family Welfare introduced The National Medical Commission Bill 2019 in Lok Sabha to repeal/annul the Medical Council of India Act of 1956 with an aim to develop and regulate medical institutions, profession and education in the country and to address shortcomings in the process of regulating medical colleges in the country. The bill becomes an Act with the approval of both the houses and the President of India on 08th August 2019.

At the central level, National Medical Commission (NMC) is an regulating body consisted of 25 members (appointed by Cabinet Secretary and five experts nominated by the central government through a search committee) regulating medical education and practice in India and at the state level, state governments will ensure establishing State level Medical Commission with the similar role to NMC within the three years of the act.

C. Ministry of AYUSH

1. **National Ayush Mission (NAM)**⁷, a centrally sponsored scheme was launched in 2014 with the basic objective of promoting Ayurveda, Yoga, Siddha & Unani and Homoeopathy (AYUSH) medical system through cost effective

⁷National Ayush Mission- Framework For Implementation <https://main.ayush.gov.in/sites/default/files/National%20AYUSH%20Mission%20.pdf>



services, strengthening of educational systems, sustainable availability of ASU&H raw-materials and facilitate the enforcement of quality control of (ASU&H) drugs. The mission envisages flexibility of implementation of programmes leading to sustainable participation of the state governments and that of Union territories. The NAM intends to build on India's unique heritage represented by its ancient systems of medicine like Ayurveda, Yunani, Sidhha, Unani and Homeopathy, the knowledge of preventive and promotive health care. In order to provide supporting facilities under the mission and to strengthen the AYUSH infrastructure at both attached Central and State levels, financial assistance for setting up of the Programme Management Units (PMU's) was to be provided. The PMU will consist of management and technical professionals both at Central and State level.

For effective monitoring and evaluation of the implementation, a dedicated Management Information System monitoring and evaluation cell will be established at Centre/ State level. Concurrent evaluation of the AYUSH Mission will be carried out to know the implementation progress, scope for improvement and bottlenecks. Third party evaluation after completion of two years of Mission implementation is also planned. The Objectives of NAM were:

- a) To provide cost effective and impartial AYUSH health care.
- b) To rejuvenate and promote the AYUSH medical systems.
- c) To advance educational institutions capable of conveying quality AYUSH education.
- d) To encourage the acceptance of quality standards of AYUSH drugs.
- e) To encourage the availability of the sustained supply of AYUSH raw materials.

2. Scheme for Extra Mural Research⁸ is designed to encourage R&D in priority areas based on disease burden in alignment to National Health programme. It also aims to utilize the vast research infrastructure available within the country for standardization and validation of classical drugs. This scheme is meant for focused outcome in tandem with the needs of AYUSH sector and also encourages young scholars of AYUSH system, to use their wisdom and energy in the research of AYUSH system on modern scientific parameters. The objectives of Extra Mural Research Scheme are:

- a) To support Research and development in Extra Mural mode for treatment of prioritized diseases.
- b) To Standardize/validate and develop scientific evidence for safety, efficacy and quality of AYUSH drugs & therapies.
- c) To make scientific exploration of AYUSH system with interdisciplinary approaches.
- d) To achieve need based outcome in priority areas.
- e) To develop the potential of Human Resource in AYUSH system specially to inculcate aptitude and expertise to AYUSH systems.

⁸ <https://ccrum.res.in/ViewData/Multiple?mid=1584&mid=1584&https://main.ayush.gov.in/sites/default/files/Final%20Revised%20Scheme%20Circulated.pdf>



Annexure D-10.2.3

SHORTAGE OF DOCTORS

1. **Shortage of Doctors** is undoubtedly the biggest crisis facing the healthcare industry. In India, it is estimated that we have a shortage of 5 lakh doctors. We produce only 50,000 MBBS graduates every year and it takes 8-10 years to become a doctor. At this rate, it will take decades to match the supply with ever increasing demand. And the situation is not better in developed world either. An alternative solution is to massively increase the **efficiency** of these care providers using technology.
2. India has one doctor for every 1,445 citizens —below the WHO's prescribed norm of one doctor for 1,000 people. And it has only 1.7 nurses per 1,000 people against the prescribed minimum of three.
3. A doctor's job description is to cure patients. Today, a doctor understands the symptoms, looks at any available past records provided by the patients and then based on her experience and education prescribes tests and medicine. More often than not, the diagnosis is a trial and error process. Now there is no substitute to the experience, intuition, and human touch of a doctor, the data based decision making (symptoms, records, test results) is better and faster done by computers just because of their ability to absorb and process terabytes of data as described in the IBM Watson example above. This is not just important for a quick diagnosis but also for an accurate diagnosis. A study by John Hopkins found that more than 40,000 patients in the US die in ICU each year due to misdiagnosis. Trial and error has no place in 21st century.
4. The ability to process huge data in healthcare also means we can feed in many more data points. Physical activity data tracked by your smartphone, heart beat data recorded by your smart band, your calorie intake data, your genetic profile, your sleep patterns, and even your drug adherence can be fed into a clinical decision support system to arrive at the right diagnosis and prescribe a treatment suited to you as in individual. A startup in Australia DoseMe allows doctors to dose a patient based on their own ability to absorb, process, and clear a drug. It does that by analyzing the patient's personal data. By continuous and remote monitoring of this data, healthcare will move more towards prevention than cure. Early signs of strokes and attacks can be captured by wearables and acted upon much before the situation worsens. This shift will reduce the number of visits to doctors, increasing the efficiency of the system. Doctors can even do digital rounds by remotely monitoring the vitals and data fed by support staff.
5. Healthcare communication is very complex. A doctor interacts with 100s of other doctors, nurses, technicians, paramedics, pharma reps, and others in year. But the state of communication in healthcare is deplorable. With lack of such study in India, a study by Ponemon Institute of more than 400 U.S. healthcare providers found that hospitals in the US waste more than US\$11bn a year on inefficient communication.
6. EHRs are being given a huge push but they have only compounded the problems. A doctor instead of paying complete attention to a patient is supposed to listen and write down stuff on a screen at the same time. There is an urgent need to re-imagine EHR. In the current form it is more of a liability than an asset and definitely not encouraging for providers to sign up to.
7. Better communication tools between a doctor and her support staff can enable support staff to take up more responsibility under virtual supervision of a doctor. This has real potential to massively increase the efficiency of doctors and drive down the costs.
8. One more problem especially visible in India is a huge divide between Tier 1 cities and the rest. There is an abundance of doctors in metros while there is an acute shortage in the rest of the country. The major reason is the lack of infrastructure and lifestyle in India beyond metros. Now this is a perfect use case for telemedicine. It will provide opportunities for excess supply to meet excess demand reducing pressure on strained infrastructure. The divide is also visible in the continuous education of doctors. With digital mediums, the knowledge of and access to the latest in medicine can be provided immediately to doctors across regions. And with social



communication tools for doctors, the small town physicians and metro based specialists can interact and diagnose fast.

9. Some of the technologies mentioned above are still in development but they will be available soon. But a lot of these are readily available to use. Adoption is a tough ask when it comes to technology adoption in healthcare but that's not a difficult nut to crack if you figure out the right value propositions for the end users of the product. Technology may never completely replace doctors but it will sure as hell massively increase their efficiency and bring an exponential change in the entire healthcare system. The system as we know it will not be the same in a decade's time.



Annexure D-10.2.4

AYUSHMAN BHARAT (HEALTH & WELLNESS CENTERS & PRADHAN MANTRI JAN AROGYA YOJNA)

Ayushman Bharat adopts a continuum of care approach, comprising of two inter-related components, one is Health and Wellness Centres (HWCs) and another is Pradhan Mantri Jan Arogya Yojana (PM-JAY). Health and Wellness Centres (HWCs) under 'Ayushman Bharat' are being developed by transforming the existing Sub Centres and Primary Health Centres. These centres are to deliver Comprehensive Primary Health Care (CPHC) bringing healthcare closer to the homes of people.

Detail about Universal Health Coverage: under Ayushman Bharat

- i) Primary-Comprehensive Primary Health Care through Health & Wellness Centres (HWCs) and Unmet needs NCDs and chronic disease.
- ii) Referral/Gatekeeping- Follow-up Preventive, Promotive, Curative, Rehabilitative & Palliative Care
- iii) Service Packages
- iv) Health & Wellness Centre
 - a) *Sub Health Centres (SHC) (@5000 in plain areas and 3000 in hilly and tribal areas)*
 - b) *Primary Health Centres (PHC) (@30,000) / UPHC (@50,000)*
- v) Medicines and Diagnostics- Establishment of effective Hub and Spoke models for diagnostic services at different levels
- vi) Medicines
 - a) *Essential List of Medicines to be expanded for expanded range of services*
 - b) *CHO to be able to dispense medicines for chronic diseases on the prescription of the Medical Officer*
 - c) *Uninterrupted Availability of medicines to ensure adherence and continuation of care (Eg: HT/DM/ Epilepsy/COPD)*
- vii) Population Enumeration
 - a) List all households/ families and all individuals in the catchment area/Registration of all individuals at the HWC
 - b) ASHAs conduct household visits for filling family folder and Community based assessment checklists
 - c) Filled formats are submitted to HWC for records maintenance and digitization by use of CPHC – IT application
 - d) Unique Health ID to be issued by HWC by the IT application
- viii) Community Mobilization and Health Promotion
 - a) HWC Convergence with Eat Right Movementz
- ix) The Eat Right Movement” of Food Safety and Standards Authority of India (FSSAI)- built on two broad pillars - **“Eat Healthy” and “Eat Safe”**
 - a) Nutrition for first 1000 days of life
 - b) Dietary risk Factors for NCDs
 - c) Food Safety
 - d) **‘Eat Right’ toolkit designed ,it will start in 2021**
 - e) Convergence of HWC with Swasth Bharat Yatra, India’ a Pan-India Cyclothon.
 - f) Promoting Wellness through Yoga
- x) Yoga mainstreamed into the health care delivery system,
- xi) Close coordination with Ministry of AYUSH/Department of AYUSH at the state and district level. yt



- xii) Pool of Local Yoga Instructors at the HWC level being identified
- xiii) Training and certification of local Yoga Teachers to be steered by Department of AYUSH
- xiv) Weekly/monthly schedule of classes for Community Yoga Training at the HWCs
- xv) Provision for additional remuneration to in house yoga teacher or in sourced yoga instructor
 - a) Robust IT System – to meet diverse needs of different stake holders
- xvi) Comprehensive IT solution integrated with existing applications/ portals (RCH/ NIKSHAY/IDSP/HMIS) to support service delivery and continuum of care for all existing and new package of services envisioned at HWCs.
 - a) Health ID, Enrollment, Family Folder, CBAC
 - b) Modular, open, secure Health Platform for scalability, performance and interoperability
 - c) Job Aids for Service providers and FLWs
 - d) Follow-ups, Workplans, Dashboards, Awareness and Training material for Health workers.
 - e) Patients Follow up by FLWs- Use of SMS based service
 - f) Patient assessment, Examination, Lab investigations, Diagnosis, Treatment – PHC level and above
 - g) Auto-populated drug-list and drug stock dispensed
 - h) Referral pathway for patient info from SC, PHC and CHC
 - i) Disease and Program protocols support for MO and SC team; Triage by Nurse at PHC to minimize data entry by MO
 - j) Dashboards from national level to state, district, PHC, SC and village levels
- xvii) Applications across different levels -
 - a) ASHA Mobile App ,
 - b) SC Tablet App
 - c) PHC MO Web Portal
 - d) CHC Portal
 - e) Admin Portal
 - f) Health Officials Dashboard
 - g) Clinical Decision Support System with AIIMS
 - h) Using **Technology: Continuum of Care to Capacity Building**
- xviii) Telemedicine
 - a) National Medical College Network facility
 - b) Create a pan India tele-education, specialist consultation and e-library
 - c) Telemedicine roll out: AP, Assam, Jharkhand, Karnataka, Meghalaya, Mizoram, Tamil Nadu, Tripura and UP.
 - d) Initially, between PHC-HWCs and State Hubs and Medical College networks
 - e) States encouraged to expand to all functional HWCs of 2018-19 by January 2020
- xix) Extension for Community Healthcare Outcomes ECHO
 - a) ECHO programs, or “clinics,” follow a consistent format.
 - b) Hub and Spoke model: Fortnightly Video conferences: experts at hub site “meet” with providers at spoke sites
 - c) Short didactic by experts, followed by Q&A
 - d) Spoke participants present clinical cases using a standard template
 - e) Mode: All learn, all teach



Annexure D-10.2.5

NATIONAL AMBULANCE CODE BY GOVT OF INDIA IN 2014

1. National Ambulance code⁹ Dawn of A New Era in Quality of Ambulance Design¹⁰. Sick and injured are not cargo to which ordinary rules of logistics can be applied. They are perishable and hence they must be evacuated in comfort and provided with all requisite lifesaving support, en route to the medical establishment. The aforementioned lines from the *US Field Ambulance Manual* very beautifully encapsulate the basic principles of transferring patients in ambulances and are true globally. The Indian public healthcare system has in the last decade increased its investment into pre-hospital patient transport with over 20,000 ambulances being inducted in over 30 states/UT's under the National Health Mission. The private healthcare sector was also not far behind and has also augmented its investment in ambulance services. This transformative change in the public healthcare system of the country was accompanied with additional responsibility on healthcare providers of procuring quality ambulances at rational prices – a task which may appear simpler than it actually is because of the peculiarities of the operational and regulatory environment.
2. To delve deeper, it needs to be understood that all road ambulances are invariably a vehicle first and a medical care environment later. Hence, they primarily fall under the regulatory framework applicable to all vehicles plying on Indian roads viz. Central Motor Vehicle Rules (CMVR) and the Motor Vehicles Act (MVA) as amended from time to time. Rule 126 of CMVR mandates that every manufacturer of motor vehicles shall submit a prototype vehicle tested and as per Section 32 of MVA, there can be no change in particulars mentioned in registration certificate of a vehicle (e.g. seating capacity).
3. These regulations posed a unique challenge for ambulance purchasers as majority of base vehicles of ambulances were usually sold as passenger /goods vehicles and subsequently fabricated and retro-fitted to convert them into ambulances. This in turn meant that after fabrication, either every purchaser needed to get a prototype of finished product tested as per CMVR or take risk of violating the regulatory framework by registering the base vehicle and ply an altered one on the roads – which often the case was.
4. Then there were other challenges as automobile components are usually not the same as the ones used by them on a daily basis. A simple corollary is the way we charge our mobile phones in vehicles wherein a car charger is not the same as our routine wall charger. Similarly, in vehicles, air conditioning capacity is not defined in tons, which is often the case in our daily life. Storage spaces in automobiles pose another challenge as unless appropriately latched, the contents would scatter around when the vehicle is in motion while too secure a latching may make storage spaces in-accessible for medical care providers in times of need.
5. From medical care perspective too, ambulances have certain peculiarities which are different from hospital environments which majority of healthcare providers are accustomed to – the foremost difference being that while hospitals are stationary, ambulances are mobile. Hence, medical devices used in ambulances must be motion tolerant, 12/24V DC powered (if electrically powered) and should be securely wall/roof/floor mounted to ensure they don't become a projectile in moving vehicle or brakes hard. After all, the passenger car seats cant be flying in air when car breaks or standard car accessories falling off in a mobile environment.
6. This is so because Automobile Industry Standards (AIS) define the anchorage strength for all standard fitments like seats, fixtures etc. and it is mandatory for automobile manufacturers to comply with them. But the same was never mandatory for ambulances as majority of medical equipment like stretchers, etc. were retro-fitted and equipment specifications never detailed motion specific mounting requirements due to ignorance amongst healthcare providers which was primarily because of the fact that they have not been exposed to such challenges during their training and practice. To mitigate such challenges in mobile environments, solutions like dial type

⁹http://www.nisc.gov.in/PDF/AIS_125.pdf

¹⁰Dr Angel Rajan Singh, Assistant Professor of Hospital Administration and Project Officer, National Cancer Institute, AIIMS



flowmeter, etc. are easily available in the market but were not prescribed as they are not in wide use in the hospital environment.

7. Working Group on Emergency Care setup by MoRTH in 2011 had observed that real concept of an ambulance is missing in India and recommended that there is a need to formulate National *Ambulance Code* with necessary amendments in CMVR. In line with this recommendation, Ministry on May 30, 2013 approved the *National Ambulance Code* drafted by a multi-disciplinary committee as Automotive Industry Standard-125 (AIS-125) and on Sept. 8, 2016 notified the necessary amendments in CMVR, thereby making compliance with AIS-125 (Part 1) mandatory for all road ambulances manufactured on and after April 1, 2018.
8. National Ambulance Code (AIS-125) specifies the constructional and functional requirements of Category M (four wheelers) and L (two and three wheelers) vehicles used for transport and / or emergent care of patients (road ambulance). AIS-125 for the first time in the history of India legally enshrines the definition of a road ambulance as *road ambulance or ambulance is a specially equipped and ergonomically designed vehicle for transportation/emergent treatment of sick or injured people and capable of providing out of hospital medical care during transit/when stationary, commensurate with its designated level of care when appropriately staffed*. It further classifies the road ambulances as:
 - Type A: Medical first responder. Primarily focused on two wheeler ambulances designed to provide care to patients at the site of medical emergency.
 - Type B: Patient transport vehicle. For transporting patients who are not expected to become emergency patients, for example, patients going for elective diagnostics, etc.
 - Type C: Basic life support ambulance. For transport and care of patients requiring non-invasive airway management/basic monitoring.
 - Type D: Advanced life support ambulance. For transport and care of patients requiring invasive airway management/intensive monitoring.
9. Ambulance code also addresses other vehicle specific parameters like seating, electricals, fire safety, stretcher loading angle, etc., with a view to simplify the matters for healthcare providers who are often not well versed in automobile engineering aspects. *With the NAC in place, all the healthcare provider needs to specify for the base ambulance vehicle is that the vehicle should be as per AIS-125 (Part 1)*. The code also negates the requirement of cramping the patient compartment with additional seats to meet CMVR M2 category requirements of nine passenger seats as it enables stretchers to be accounted for four passenger seats and also prescribes minimum seating requirements for each category of ambulances.
10. Ambulance code also standardizes the recognition and visibility requirements of ambulances. Special stress has been laid on increasing the conspicuity of ambulances on the road such that these vehicles shall be uniformly identifiable across the country.



Annexure D-10.2.6

RELEVANT EXTRACTS OF THE GUIDELINES¹¹ FOR CENTRALLY SPONSORED SCHEME FOR ESTABLISHMENT OF NEW MEDICAL COLLEGES ATTACHED WITH EXISTING DISTRICT/REFERRAL HOSPITALS

The centrally sponsored scheme aims to establish 58 medical colleges by upgrading district/referral hospitals in underserved districts of the country in the first phase of its implementation and 24 hospitals in second phase and 75 in the third phase of the scheme.

Funds will be shared between the Central Government and States in the ratio of 90:10 for NE/special category states and 75:25 for other states to meet the shortfall of human resources in the health care sector of the country.

The objectives of the schemes are as follows:

- To establish 58 medical colleges with intake capacity of 100 in each to increase 5800 seats at the undergraduate level in Government sector.
- To bridge the gap in number of seats available in government and private sector to ensure availability of more MBBS seats for students who cannot afford costly medical education in private sector.
- To mitigate the shortage of doctors by increasing the number of undergraduate seats in the country for equitable health care accessibility across the states.
- To utilize existing infrastructure of district hospitals for increasing undergraduate seats in a cost-effective manner by attaching new medical college with existing district/referral hospitals.
- Creation of additional human resource in health sector to meet the health care needs of the growing population

Under the scheme, district/referral hospitals will be selected after consultation with the states after careful identification of presence of no medical college in that district, district hospital having a bed strength of 200 or more and preference will be given to districts in underserved areas.

The scheme will create an additional 10,000 MBBS and 8000 post graduate seats in the country, this will help in reducing the gap between the doctor per 000'population, as per WHO norms, there should be one doctor over 1000 population and in India as per HLEG report one doctor is catering to almost 2000 people, which is double the population recommended by WHO.

1. **Criteria-** Criteria for identification of Districts under the Scheme:

The district/referral hospitals to be covered under the scheme would be selected by the Central Government, in consultation with the State governments/UTs, on the basis of following criteria:

- a) District/referral hospitals of the districts where there is no medical college.
- b) District Hospitals/referral hospital with bed strength of 200 or more
- c) Preference would be given to the underserved areas.

2. **Eligibility to Start a Medical College**

- a) A State Govt./Union Territory;
- b) A University;
- c) An autonomous Body promoted by Central or State Government or under a Statute for the purpose of medical qualification;
- d) A society registered under the Societies Registration Act, 1860 for corresponding Acts in States; or
- e) A public Religious or Charitable Trust registered under the Trust act, 1882 or the WAKFS Act, 1954.
- f) Companies registered under The Company Act, 1956

¹¹Source: <https://main.mohfw.gov.in/sites/default/files/42758936271446789560.pdf>



3. Qualifying criteria i.e. conditions to be fulfilled for starting a medical college.

- i) Medical education must be one of the objectives of the applicant trust/registered society.
- ii) A suitable single plot of land measuring not less than 20 acres must be owned and possessed by the applicant or is possessed by the applicant by way of 99 years lease for the construction of the college.
- iii) The applicant must submit the Essentiality Certificate from the concerned State Govt. for establishment of the proposed medical college.
- iv) The Consent of Affiliation from the University concerned.
- v) The applicant owns and manages a hospital of not less than 300 beds with necessary infrastructure facilities capable of being developed into a teaching institution in the campus of the proposed medical college.
- vi) The applicant has not admitted students in the proposed medical college.
- vii) The applicant provides two performances Bank guarantee in favour of MCI for the prescribed sums varying according to the number of admissions, one for the establishment of the college and the other for the hospital. Government Medical Colleges are exempted from submitting performance Bank guarantees.
- ix) The college shall be set up only in the plot earmarked for that purpose.



Annexure -D-10.2.7

SPORTS INFRASTRUCTURE SCENARIO OF NCR**Table D-10.2.7.1: Type of sports in NCR**

Sub Region	Type of sports
NCT Delhi	Swimming, Basketball, Badminton, Hockey, Foot ball, Cricket, Athletics, Volley Ball, Netball, Tennis, Boxing, Judo/ Wrestling / Kabaddi , shooting, Archery (All most all kinds of sports facilities)
Haryana	Badminton, Boxing, Hockey, Gymnastics, Athletics, Cricket, Wrestling, Hockey, Volleyball, Cycling, Judo, Basketball, Archery, Football, Kho-Kho, Table Tennis, Handball, Wushu, Kabaddi
UP	Athletics, badminton, kho-kho, volleyball, wushu, cricket, judo, wrestling, taekwondo, swimming, hockey, Judo, Basketball, Wushu, Weightlifting, Kabaddi, Athletics, Volleyball, , Gymnastic, Boxing, Shooting, 10m air pistol shooting, Archery, Volleyball
Rajasthan	All Sports Athletics, Boxing, Badminton, Hockey, Swimming, Wrestling, etc.

Source: NCR Monitoring and Planning Cell, Govt. of NCT Delhi, Govt of Haryana, Govt of UP and Govt of Rajasthan



EDUCATION

1. EXISTING STATUS

1.1 Access to Elementary and Secondary Education- In the National Capital Region, it has been found that number of elementary schools per lakh population was 74.44 in 2016-17, **Table D-10.3.1** gives a snapshot of Elementary and Secondary schools in NCR.

Table D-10.3.1: Elementary Schools and Secondary Schools in NCR Region in 2016-17

District/State	No. of Elementary Schools (per Lakh Population)	No. of Secondary Schools (per Lakh Population)	No. of Elementary Schools (per Sq. Km.)	No. of Secondary Schools (per Sq. Km.)
Delhi	34.11	12.43	3.86	1.41
Haryana	86.28	31.72	0.59	0.22
Uttar Pradesh	79.62	9.27	1.08	0.13
Rajasthan	134.59	47.18	0.62	0.22
NCR	74.44	20.06	0.83	0.22

Source: UDISE 2016-17, NIEPA, New Delhi

1.2 Government and Private Schools - As far as elementary schools are concerned in 17 out of 23 NCR districts in three states, the government schools are more than the private schools. At secondary level, the percentage of government schools is relatively quiet less, showing the interest of the private sector in this sphere. A snapshot is given in (**Table D-10.3.2 at Annexure D-10.3**).

1.3 Enrolment in School Education - Enrolment at elementary level in the NCR is found to be the highest in Delhi where total children enrolled is 29,88,501 which is followed by Uttar Pradesh (2799184), Haryana (2549300) and Rajasthan (1098240).

Table D-10.3.2: Enrolment in Elementary and Secondary Schools in NCR Region in 2016-17

District/State	Elementary		Secondary	
	Total	Average	Total	Average
Delhi	29,88,501	3,32,055	12,32,736	1,36,970
Haryana	25,49,300	1,96,100	10,00,333	76,949
Uttar Pradesh	27,99,184	3,49,898	9,12,068	1,14,008
Rajasthan	10,98,240	5,49,120	3,98,580	1,99,290

Source: NIEPA, New Delhi

1.4 As far as enrolment at elementary level is concerned in 6 out of 9 districts of Delhi, enrolment in Government schools is more than 50 percent. Among the 13 NCR districts of Haryana in all but one district i.e. Mewat (79.7 percent), enrolment in government schools is less than 50 percent. However, in NCR districts of Uttar Pradesh barring Shamli with 43.9 %, not even one district has even 40 percent enrolment in Government schools at elementary level. In the two NCR districts of Rajasthan, enrolment at elementary level is less than 45 percent in government schools.

1.5 Enrolment at secondary level shows that in NCR out of 9 districts in Delhi enrolment in 7 districts is more than 50 percent in Government schools In rest of the NCR districts in Haryana, Uttar Pradesh and Rajasthan out of 23 districts except Mewat (67.6 percent) in Haryana enrolment at secondary level in all districts is less than 50 percent in the Government schools.



- 1.6 Higher Education in NCR Region:** - The Delhi/NCR region comprises of several multi-national companies owing to its close proximity to almost 6 northern states of India. Hence, the students can gain vital exposure from the regular collaborations that these companies have with various educational institutes in the vicinity. Out of 903 Universities in the country, around 25 per cent of Universities and out of 39,050 colleges, more than 28 per cent colleges are located in 4 NCR states. The spread of education facilities in NCR is provided.
- 1.7** Statistics reveal that Delhi/NCR region contributed to 7.5 percent of India's GDP during the last few years in a row. Paramount to achieving this feat has been the numerous educational institutions in the industrial corridor of the NCR region. **Table D-10.3.3** shows the number of technical, general colleges, their density and average enrolment per college NCR sub-region wise. It shows that there is enough scope for developing NCR region into a major global technological and educational centre in the country by expanding the access to professional and technical education. Apart from imparting the academic curriculum, instilling key skills such as personality development, communication and obtaining knowledge regarding the current trends are essential in modern education to produce employable graduates.

Table D-10.3.3: Higher Education Institutions in NCR States in 2017-18

State	University	Colleges	General Colleges	Govt. Colleges (%)	Pvt. Colleges (%)	Medical	Technical	Colleges Per Lakh Population	Average Enrolment Per College
Delhi	27	178	8	55.7	44.3	3	7	8	1531
Haryana	40	964	25	20.3	79.7	3	6	30	611
Uttar Pradesh	76	6922	44	12.4	87.6	2	10	28	816
Rajasthan	79	2957	48	19.7	80.3	8	6	33	526

Source: NIEPA, New Delhi



Annexure-D-10.3.1

DETAILS OF LITERACY AND SCHOOL INFRASTRUCTURE IN NCR DISTRICTS**1. Literacy rates**

- 1.1** New Delhi district of NCT of Delhi has the highest literacy (89.4 percent). There are 3 districts in the region where literacy rates are in the range of 60-70 percent and these districts are Karnal in Haryana, Muzaffarnagar in Uttar Pradesh and Bharatpur district in Rajasthan. There are 7 districts in the region where literacy rates are in the range of 70-75 percent and these districts are Palwal and Mahendergarh in Haryana, Baghpat, Bulandshahr, Hapur and Meerut in Uttar Pradesh and Alwar district in Rajasthan. Panipat in Haryana is the only district in NCR that has literacy rates between 75 and 80 percent. All the rest of the districts (including whole of NCT Delhi), have literacy rates above 80 percent.

2. Details of secondary/ Higher Secondary schools Schools in NCR Sub regions**2.1 Elementary & Secondary Schools in NCR**

These include 5,727 elementary schools and 2,087 secondary/Higher Secondary schools from 9 districts of Delhi, 14,150 elementary schools and 5,203 secondary/higher secondary Schools from districts of Haryana sub region, 17,039 elementary schools and 1,985 secondary/higher secondary schools from districts of Uttar Pradesh sub region and as many as 8,345 elementary schools and 2,925 secondary/higher secondary schools in Rajasthan sub region of NCR. It can be seen that average number of elementary schools in Delhi are about 636 per district while average number of secondary/higher secondary schools in Delhi are about 232 per district. In Haryana the average number of elementary and secondary/higher secondary schools per district are about 1,088 and 400 respectively. In Uttar Pradesh average number of elementary and secondary/higher secondary schools per district are about 2519 and 248 respectively. Rajasthan subregion having two but large district in NCR has 4,172 elementary and 1,462 secondary/higher secondary schools, per district.

3. Ownership of Elementary & Secondary School in NCR

- 3.1** As far as elementary schools are concerned in 17 out of 23 NCR districts in three states, the government schools are more than the private schools. These districts include 11 districts from Haryana (out of 13), 4 districts from Uttar Pradesh (out of 8) and both the districts from Rajasthan. In the whole NCR region are Mewat district (84.2 percent) in Haryana has the highest percentage of government elementary schools followed by Mahendergarh (71.7 percent). However, Faridabad district (30.3) again in Haryana has the lowest percentage of government elementary schools in the region.
- 3.2** At secondary level, the percentage of government schools is relatively quite less. Out of 23 districts in three states of NCR region in only Mewat district's percentage of government schools (secondary/higher secondary) is more than 50. In Uttar Pradesh not even one district (out of 8 in NCR) has even 15 percent government secondary/higher secondary schools. Baghpat district has highest percentage of government secondary/higher secondary school in Uttar Pradesh (12.9 percent) followed by Shamli district (12.5 percent). Gautam Budh Nagar district (3.3 percent) in Uttar Pradesh has the lowest percentage of government secondary/higher secondary schools in the NCR.
- 3.3** NCR Districts where government schools are more than the private schools include 11 districts from Haryana (out of 13), 4 districts from Uttar Pradesh (out of 8) and both the districts from Rajasthan. In the whole NCR region are Mewat district (84.2 percent) in Haryana has the highest percentage of government elementary schools followed by Mahendergarh (71.7 percent). However, Faridabad district (30.3) again in Haryana has the lowest percentage of government elementary schools in the region



Table D-10.3.1.1: District wise Population and Literacy Rates of NCR Region in 2011

District/ State	Area in (Sq. Km)	Population in 2011					Literacy Rate		
		Rural (Total)	Rural (%)	Urban (Total)	Urban (%)	Total (In 000's)	Male	Female	Total
Delhi									
East Delhi	63	3530	0.21	1705816	99.79	1709346	92.5	84.6	88.8
Central Delhi	21	0	0.00	582320	100.00	582320	87.6	82.6	85.3
New Delhi	35	0	0.00	142004	100.00	142004	93.0	84.8	89.4
North Delhi	61	17746	2.00	870232	98.00	887978	91.1	81.9	86.8
North- East Delhi	62	21527	0.96	2220097	99.04	2241624	88.4	76.5	82.8
North- West Delhi	443	213950	5.85	3442589	94.15	3656539	89.7	78.8	84.7
South Delhi	247	12193	0.45	2719736	99.55	2731929	87.0	92.2	81.0
South- West Delhi	421	143676	6.27	2149282	93.73	2292958	93.6	83.1	88.8
West Delhi	130	6420	0.25	2536823	99.75	2543243	87.1	91.2	82.5
Haryana									
Bhiwani	32.83	1313123	80.34	321322	19.66	1634445	88.34	73.67	81.48
Charkhi Dadri	1489.24	445939	88.78	56337	11.22	502276	90.33	76.2	83.67
Faridabad	741	370878	20.49	1438855	79.51	1809733	89.9	75.2	83.0
Jind	2702	1028569	77.1	305583	22.9	1334152	87.25	72.07	80.11
Gurgaon	1258	472179	31.18	1042253	68.82	1514432	90.3	77.6	84.4
Jhajjar	1834	715066	74.61	243339	25.39	958405	89.4	71.0	80.8
Karnal	2520	1050514	69.8	454810	30.2	1505324	74.73	81.82	66.82
Mahendragarh	1899	789233	85.6	132855	14.4	922088	82.71	90.65	73.94
Mewat	1507	965157	88.61	124106	11.39	1089263	37.6	73.0	56.1
Palwal	1359	806164	77.31	236544	22.69	1042708	82.6	56.4	70.3
Panipat	1268	650352	53.95	555085	46.05	1205437	85.5	68.2	77.5
Rewari	1594	666902	74.07	233430	25.93	900332	92.9	70.5	82.2
Rohtak	1745	615040	57.96	446164	42.04	1061204	88.4	71.2	80.4
Sonipat	2122	996637	68.73	453364	31.27	1450001	89.4	70.9	80.8
Uttar Pradesh									
Baghpat	1321	1028023	78.89	275025	21.11	1303048	84.2	61.2	73.5
Bulandshahr	4512	2631742	75.21	867429	24.79	3499171	82.5	56.6	70.2
Gautam Buddha Nagar	1282	673806	40.88	974309	59.12	1648115	90.2	72.8	82.2
Ghaziabad	1179	1519098	32.45	3162547	67.55	4681645	88.2	81.4	85.0
Hapur	660	1075228	80.35	262983	19.65	1338211	N.A	N.A	75.3
Meerut	2559	1684507	48.92	1759182	51.08	3443689	82.9	65.7	74.8
Muzaffarnagar	2991	2952200	71.25	1191312	28.75	4143512	71.0	77.8	63.5
Shamli	1167.58	926575	70.5	387075	29.5	1313650	82.0	78.4	58.7
Rajasthan									
Alwar	8380	3019728	82.19	654451	17.81	3674179	85.1	56.8	71.7
Bharatpur	5066	2053363	80.6	495099	19.4	2548462	79.0	88.1	68.8

Source: UDISE 2016-17, NIEPA, New Delhi



Table D-10.3.1.2: District wise Number of Educational Institutions per Sq. Km. and Per Lakh Population in NCR Region in 2016-17

District/ State	Area in (Sq. Km)	Population in 2011	Total Elementary Schools	Total Secondary/ Hr. Secondary Schools	No. of Elementary Schools		No. of Secondary/Hr. Secondary Schools	
					Per Sq. Km.	Per Lakh Population	Per Sq. Km.	Per Lakh Population
Delhi								
East Delhi	63	1709346	603	198	9.6	35.3	3.1	11.6
Central Delhi	21	582320	233	118	11.1	40	5.6	20.3
New Delhi	35	142004	95	66	2.7	66.9	1.9	46.5
North Delhi	61	887978	340	119	5.6	38.3	2	13.4
North- East Delhi	62	2241624	866	196	14	38.6	3.2	8.7
North- West Delhi	443	3656539	1183	443	2.7	32.4	1	12.1
South Delhi	247	2731929	848	282	3.4	31	1.1	10.3
South- West Delhi	421	2292958	741	333	1.8	32.3	0.8	14.5
West Delhi	130	2543243	818	332	6.3	32.2	2.6	13.1
Haryana								
Bhiwani	32.83	1634445	1665	660	50.7	101.9	20.1	40.4
Faridabad	741	1809733	1236	503	1.7	68.3	0.7	27.8
Jind	2702	1334152	1090	444	0.4	81.7	0.2	33.3
Gurgaon	1258	1514432	987	364	0.8	65.2	0.3	24
Jhajjar	1834	958405	898	402	0.5	93.7	0.2	41.9
Karnal	2520	1505324	1329	430	0.5	88.3	0.2	28.6
Mahendragarh	1899	922088	1047	352	0.6	113.5	0.2	38.2
Mewat	1507	1089263	990	156	0.7	90.9	0.1	14.3
Palwal	1359	1042708	1057	332	0.8	101.4	0.2	31.8
Panipat	1268	1205437	873	330	0.7	72.4	0.3	27.4
Rewari	1594	900332	936	328	0.6	104	0.2	36.4
Rohtak	1745	1061204	765	402	0.4	72.1	0.2	37.9
Sonipat	2122	1450001	1277	500	0.6	88.1	0.2	34.5
Uttar Pradesh								
Baghpat	1321	1303048	1172	163	0.9	89.9	0.1	12.5
Bulandshahr	4512	3499171	4044	385	0.9	115.6	0.1	11
Gautam B. Nagar	1282	1648115	1652	215	1.3	100.2	0.2	13
Ghaziabad	1179	4681645	1815	270	1.5	38.8	0.2	5.8
Hapur	660	1338211	1130	133	1.7	84.4	0.2	9.9
Meerut	2559	3443689	2871	454	1.1	83.4	0.2	13.2
Muzaffarnagar	2991	4143512	2889	269	1.0	69.7	0.1	6.5
Shamli	1167.58	1313650	1466	96	1.3	111.6	0.1	7.3
Rajasthan								
Alwar	8380	3674179	5140	1778	0.6	139.9	0.2	48.4
Bharatpur	5066	2548462	3205	1147	0.6	125.8	0.2	45.0

Source: UDISE 2016-17, NIEPA, New Delhi



Table D- 10.3.1.3: Elementary Schools and Secondary Schools by Management in NCR Sub-region in 2016-17 (percent)

District/State	Elementary		Secondary/H.Secondary	
	Govt.	Private	Govt.	Private
Delhi				
East Delhi	48.3	51.7	59.1	40.9
Central Delhi	50.6	49.4	32.2	67.8
NewDelhi	58.9	41.1	54.5	45.5
NorthDelhi	53.3	46.7	51.3	48.7
North-EastDelhi	36.9	63.1	62.7	37.3
North-WestDelhi	57.1	42.9	54.0	46.0
SouthDelhi	51.7	48.3	61.3	38.3
South-WestDelhi	45.3	54.7	45.3	54.7
WestDelhi	45.5	54.5	43.4	56.6
Haryana				
Faridabad	30.3	69.7	18.6	81.4
Gurgaon	58.5	41.5	33.3	66.7
Jhajjar	58.9	41.1	44.0	56.0
Mewat	84.2	15.8	61.6	38.4
Palwal	57.7	42.3	33.4	67.6
Panipat	48.6	51.4	36.9	63.1
Rewari	70.1	29.9	46.6	53.4
Rohtak	53.9	46.1	40.8	59.2
Sonipat	57.0	43.0	42.6	57.4
Bhiwani(incl.Charkhi Dadri)	68	32	47	53
Jind	68	32	48	52
Karnal	59	41	40	60
Mahendragarh	72	28	42	58
UttarPradesh				
Baghpat	59	41	12.9	87.1
Bulandshahr	60	40	10.9	89.1
GautamBuddhaNagar	41.9	58.1	3.3	96.7
Ghaziabad	35.5	64.5	5.5	99.5
Hapur	60.1	39.9	5.3	94.7
Meerut	48.5	51.5	9.9	90.1
Muzaffarnagar	44	56	11	89
Shamli	52	48	12	88
Rajasthan				
Alwar	56	44	42	58
Bharatpur	55	45	46	54

Source: UDISE2016-17, NIEPA, NewDelhi



EDTECH-TECHNOLOGY IN EDUCATION

1. **EdTech**¹² (a portmanteau of “education” and “technology”) refers to hardware and software designed to enhance teacher-led learning in classrooms and improve students’ education outcomes.
2. Edtech is the practice of introducing IT tools into the classroom to create a more engaging, inclusive and individualized learning experience.
3. Today’s classrooms have moved beyond the clunky desktop computers that were once the norm and are now tech-infused with tablets, interactive online courses and even robots that can take notes and record lectures for students who are ill.
4. This influx of edtech tools are changing classrooms in a variety of ways: edtech robots are making it easy for students to stay engaged through fun forms of learning; IoT devices are being hailed for their ability to create digital classrooms for students, whether they’re physically in school, on the bus or at home; even machine learning and blockchain tools are assisting teachers with grading tests and holding students accountable for homework
5. The potential for scaleable individualized learning has played an important role in edtech’s ascendance. The way we learn, how we interact with classmates and teachers, and our overall enthusiasm for the same subjects is not a one-size-fits-all situation. Everyone learns at their own pace and in their own style. Edtech tools make it easier for teachers to create individualized lesson plans and learning experiences that foster a sense of inclusivity and boost the learning capabilities of all students, no matter their age or learning abilities.
6. And it looks like technology in the classroom is here to stay — 92% of teachers believe tech is going to have a major impact on the way they educate in the near future. For that reason, it’s vital to understand the benefits edtech brings in the form of increased communication, collaboration and overall quality of education
7. A successful **EdTech implementation** is the result of a carefully planned approach that comprises of developing a tech integration vision, a tech integration plan and roadmap and supporting the integration plan

¹² <https://builtin.com/edtech>



Annexure-D-10.4

10.4 SOCIAL CARE INFRASTRUCTURE

1. EXISTING STATUS

- 1.1 The social support infrastructure is underprovided in NCR. As per available data, there are a only a total of 61 Hostels with a capacity of 4,589 persons, including Working Men Hostels (7 in no. and 18% of the total capacity) and Working Women hostels (19 in no. and 35% of total capacity), Youth Hostels (11 in no. and 2% of total capacity) and Other Hostels (24 in no. and 46% of total capacity).
- 1.2 About 34 old age homes are there in NCR, with a total capacity of 2039; U.P. accounts for 46%, followed by Haryana with 42% and NCT of Delhi accounts for a meager 11%. Considering the elderly population of NCR to be 43.31 lakhs, the social support infrastructure is severely underprovided; less than 0.05%. Provision of the infrastructure i.e. old age homes vis-a vis the elderly population show that in NCT of Delhi it is 0.02%, in Haryana, it is 0.05% and in U.P., it is 0.07%. Social Support infrastructure scenario of NCR is provided at **Table D-10.4.1.1** Spread of Old Age homes across NCR is presented at **Table D-10.4.1.2**.
- 1.3 Other important categories that need adequate social support for leading productive and dignified lives include the victims of alcoholism and substance abuse & their families, beggars and transgender, etc. which have to be considered in NCR.

2. Key issues and challenges related to social support system are as under:

- 2.1 Almost 16 lakh people in Delhi are above the age of 60 years and city has lot of migrant population from other states coming for their livelihood, career, health and other facilities. Similar situation is possible in most urban areas of NCR. Population ageing is both an opportunity and a challenge, therefore, concerted multi-stakeholder & multi-sectoral action is needed.
- 2.2 As suggested by WHO, the future demands Age-friendly cities through anticipating and responding flexibly to ageing-related needs and preferences, respecting their decisions and lifestyle choices; and promoting their inclusion in and contribution to all areas of community life. Cities/ habitations are required to be age friendly cities, affordable, accessible, safe, participatory/ inclusive and protective to those who are most vulnerable.
- 2.3 With more working women and rise in nuclear families, adequate child care centers, crèches in urban centers are the need of immediate future.
- 2.4 Focus should be on supporting the unemployed with employment opportunities rather than allowances.



Annexure D-10.4.1

SOCIAL SUPPORT INFRASTRUCTURE SCENARIO OF NCR**1. Hostel Facilities****Table D-10.4.1.1: Sub-region wise hostel facilities in NCR, 2019**

Sub Region	Working Men Hostels		Working Women Hostels		Youth Hostels		Other Hostels	
	Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity
NCT Delhi	NA	NA	20	NA	3	NA	7	1120
*Haryana	1	50	12	522	10	110	1	82
UP	6	796	6	930	1	0	16	931
Rajasthan	NA	NA	NA	NA	NA	NA	NA	NA
NCR	7	846	19	1500	11	110	24	2133

Source: NCR Monitoring and Planning Cells, Govt of NCT Delhi, Govt of Haryana, Govt of Uttar Pradesh

*<https://www.yhaindia.org/licensee-youth-hostels.html> and for working women hostels- Women and Child Development Department, Government of Haryana
NA-Data not available

2. Old Age Homes**Table D-10.4.1.2: Sub-region wise old age homes (both public & private) facility in NCR, 2019**

Sub Region	Total no. of old age homes	Capacity of old age homes	Population above 60 years of age (2011)
		Number	Number
NCT Delhi	4	228	1147445
Haryana	18	856	1432707
UP	6	955	1287041
Rajasthan	6	NA	464311
NCR	34	2039	4331504

Source: NCR Monitoring and Planning Cell, Govt of NCT Delhi, Govt of Haryana, Govt of Uttar Pradesh, *Department of Social Justice and Empowerment, Government of Haryana, India and Census of India 2011 for Population above 60 years of age

Note: HSR: Excluding data for Ch Dadri, Mahendragarh, Mewat, Palwal and Panipat and Sonapat districts

UPSR: Excluding data for Ghaziabad, Bulandshahr, Hapur and Meerut districts

NA-Data not available



Annexure D-10.4.2

MAJOR INITIATIVES OF CENTRAL GOVT. & NCR PARTICIPATING STATE GOVERNMENTS REGARDING SOCIAL SUPPORT SYSTEMS

A. Govt. of India

I. India is a signatory to the following three UN Conventions:

- a) Single Convention on Narcotic Drugs, 1961, as amended by the Protocol of 1972 on Narcotic Drugs,
- b) Convention on Psychotropic Substances, 1971 and
- c) Convention on Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988.

II. Relevant Acts:

- a) **Narcotics Drugs and Psychotropic Substances (NDPS) Act, 1985** - prohibits- Cultivation of coca, opium or cannabis plants without license; Manufacture of narcotic drugs and psychotropic substances without license and for uses other than medical or scientific purposes and Section 71 of the Act empowers the Government to establish centers for identification, treatment, management, education, after-care, rehabilitation etc. of addicts.
- b) **NDPS Policy, 2012** – Defines the role of various Ministries/Department along with activities

III. Drug Control – Agencies involved

- Supply Reduction-Ministry of Home Affairs & Department of Revenue
- Demand Reduction-Ministry of Social Justice & Empowerment
- Harm Reduction-Ministry of Health & Family Welfare

IV. Magnitude of Substance use in India

- National Level Survey conducted by the Ministry during 2018 for generating estimates on Extent and Pattern of Substance Use in India
- Survey was conducted in 186 Districts
- Data was collected from individuals in 10-75 years of age group
- About 5.4 lakhs individuals were interviewed
- Report released on 18-02-2019
- Lead Agency – (i) National Drug Dependence Treatment Centre, (AIIMS, New Delhi) (ii) National Institute of Social Defense

○ Main Findings:

- Alcohol use: 14.6% (16 crore users)
- Cannabis use: 2.8% (3.1 crore users)
- Opium use: 2.1% (2.26 crore users)
- Sedatives use: 1.08% (1.18 crore users)
- Inhalants use: 0.7% (77 Lakhs users)

○ Extent, Trend and Pattern of Drug Abuse

- Alcohol use: 14.6% (16 crore users): Highest using States: Chhattisgarh, Tripura, Punjab, Arunachal Pradesh and Goa
- Cannabis use: 2.8% (3.1 crore users): Highest using States: **Uttar Pradesh**, Punjab, Sikkim, Chhattisgarh and **Delhi**.



- **Opioid use:** 2.1 % (2.26 crore users): Highest using States: Sikkim, Arunachal Pradesh, Nagaland, Manipur and Mizoram.
- **Sedatives use:** 1.08 % (1.18 crore users): Highest using States: Sikkim, Nagaland, Manipur and Mizoram. States housing large population of sedative users: **UP**, Maharashtra, Punjab, Andhra Pradesh and Gujarat

V. Interventions by MSJE

- Supports about 488 Integrated Rehabilitation Centre for Addicts (IRCAs) in the country.
- Media campaign through electronic, print and social media-radio programmes, outdoor publicity etc.
- **Operates a National Toll free Help line no. 1800-11-0031** to help victims of drug abuse and their families.
- National Institute of Social Defence (NISD)- An autonomous body for training, awareness generation and documentation in the field of drug demand reduction.
- 12 Regional Resource and Training Centres (RRTCs)- Field training units and provide technical support to NGOs.

VI. Scheme -Prevention of Alcoholism & Substance (Drugs) Abuse

- Implemented since 1985-86
- Financial assistance is provided upto 95 % for Integrated Rehabilitation Centre for Addicts (IRCAs)
- Presently supporting approximately 485 IRCAs
- Approximately 1 lakh addicts treated per year.
- Eligible Organizations/Institutions:
 - District Hospitals, Railway Hospitals, Prisons, Juvenile Homes
 - Registered Societies formed by the State Governments
 - Panchayati Raj Institutions (PRIs), Urban Local Bodies (ULBs), organizations/institutions fully funded or managed by State/ Central Government or a local body
 - A Society registered under the Societies Registration Act, 1860 (XXI of 1860) or any relevant Act of the State Governments/ Union Territory Administrations
 - A Public Trust registered under any law for the time being in force
 - A Company established under Section 25 of the Companies Act, 1956
- **The Grant in aid is provided for running :**
 - 15 bedded IRCA- upto Rs. 25,81,800/-
 - 30 bedded IRCA- upto Rs 36,56,400/ -
 - 50 bedded IRCA- upto Rs 49,02,000/-

VII. On-line submission and processing of applications of NGOs from 2014-15. Total districts covered are 306

VIII. National Action Plan For Drug Demand Reduction (NAPDDR)- A National Action Plan for Drug Demand Reduction (2018-2025) has been prepared by the Ministry along with the implementation framework with the following objective-

- To create awareness about ill effects of drugs abuse and reduce stigmatization of and discrimination against dependents on drugs in order to integrate them back into the society
- Develop human resources and build capacity for working towards these objectives.
- To facilitate research, training, documentation, innovation and collection of relevant information.
- Alleviate the consequences of drug dependence amongst individuals, family and society at large.

IX. Components Admissible for Financial Assistance under NAPDDR

- Preventive Education and Awareness Generation



- Capacity Building
- Treatment and Rehabilitation
- Setting quality standards
- Focused Intervention in vulnerable areas.
- Skill development, vocational training and livelihood support of ex-drug addicts.
- Survey, Studies, Evaluation, research and Innovation on the subjects covered under the Scheme.
- Programs for Drug Demand Reduction by States/Uts.
- Program Management.
- Any other activity or item which will augment/strengthen the implementation of NAPDDR.

X. Focussed Intervention in Vulnerable Areas

- 131 districts have been identified in the country based on feedback from stakeholders.
- Following two interventions would be carried out in the identified districts:
 - Community based Peer led Intervention (PLI) for Early Drug Use Prevention among Adolescents
 - Youth would be trained as Peer Educators to lead peer led community intervention and implement early prevention education especially for vulnerable adolescents and youth in the community. Referral and linkage to counselling, treatment and rehabilitation services for drug dependents identified in the community would also be provided.

XI. Components Admissible for Financial Assistance under NAPDDR Outreach and Drop in Centres

- Outreach activities would be conducted in the community for prevention of drug abuse with a special focus on youth who are dependent on drugs.
- ODICs would provide safe and secure drop-in space for drug users in the community.
- Centres shall have the provision of screening, assessment and counselling
- Provision of consultation with doctor for referral and linkage with treatment facility

B. NCR participating State governments

1. NCT Delhi - Initiatives taken by Department of Social Welfare, Women & Child Development, GNCT Delhi

i) Financial Assistance for the needy

- a) Delhi Pension Scheme to Women in Distress (Widows, Divorced, Separated, Destitute, Abandoned Women)
 - Target Group - Women in Distress (Widows, Divorced, Separated, Destitute, Abandoned Women) from the age group of 18 years to lifelong.
 - From September, 2016 onwards the payment through PFMS portal has also been started.
 - The scheme has been launched online on e-district portal from 12/12/2018.
 - An amount of Rs.2500 per month is remitted to the bank accounts of beneficiary through Aadhar based payment (PFMS-Portal /DBT).
 - Total numbers of beneficiaries under Delhi Pension to Women in Distress are 2.48 Lakhs till December 2019.
 - Budget Allocated for the Financial Year 2019-20 – Rs.745 Crores
- b) Financial Assistance to “Poor Widows for marriage of their Daughters and Orphan Girls”
 - To provide Financial Assistance to the poor widows for performing the marriage of their daughter (upto two daughters only).
 - To provide Financial Assistance to the Guardian including Homes/Institutions or foster parents of an orphan for her marriage.



- This is one time grant of Rs. 30,000/- through ECS.
- c) Old Age Assistance (Old Age Pension)
 - Financial Assistance of Rs.2000/- per month is provided to persons of 60-69 years .
 - Rs.2500/- to persons belonging to SC/ST/Minority category in the age group of 60-69 years.
 - Rs.2500/- per month to persons 70 years and above (all category).
 - Applicants have to be resident of Delhi for at least 5 years, having income below Rs.1 Lakh per annum (both husband and wife included).
 - Old Age Assistance Scheme has got 4.65 Lakhs beneficiaries with allocated budget of Rs1244 crore
- d) **Financial Assistance to Persons with Special Needs (Disability Pension) @ Rs. 2500/- per month provided to**
 - Beneficiaries of all ages, if disability is 40% and above and
 - Resident of Delhi for at least 5 years, having family income below Rs.1 Lakh per annum.
 - 21 disability categories are covered as identified in Rights of Persons with Disabilities Act 2016
 - Financial Assistance to Persons with Special Needs has benefited 93475 with allocated fund of Rs. 255 cr.
- e) Delhi Family Benefit Scheme (DFBS)
 - One time assistance of Rs.20,000/- is provided in the event of death of primary breadwinner.
 - Age of breadwinner should be between 18 to 60 years at the time of death.
 - Applicant should be resident of Delhi for minimum 05 years having family income below Rs.1 Lakh per annum.
 - Delhi Family Benefit Scheme has 5686 beneficiaries and 13.7cr
- f) Delhi Ladli Scheme, 2008
 - Launched on 01.01.2008 for empowerment of girl children.
 - Financial assistance in the form of term deposits of Rs.11,000/- if born in hospital or Rs.10,000/- if born at home at the time of registration and Rs.5,000/- each, after reaching five milestones i.e. Class I, VI, IX, XI & XII.
 - Having family income below Rs.1 lakh per annum from all sources.
 - Residence in Delhi for last three years.
 - No. of Beneficiaries since inception of the scheme i.e. 2008 ~ 10.17 Lakhs (approx.)
- g) Pradhan Mantri Matru Vandana Yojana (PMMVY)
 - Providing partial compensation for the wage loss in terms of cash incentives so that the woman can take adequate rest before and after delivery of the first living child.
 - The cash incentive provided would lead to improved health seeking behaviour amongst the Pregnant Women and Lactating Mothers (PW&LM).

ii) Target beneficiaries:

- All first time pregnant Women and lactating mothers, excluding PW & LM who are in regular employment with the Central Government or the State Governments or PSUs or those who are in receipt of similar benefits under any law for the time being in force.

Benefits under PMMVY:

- Cash incentives in three instalments through PMMVY CAS Portal link with PFMS.
- First instalment of Rs.1000/- at the time registration at AWC.



- Second instalment of Rs.2000/- after six month of pregnancy.
- Third instalment of Rs.2000/- after child birth registration and immunization.

Current Status of the scheme :

- No. of beneficiaries covered since 1/1/2017 – 136640 till 09/01/2020.

iii) Institutions under Section 41 of Juvenile Justice Act, 2015

- 23 Government run Child Care Institutions (notified)
- 02 After Care Homes
- 09 NGO run Open Shelters
- 82 NGO run Child Care Institutions
- 11 Specialized Adoption Agencies (including one Govt. run Children Home notified recently as Adoption Agency)

iv) Statutory Bodies under Juvenile Justice Act, 2015

- 06 Juvenile Justice Boards
- 10 Child Welfare Committees.



Annexure-D-11.1

11. SMART AND DIGITAL NCR

Digital Infrastructure in NCR

1. The role of technology was acknowledged in the Regional Plan-2021 (RP-2021) however, it was limited up to Telecommunication sector, recognizing that provision of effective and efficient Telecom facilities across NCR had immense significance to promote growth and balanced development in the entire region. Policies and proposals of Telecommunications Chapter of the RP-2021 and its implementation was reviewed by NCRPB in conjunction with an Expert Study Group, constituted under TRAI with members from Department of Telecommunications (DoT), Govt. of India, Ministry of Electronics & Information Technology (MeitY) and National Institute of Electronics & Information Technologies (NIELIT).
2. Review Report emphasised that in order to achieve three prolonged missions i.e. Connect India, Propel India and Secure India, under the Government of India 'Nation Digital Communication policy 2018'¹ deployment of vast amount of digital infrastructure is required in urban as well as rural areas of NCR and in order to meet different schemes, initiatives and ambitious projects of the Government of India such as Digital India, Smart Cities and BharatNet, it is essential that the infrastructure being developed as a part of the Regional Plan should be digitally ready.

Table D-11.1.1: Details of telecommunication infrastructure (Wireline Connections i.e., Dedicated Exchange Line (DELs), Broadband, Public Call office (PCO) and village Public Telephone (VPT) connection in NCR

State/ District		No. of Wireline Connections (DELs)	No. of Wireline Broadband Connections	No. of Wireless Broadband Connections	No. of PCOs	No. of VPTs
Union Territory of Delhi	Whole NCT of Delhi	19,49,012	12,25,950	1,90,90,492	47,389	0
Haryana	Bhiwani	2,388	2,914	7,27,648	4	19
	Faridabad	46,832	55,717	19,09,426	266	21
	Gurgaon	3,15,205	1,52,997	27,98,375	77	5
	Jhajjar	611	1,236	5,06,144	0	16
	Jind	7,555	4,012	5,85,808	66	124
	Karnal	11,109	11,152	8,24,520	14	20
	Mahendragarh	7,364	2,897	3,93,786	108	25
	Mewat	1,198	712	1,96,472	6	0
	Palwal	4,262	1,938	2,97,285	75	13
	Panipat	7,507	11,961	8,48,104	20	2
	Rewari	11,994	4,762	2,81,173	97	20
	Rohtak	9,374	5,128	6,46,839	0	28
	Sonepat	11,938	5,228	8,61,591	195	172
	Total	4,37,337	2,60,654	1,08,77,171	928	465
Rajasthan	Alwar	15,869	6,129	17,19,773	93	36
	Bharatpur	4,490	1,104	8,34,329	0	0
	Total	20,359	7,233	25,54,102	93	36

¹ http://dot.gov.in/sites/default/files/Final%20NDCCP-2018_0.pdf



State/ District		No. of Wireline Connections (DEs)	No. of Wireline Broadband Connections	No. of Wireless Broadband Connections	No. of PCOs	No. of VPTs
Uttar Pradesh	Baghpat	2,251	534	3,56,818	87	25
	Bulandshahr	3,234	1,278	8,60,770	33	448
	Gautam Buddha Nagar	63,219	6,241	18,25,853	122	53
	Ghaziabad	50,953	79,961	29,31,994	557	48
	Hapur	3,531	1,499	3,38,878	138	28
	Meerut	26,292	17,688	15,53,543	207	97
	Muzaffarnagar	7,230	3,304	10,89,331	36	83
	Shamli	2,468	865	2,32,996	15	71
	Total	1,59,178	1,11,370	91,90,183	1,195	853

Source: TRAI, 2019

Table D-11.1.2: Number of BTs and their connectivity Status over Optical Fiber across NCR-2019

State/ District		No of BTSs	No of BTS connected over Optical Fiber
Union Territory of Delhi	National Capital Territory of Delhi	12,821	4,946
Haryana	Bhiwani	1,090	273
	Faridabad	1,401	661
	Gurgaon	2,864	968
	Jhajjar	907	207
	Jind	1,072	362
	Karnal	1,155	284
	Mahendragarh	779	204
	Mewat	569	134
	Palwal	717	196
	Panipat	1,106	320
	Rewari	947	267
	Rohtak	993	286
	Sonepat	1,374	377
	Total	14,974	4,539
Rajasthan	Alwar	2,253	680
	Bharatpur	1,191	289
	Total	3,444	969
Uttar Pradesh	Baghpat	675	166
	Bulandshahr	1,655	357
	Gautam Buddha Nagar	2,112	854
	Ghaziabad	2,234	920
	Harpur	641	145
	Meerut	2,117	634
	Muzaffarnagar	1,391	308
	Shamli	475	120
	Total	11,300	3,504

Source: TRAI, 2019



Table D-11.1.3: Status of BHQ connectivity with Fiber Cables across NCR, 2019

State/ District		No of Block HQs	No. of BHQs connected with Fiber							No. of BHQs connected with Fiber (in %)						
			BSNL	Bharti Airtel	Idea	Rcom	RJio	TATA	Voda-fone	BSNL	Bharti Airtel	Idea	Rcom	RJio	TATA	Voda-fone
Union Territory of Delhi	NCT of Delhi	Not Applicable								Not Applicable						
Haryana	Bhiwani	7	7	7	7	5	6	0	6	100%	100%	100%	71%	86%	0%	86%
	Faridabad	3	2	3	0	3	2	1	0	67%	100%	0%	100%	67%	33%	0%
	Gurgaon	4	4	4	3	4	4	1	2	100%	100%	75%	100%	100%	25%	50%
	Jhajjar	6	5	6	3	3	4	0	2	83%	100%	50%	50%	67%	0%	33%
	Jind	8	7	7	4	4	7	0	5	88%	88%	50%	50%	88%	0%	63%
	Karnal	8	6	7	5	5	6	1	5	75%	88%	63%	63%	75%	13%	63%
	Mahendregarh	8	6	8	4	2	6	0	4	75%	100%	50%	25%	75%	0%	50%
	Mewat	7	5	7	5	3	5	0	6	71%	100%	71%	43%	71%	0%	86%
	Palwal	6	5	6	2	1	5	0	4	83%	100%	33%	17%	83%	0%	67%
	Panipat	6	5	5	3	3	5	0	2	83%	83%	50%	50%	83%	0%	33%
	Rewari	6	5	5	2	3	3	0	3	83%	83%	33%	50%	50%	0%	50%
	Rohtak	5	5	5	5	2	5	1	3	100%	100%	100%	40%	100%	20%	60%
	Sonepat	8	8	8	5	4	6	0	6	100%	100%	63%	50%	75%	0%	75%
Haryana	Total	82	70	78	48	42	64	4	48	85%	95%	59%	51%	78%	5%	59%
Rajasthan	Alwar	14	13	12	6	7	13	1	4	93%	86%	43%	50%	93%	7%	29%
	Bharatpur	10	9	9	5	4	8	0	5	90%	90%	50%	40%	80%	0%	50%
Rajasthan	Total	24	22	21	11	11	21	1	9	92%	88%	46%	46%	88%	4%	38%
Uttar Pradesh	Baghpat	6	0	5	3	3	6	0	4	0%	83%	50%	50%	100%	0%	67%
	Bulandshahr	16	14	12	7	7	15	0	7	88%	75%	44%	44%	94%	0%	44%
	Gautam Buddha Nagar	4	4	4	1	3	4	1	2	100%	100%	25%	75%	100%	25%	50%
	Ghaziabad	4	4	4	1	4	3	0	1	100%	100%	25%	100%	75%	0%	25%
	Harpur	4	1	3	3	1	4	0	1	25%	75%	75%	25%	100%	0%	25%
	Meerut	12	3	12	4	3	12	0	5	25%	100%	33%	25%	100%	0%	42%
	Muzaffarnagar	9	8	9	3	5	9	0	4	89%	100%	33%	56%	100%	0%	44%
	Shamli	5	2	5	4	1	5	0	3	40%	100%	80%	20%	100%	0%	60%
Uttar Pradesh	Total	60	36	54	26	27	58	1	27	60%	90%	43%	45%	97%	2%	45%

Source: TRAI, 2019



Table D-11.1.4: Functional CSCs in NCR as on 31st March 21

State/UT	District Name	Total CSC in NCR	Rural
Delhi	Central, East, New Delhi, North, North East, North West, South, South West, West, South East, Shahdara	2787	0
Haryana	Bhiwani, Faridabad, Gurugram, Jhajjar, Jind, Karnal, Mahendragarh, Panipat, Rewari, Rohtak, Sonapat, Nuh, Palwal	10418	7070
Uttar Pradesh	Baghpat, Bulandshahr, Gautam Buddha Nagar, Ghaziabad, Meerut, Muzaffarnagar, Shamli, Hapur	5692	3414
Rajasthan	Alwar, Bharatpur	1113	841

Source: MeITy April 2021

Table D-11.1.5: Services Being offered on “Digital Seva Portal” under Common Service Centres (CSC) scheme

S. No.	Contents	
1	Aadhaar Services	Generation of Aadhaar, E-KYC & Authentication, Aadhaar Printing
2	Educational Services	Digital Literacy, Tele-Legal Consultation Services, Tele-Centre Entrepreneurship, E-Courts Services, Other Educational Services
3	Skill Development	Schemes and Courses, Job Portals
4	State G2C Services	E-District Services, PDS Services, Labour Registration Services, E-Stamp, E-Vahan – Sarathi Transport Services, Himachal Swasthya Bima Yojana (HIMCARE), Other State G2C Services
5	Central G2C Services	Election Commission Services, Passport Application, PAN Application, Swachh Bharat Abhiyan, FSSAI Registration/Licence, Pradhan Mantri Fasal Bima Yojana (PMFBY), Jeevan Pramaan, Ayushman Bharat Yojana, Pradhan Mantri Shram Yogi Maan-dhan Pension Yojana, Pradhan Mantri Kisan Maandhan Yojana (PM-KMY), PM Merchant Pension Scheme for Traders (PM-Merchant), Pradhan Mantri Kisan Samman Nidhi Yojana (PM-KSNT), Pradhan Mantri Kisan Credit Card (KCC) Yojana, Pradhan Mantri Street Vendor Atmanirbhar Nidhi (PM-SVAN), Udyam Jyoti Parichay
6	Financial Inclusion Services	Financial Inclusion – Banking Services, Banking Services (HDFC), Banking Services (ICICI), DigiPay (AEPS), Insurance Services, NPS & APY, Fastag Services. Diginame
7	Tours & Travels	IRCTC Services, Other Services
8	Utility Bill Payment Services	Utility Bill Payment – Bharat Bill Payment System (BBPS) Utility Services – Electricity Bill Payment, Water Bill Payment, LPG Booking
9	Healthcare Services	Human, Stree Swabhimani
10	Other B2C / B2B Services	Grammen E-Store Other Services – Products Distribution, Agriculture Services, Mobile/DTH Recharge, IT Return Filing, LED Micro Manufacturing Unit

Source: MeITy April 2021

Table D-11.1.6: Status of implementation of Indian Telegraph Right of Way (RoW) Rules in NCR States

Clauses of RoW 2016 Policy	NCT Delhi	Haryana	Rajasthan	UP
Whether State level Policy issued after issue of RoW Rules 2016	No	Yes	Yes	Yes
One time Fees @ Rs 10,000 for Mobile Towers & Rs 1,000 / km for OFC	No	No	Yes	Yes
Single Window Clearance	No	Yes	Yes	Yes
Online Application Process	No	Yes	Yes	Yes
Timeline for Clearance - 60 days / Deemed approval	Yes, but as per old policy	Yes (45 days deemed approval)	yes	Yes (45 days deemed approval)

Source: RP-2021 Review Report 2019 on Telecommunication.



E-GOVERNANCE & E-SERVICES IN NCR STATES

I. Rajasthan E-Governance core components

- a) IT Infrastructure: Core components like RSDC, RajNet, RajMegh etc. to host & disseminate IT enabled services
- b) Common Platforms: IT platforms like eSign, Sewa Dwaar, Rajdharaa etc. to enable application development
- c) Common Software: Ready to use applications like eProcurement, RAAS, RPP, SSO etc. for faster service delivery
- d) Public Interface for Service delivery: G2C Applications like SWCS, ePDS, eMitra etc. for effective delivery of citizen services
- e) Office Automation: G2G applications like Raj-Kaj, RajERP, FMDSS etc. for efficient resource utilization
- f) Startup Ecosystem: Facilities like iStart and Rajasthan stack to foster startup culture in the State
- g) Jan Soochna Portal
 - o RajComp Info Services Ltd. (RISL) becomes CA (Certification Authority) making Rajasthan First State in India to provide SSL and e-Sign Services to other States and the public by its own.

II. E-Services in NCT Delhi

Currently, Delhi has **E-District portal with 126 services**. Delhi has also initiated **door to door series. 1067** is the number for the end user. Delhi also has E-SLA (service level agreement) so that delivery is given on time; Delhi Govt. is dealing with 44 departments. Stakeholders of NCR should be much more than that. Also, Haryana has launched 600 services. All NCR sub-regions should develop a common platform common platform which will be the key driver and through this common platform sharing of data will be an important factor.

- i) **HIMMAT APP** - Himmat is an initiative by Delhi police especially for women. Himmat is an emergency service, comprised of an android emergency application, which can send a distress call or emergency message to Delhi Police officials and specified contact or group in an emergency situation faced by a woman. The Police personnel will get these SOS alerts and locations on a portal and as a sms on their mobile phones as well.²
- ii) **TATPAR Delhi Police**- Flagship Apps and services with following key features:
 - a) One click navigation to the nearest jurisdictional Police Station
 - b) One click navigation to the nearest jurisdictional Traffic pit(where vehicles are parked after being towed)
 - c) App for filing of e-FIRs for theft of property and motor vehicles
 - d) SOS – Emergency service. Receive immediate support from Delhi Police
 - e) Senior Citizen app registration and its services
 - f) Traffic app Services, Advisories and real time alerts
 - g) Special app with services for Women and child safety

² <http://54.169.6.175/#>



III. E-Services in Uttar Pradesh

- 1) Online Delivery of Services: e-District is the mission mode project to ensure the delivery of high volume citizen centric services using multiple delivery channels such as Directly through internet, Common Service Centers (CSC) mobile app etc. in efficient & transparent way.
- 2) UP was the first State in country to successfully rollout e-District scheme in 6 pilot districts (including two NCR districts - Gautam Budh Nagar, Ghaziabad, Sultanpur, Sitapur, Gorakhpur and Rae Bareilly) of UP. Later UP becomes first State in country to successfully rollout e-District scheme in all the 75 Districts of the State.
- 3) Presently 226 high volume citizen centric services of 31 state departments are being provided.
- 4) Looking at the overwhelming response of the citizens, GoUP is in the process to increase more citizen centric services under this scheme.
- 5) More than about 17.11 crores citizens have been benefited.
- 6) eSathi- as a online citizen centric services portal has been created to enable a single platform for various Government to citizen services.
- 7) Services Delivered through e-District Portal Uttar Pradesh is one of the priority. List of citizen centric services, being offered are provided on this link: <http://upite.gov.in/StaticPages/OnlineServices.aspx>

IV. E-Services in Haryana

- 1) Measures Taken by Department of Electronics and communication, Govt. of Haryana for New Technology Hub in Gurugram:
 - a) HARTRON Multi Skill Development Centre (HMSDC) was established with 35000 Sq. Ft to boost Startup Ecosystem
 - b) 3 Incubators “NASSCOM 10K Startup Warehouse”, “IAMAI-GoH Mobile 10X Hub” and “Center of Excellence for IOT”
 - c) 40+ Startups incubated
 - d) United Nations Technology Innovation Lab (UNTIL) is ready to Kick-Off with emphasis on Women Empowerment.
 - e) HARTRON’s Multi-skill Development Centre facilities can be extended
 - f) Future Technologies adoption through Technology Hub Creation can be done
 - g) Measures Taken by Department for E-Waste Disposal management Centre of Excellence in Gurugram and Creating CoE for e-Waste Management
 - h) Current status: There is no CoE to create physical infrastructure for :-
 - Research Activities
 - Innovations
 - Technology Specializations
 - Creating re-usable components
 - Develop skilled resources for e-waste management



2) Brief of E-Services in Haryana is as follow:

1. **CM Window** (<http://cmharyanacell.nic.in/>): CM Window is the public grievance portal for registering the grievance by any citizen of Haryana.
2. **ANTYODAYA-SARAL Portal** ([http://saralharyana.gov.in /](http://saralharyana.gov.in/)) : Aligning with Digital India's vision of faceless, paperless and cashless service/scheme delivery model, Antyodaya-SARAL aims to transform citizen service delivery in Haryana through complete digitization of over 380+ services. The vision for Antyodaya-SARAL is a unified platform to deliver and track Government-to-Citizen (G2C) services/schemes across the state.
3. **Haryana e-Seva Scheme for Common Service Centres/ Atal Seva Centre:** The Common Services Centers (CSC), also called as Atal Seva Kendras in Haryana have been established in most of Gram Panchayats with the services i.e. G2C, Business to Citizen, Financial Inclusion, Education, Agriculture, Health Services, Digitize India, Digi Pay.
4. **e-Bhoomi** (<https://ebhoomiharyana.org.in/#no-back-button>): e-bhoomi Haryana portal is a landmark initiative of Government of Haryana to transform the way land is procured in Haryana for public purposes. It will help preventing distress sale of land by offering State Government as the potential buyer.
5. **e-Tendering** (<https://etenders.hry.nic.in/nicgep/app>): e-Tendering web is providing the services i.e. tenders by locations, tenders by organization, tenders by classification and tender's status, etc.
6. **e-Disha** (<https://edisha.gov.in/>): e-Disha portal is providing the services i.e. SC, BC, SBC, Resident/ Domicile, Income, Rural, Marriage Certificate, registration of land, sanction of mutation of land, copy of land record, etc.
7. **E-Tourism** (<https://haryanatourism.gov.in/>): Haryana tourism web is providing the service i.e. accommodation booking, fair & festival, upcoming events and tourism hub, etc.
8. **Property Tax & Fire Tax**
(<https://online.ulbharyana.gov.in/eforms/PropertyTax.aspx>): The link provides the facilities of filling the property tax & fire tax.
9. **e-Ticketing** (<https://hartrans.gov.in/ors/>): Haryana Roadways provide the Online reservation (e Ticket) service to the passengers.
10. **Haryana Enterprise Promotion Portal** (<https://investharyana.in/#/>): Haryana's ongoing efforts to adopt a revolutionary mechanism to help simplify procedures and facilitate ease in doing business with the State supported by state-of-the-art Technology Platform.
11. **e-GRAS** (<https://egrashry.nic.in/>): Online Government Receipts Accounting System (e-GRAS) is an e-Governance initiative of Government of Haryana under Mission Mode Project category and is part of Integrated Financial Management System, e-GRAS facilitates collection of tax/non tax revenue in both the made online as well as manual.



Annexure-D-11.3

SECTOR WISE SMART INFRASTRUCTURE/APPLICATIONS

Table D-11.3.1: Sector wise Smart Infrastructure/Applications

Smart infrastructure	Illustration
1. Mobility	
1.1. Autonomous vehicles	Vehicles outfitted with sensors and software to operate themselves; full self-driving capability (level 4) is achieved when human intervention is not expected to take control at any point.
1.2. Bike sharing	Public-use bicycles, either in docking hubs or free-floating to provide an alternative to driving, public transit, and private bike ownerships. This option can bridge the first-mile / last-mile segment when public transit does not take a commuter from door to door.
1.3. Car sharing	Access to short-term car use without full ownership; can be round-trip (station-based), one-way (free-floating), peer-to-peer, or fractional
1.4. Congestion pricing	Fees for private car usage in certain areas, during times of peak demand, or both.
1.5. Demand-based micro transit	Ride-sharing services with fixed routes, fixed stops, or both, often supplementing existing public transit routes. Algorithms use historical demand to determine routes, vehicle size, and trip frequency. May include options to reserve seats.
1.6. Digital public transit payment	Digital and touchless payment systems in public transportation that allow for prepayment and faster boarding. Includes smart cards and mobile payments.
1.7. E-hailing (private and pooled)	Real-time ordering of point-to-point transportation through a mobile device. Pooled e-hailing involves matching separately called rides with compatible routes dynamically to increase vehicle utilization (that is, local optimization of real-time demand)
1.8. Integrated multimodal information	Real-time information about price, time, and availability of transportation options across many modes.
1.9. Intelligent traffic signals	Improvement of overall traffic flow through dynamic optimization of traffic lights and speed limits, leading to higher average speeds on roads and less frequent stop-and-go conditions. Includes traffic light pre-emption technology, which gives priority to emergency vehicles, public buses, or both.
1.10. Parcel load pooling	Online matching of demand for deliveries with the available supply of trucking capacity. By maximizing vehicle utilization, fewer trucks make a greater number of deliveries.
1.11. Predictive maintenance of transportation infrastructure	Sensor-based monitoring of the condition of public transit and related infrastructure (such as rails, roads, and bridges) so that predictive maintenance can be performed before breakdowns and disruptions occur.
1.12. Real-time public transit information	Real-time information about arrival and departure times for public transportation modes, including informal bus systems
1.13. Real-time road navigation	Real-time navigation tools for choosing driving routes, with alerts for construction, detours, congestion, and accidents. Largely applies to those driving alone or in a car pool.
1.14. Smart parcel lockers	On-site drop boxes at locations where people can pick up packages using individual access codes sent to their mobile devices
1.15. Smart parking	Systems that guide drivers directly to available spaces; can also influence demand through variable fees
2. Security	
2.1. Body-worn cameras	Wearable audio, video, or photographic recording systems, typically used by police officers to record incidents and police operations.
2.2. Crowd management	Technology to monitor and, where necessary, direct crowds to ensure safety.
2.3. Data-driven building inspections	The use of data and analytics to focus inspections on buildings with the greatest potential risks (for example, prioritizing commercial buildings for fire code inspections and homes for lead inspections).
2.4. Disaster early-warning systems	Technology designed to predict and mitigate the effects of natural disasters such as hurricanes, earthquakes, floods, and wildfires
2.5. Emergency response optimization	The use of analytics and technology to optimize emergency response call processing and field operations, such as the strategic deployment of emergency vehicles.
2.6. Gunshot detection	Acoustic surveillance technology that incorporates audio sensors to detect, locate, and alert police agencies to gunfire incidents in real time.
2.7. Home security systems	Security systems that monitor homes and alert users, emergency response services, or both to unusual activity



Smart infrastructure	Illustration
2.8. Personal alert applications	Applications that respond to emergencies by alerting emergency response services, loved ones, or both. Devices (such as personal safety wearables, car crash detectors, and fall alert systems) may transmit location and voice data.
2.9. Predictive policing	The use of big data and analytics (including social media monitoring) to predict where and when crimes are likely to happen with greater precision. These systems are used to deploy police patrols and target prevention efforts.
2.10. Real-time crime mapping	Technology used by law enforcement agencies to map, visualize, and analyze crime incident patterns. Information and intelligence gathering serves as a management tool for allocating resources effectively and creating accountability among officers.
2.11. Smart surveillance	Intelligent monitoring to detect anomalies based on visual feeds including facial recognition, smart closed-circuit TVs, and license plate recognition.
3. Healthcare	
3.1. Data-based public health interventions for maternal and child health	The use of analytics to direct highly targeted health interventions for at-risk populations (in this case, identifying expectant and new mothers to drive educational campaigns about pre- and post-natal care)
3.2. Data-based public health interventions for sanitation and hygiene	The use of analytics to direct highly targeted interventions, such as understanding where to increase rainfall absorption capacity or collecting crowd sourced data on gaps in sanitation systems.
3.3. First aid alerts	Technologies that alert bystanders trained in CPR (Cardiopulmonary Resuscitation) so that cardiac arrest victims receive prompt and critical care
3.4. Infectious disease surveillance	Data collection, analysis, and response to prevent spread of infectious and epidemic diseases. Includes awareness and vaccine campaigns (for example, for HIV / AIDS).
3.5. Integrated patient flow management systems	Real-time hardware and software solutions that provide visibility into where patients are in the system to improve hospital operations and coordinate utilization on a city or multiple-facility level
3.6. Lifestyle wearables	Wearable devices that collect data on lifestyle and activity metrics and inform the wearer; may promote exercise or other aspects of a healthy lifestyle
3.7. Online care search and scheduling	Tools that assist in selecting payers and providers with financial and clinical transparency.
3.8. Real-time air quality information	Sensors to detect and monitor the presence of air pollution (outdoor, indoor, or both) in real time. Individuals can view the information online or on a personal device and choose to modify their behavior accordingly
3.9. Remote patient monitoring	The collection and transmission of patient data for analysis and intervention by a health-care provider in another location (for example, monitoring vitals or blood glucose readings). Includes medication adherence technologies that assist patients in taking medications as recommended by their healthcare provider.
3.10. Telemedicine	Virtual patient and physician interaction through audiovisual technology
4. Energy	
4.1. Building automation systems	Systems that optimize energy and water use in commercial and public buildings by leveraging sensors and analytics to manually or automatically eliminate inefficiencies. Includes optimized lighting and HVAC as well as features such as access / security control and parking information
4.2. Distribution automation systems	Different types of smart grid technologies, including Fault detection, isolation, and recovery (FDIR), M&D, Volt/Var, and substation automation, to optimize energy efficiency and the stability of the power grid.
4.3. Dynamic electricity pricing	Dynamic adjustment of electricity prices to shave peaktime demand and reduce electricity generation cost. By reducing peak demand, cities can reduce the number of power plants that operate during peak hours
4.4. Home energy automation systems	Optimization of home energy consumption using smart thermostats, programmable and remote controllable electronic devices (smart home), and standby electricity control.
4.5. Home energy consumption tracking	Tracking of residential electricity consumption with feedback delivered to the user via mobile app, email, or text to increase user awareness and encourage conservation. Also allows utility companies to measure electricity use remotely.
4.6. Smart streetlights	Connected and sensor-equipped energy-efficient streetlights (including LED) that optimize brightness and reduce maintenance needs. Smart streetlights can be equipped with speakers, gunshot detection sensors, and other features to enhance functionality
4.7. Smart metering	Tracking and controlling energy consumption



Smart infrastructure	Illustration
5. Water	
5.1. Leakage detection and control	Remote monitoring of pipe conditions using sensors, and control of pump pressure to reduce or prevent water leakage. The early identification of leaks can prompt follow-up actions from relevant city departments and utility companies.
5.2. Smart irrigation	Optimization of irrigation using analysis of information such as local weather, soil conditions, plant type, and so forth to eliminate unnecessary watering
5.3. Water consumption tracking	Feedback (via mobile app, email, text, and so forth) on a resident's water consumption to increase awareness and reduce consumption. Smart water meters allow utility companies to measure consumption remotely, reducing labor costs for manual meter reading. It also enables the potential for dynamic pricing
5.4. Water quality monitoring	Real-time monitoring of water quality (in mains, rivers, oceans, and so forth) with alerts delivered to the public via channels such as mobile app, email, text, or website. This warns the public against consuming or coming into contact with contaminated water and prompts cities and utilities to follow up promptly
6. Waste	
6.1. Digital tracking and payment for waste disposal	Digitally enabled pay-as-you-throw systems; includes feedback (via mobile app, email, text, and so forth) delivered to users to increase awareness and reduce waste.
6.2. Waste collection route optimization	The use of sensors inside trash bins to measure trash volume and direct the routes of garbage trucks. This application keeps garbage trucks from travelling to trash bins with little waste volume.
7. Economic development and housing	
7.1. Digital business licensing and permitting	Digitized process (such as an online portal) for businesses to obtain operating licenses and permits
7.2. Digital business tax filing	Channel for businesses to complete tax filing online
7.3. Digital land-use and building permitting	Digitization and automation of the application process for land-use and construction permitting, reducing approval time and increasing transparency.
7.4. Local e-career centers	Online platforms for posting jobs openings and candidate profiles; may use algorithms to match compatible candidates with available jobs. Reduces job-hunting time and increases net new employment.
7.5. Online retraining programs	Lifelong learning opportunities delivered in digital format, especially to help individuals who are unemployed or at risk of becoming unemployed gain new skills.
7.6. Open cadastral database	Complete database of land parcels in the city, open to the public; enables a more efficient land market by creating transparency of available land and lowering the cost of land parcel registration
7.7. Peer-to-peer accommodation platforms	Digital marketplaces where individual hosts can list and rent out short-term accommodations.
7.8. Personalized education	The use of student data to identify individuals who need additional attention or resources; potential to tailor learning environments for individual students
8. Engagement and community	
8.1. Digital citizen services	Digitization of citizen-facing government administrative services such as income tax filing, car registration, or applying for unemployment benefits. Includes digitization of the user journey as well as back-end support functions as needed.
8.2. Local civic engagement applications	Public engagement in city affairs through digital apps. May include reporting nonemergency nuisances and maintenance needs (for instance, reporting broken streetlights via a app), giving input on policy decisions, participating in digital city initiatives (such as open data hackathons), and interaction with city officials and departments on social networks.
8.3. Local connection platforms	Websites or mobile apps that help people connect with and potentially meet others in their community. May be used to find people with similar interests and hobbies, to connect with neighbours, and so on

Source: Adopted from Mckinsey Global Institute research, 2018



Annexure-D-12.1

12. ENVIRONMENT

NCR Environment

1. Existing Status

- 1.1 The NCR as notified, covering an area of about 55,083 sq. km, constitutes the whole of NCT Delhi and sub-regions of three neighbouring states (i.e., Haryana, Uttar Pradesh, and Rajasthan). Two major rivers, Yamuna and Ganga, flow from north to south direction. River Yamuna passes almost through the middle while River Ganga forms the eastern boundary of the region.
- 1.2 Situated in Semi-Arid Bio-Geographic Zone the area supports apart from the rivers, numerous wetlands and dry deciduous to Thorn forests. NCR falls under Upper Ganga plains and Trans Ganga Plains.
- 1.3 NCR is a dynamic urban region with about 230 urban centres, thousands of wetlands, numerous lakes & ponds and 11 notified wildlife sanctuaries/National Parks and endowed with other environmentally rich natural features such as ridge, forest, rivers, green areas, etc. Notified Sanctuaries and National Parks in NCR. (E.g, Chennai restoring its Otteri 18 acre dried lake).
- 1.4 There are about 64 of Ambient Air Quality Monitoring Stations in NCR. With rising air pollution in the region, 07 cities in NCR i.e. Delhi, Faridabad, Ghaziabad, Noida, Meerut, Khurja and Alwar are identified as Non-Attainment cities under the National Clean Air Action Plan¹.
- 1.5 Water Quality in Yamuna, Hindon, Najafgarh drain and West Kali has deteriorated due to direct discharge of un-treated sewage (e.g. Delhi-1901 MLD (45% gap); Ghaziabad- 417MLD (84% gap); Noida - 64 MLD (29% gap) leading to almost Stagnant river. Drainage & Sewerage System issues like Sewerage network in Delhi covers only 45 % population and inadequate sewerage system in other NCR towns, inadequate infrastructure for treatment of Sewage and wastewater (e.g. Treatment capacity exists for only 3200 MLD in Delhi, Noida and Ghaziabad).

2. Note on Aravali Range in NCR

Delhi Ridge is the last leg of the Aravali Range, which traverses south to Delhi from Gurgaon and terminates at Central Delhi. The Aravalis have been divided into three areas in NCR delineating their sensitivity to development namely; The Delhi Ridge, Aravalis at Gurgaon & Faridabad and Aravalis at Alwar.

- i. **The Delhi Ridge** - The Ridge in Delhi is actually an extension of the Aravali hills that enter Gurgaon from south and sprawls towards Delhi. The Ridge has been divided into four zones (**Table D-12.1.1**).

Table D-12.1.1: Classification of Delhi Ridge

S. No.	Zone	Area (in ha)	Features
1	Southern Ridge	6200	Outside the city limits.
2	South Central Ridge	626	Encompasses Mehrauli area
3	Central (or New Delhi) Ridge	864	Within the city limits, just north of Dhola Kuan
4	Northern (or Old Delhi) Ridge	87	The smallest section, lies between Civil Lines and the University of Delhi.
Total		7777	

Source: www.delhi.gov.in

- ii. **Aravalis at Gurgaon & Faridabad, Haryana** – The major portion of forest areas in Aravali section of Gurgaon and Faridabad in Haryana sub-region, mainly passing through agricultural fields or wastelands.

¹ CPCB – <http://cpcbenvs.nic.in/airpollution/finding.htm>



- iii. **Aravalis at Alwar** - The Aravali makes its appearance in the Alwar district from the northeast in Tijara subdivision and runs southward. The hilly ranges enclose between the fertile valleys and alluvial plains.
- A) Acts, Notifications and Court Directives on Aravali**
- Aravali Notification, 1992** - The Ministry of Environment & Forests vide *Aravali* notification dated 7th May, 1992, have restricted certain developmental activities in the specific areas of NCR. The list of process and operations prohibited in specified area of Aravalli Range are given in the Aravalli Notification issued by Ministry of Environment and Forest on 7th May 1992.
- B) Environment Master Plan for Aravali, 1999** – In compliance with the MoEF directive, the Rajasthan State Pollution Control Board prepared and published the **Environmental Master Plan of Alwar District in 2011 (EMP Alwar 2011)**. The Environmental Master Plan of Alwar recommends comprehensive measures for protection of Aravalis in Alwar district. Besides, the Master Plan also recommends, Tehsil wise detailed conservation measures. EMP for other districts in NCR have not yet been prepared.

Table D-12.1.2: Protected Areas in NCR

Sub Region	District	Protected Areas Name
NCT Delhi	South Delhi	Asola Bhatti Wildlife Sanctuary
	Sub-Total	1
Haryana	Gurugram	Sultanpur National Park
	Gurugram & Faridabad	Asola Bhatti Wildlife Sanctuary
Rewari		Nahar Wildlife Sanctuary
	Jhajjar	Bhindawas Wildlife Sanctuary
		Khaparwas Wildlife Sanctuary
	Sub-Total	5
Uttar Pradesh	G B Nagar	Okhla Bird Sanctuary
	Meerut	Hastinapur Wildlife Sanctuary
	Sub-Total	2
Rajasthan	Alwar	Sariska Tiger Reserve
	Bharatpur	Keoladeo Wildlife Sanctuary/ National Park,
		Bandh Baretha Wildlife sanctuary
	Sub-Total	3
NCR	Grant Total	11

Source: Eco-Sensitive Zones (ESZ) Division of MoEF&CC letter dated 16.12.2020 and <http://moef.gov.in/rules-and-regulations/esz-notifications-2/>

3. Key Issues And Challenges

- 3.1 As per India State of Forest Report (ISRF) 2019, of Forest Survey of India, total forest cover and tree cover is 24.56 % of the total geographical area of the country (forest cover is 21.67% and tree cover is 2.89 %). As per the report, the area under forests in NCR is about 3262 (sq. km) which constitutes about 5.75% of its total area, which is much below national average.
- 3.2 Ministry of Jal Shakti (MoJS) has identified many Districts and Blocks across the country including NCR as water stressed. From the information made available by MoJS, many Urban local Bodies (ULBs) are identified as water stressed.
- 3.3 Farmers mainly in Punjab, Haryana and western Uttar Pradesh burn an estimated 35 million tons of crop residue from their fields, after rice harvesting, as a low-cost straw-disposal practice to reduce the turnaround time between harvesting and sowing for the second (winter) crop. Even NITI Aayog in 2018 stated that burning of agricultural biomass residue, or Crop Residue Burning (CRB) in the neighbouring states of NCR is one of the major sources of air quality deterioration in Delhi in the months of October and November. It



is also observed that UP, Punjab and Haryana had got highest Crop residues burnt in the country. Impacts of Crop Residue Burning is a greater concern which constitutes, (a) Smoke & soot particles in air causing air pollution (b) emission of greenhouse gases (GHGs) such as carbon dioxide, methane and nitrous oxide causing global warming, (c) Loss of Nutrients (N, P, K & S), (d) Mortality of active beneficial soil bacteria (e) Soil hardening & erosion due to no cover, (f) Wastage of valuable energy rich residues.

- 3.4 During 2018, “Perception Study on Air Quality” conducted by the ASAR Social Impact Advisors, about 89% people in Delhi feel sickness or discomfort due to the bad air quality. The top four causes of the deteriorating air quality were identified to be motor vehicles (74%), industrial units (58%), tree cutting (56.9%) and construction activities (48.2%)².
- 3.5 The steps taken by the authorities under the Graded Response Action Plan (GRAP) devised by the Environmental Pollution Control Authority (EPCA), could not achieve much of its objective of reducing air pollution of Delhi-NCR.
- 3.6 High noise levels continue to be a serious urban problem in NCR. Delhi was ranked second amongst world’s noisiest cities, as per ranking compiled by ‘The World Hearing’ with data from Mimi Hearing technologies GmbH, WHO and SINTEF in 2018. It is observed that against the permissible noise levels³ (55 dB during the day and 45 dB at night in residential areas), the sound level in cities/ towns often exceeds 70 dB which is alarming concern for all citizens, especially, elderly and children. Faulty & leaking silencers, over-use of horns and vehicles plying on roads accentuate noise level. (E.g. In Europe, the maximum permissible noise levels range from 69 dBA for motor vehicles to 77 dBA for cars, and 83 dBA for heavy two-wheeled vehicles to 84 dBA for trucks).
- 3.7 To provide optimum Green Spaces in urban areas of NCR is also a challenge due to increasing demand for various urban & economic activities. Some of the issues amongst others include (a) segregated land use/ small areas for development, (b) unorganized dump yards for household/industry waste leading to more wasteland, (c) dried wetlands, (d) loss of private urban green space, and (e) loss of wildlife, etc.
- 3.8 National Clean Air Programme (NCAP), 2019 a time-bound national level strategy to tackle increasing air pollution was launched by the MoEF&CC. The NCAP is a mid-term, five-year action plan with 2019 as the first year. The main aim of the programme would be 20-30% reduction of PM_{2.5} and PM₁₀ concentration by 2024. Dovetailing of the existing policies and programmes including the National Action Plan on Climate Change (NAPCC) and other initiatives of Government of India in reference to climate change will be done while execution of NCAP⁴. Clean Air Action Plan has been prepared for many non-attainment cities. Their provisions have to be embedded in the regional plan.

Table D-12.1.3: Total Geographical Area and area under Forest in the sub region

Sub Region	Geographical area (sq. km)	Percentage to of total geographical area	Area under forests (sq. km)	Area under forest (%)
NCT Delhi	1483	2.61	195.44 (13.18)	5.99
Haryana	25203.91	44.44	1277.89(5.07%)	39.17
Uttar Pradesh	16584	29.24	361.92(2.18%)	11.09
Rajasthan	13447	23.71	1426.93 (10.61%)	43.74
NCR	56717.91	100.00	3262.18(5.75%)	100.00

Source: India State of Forest Report 2019, Forest Survey of india

² <https://www.livemint.com/Politics/b8RKgXRbZ35c18LRMUecpN/89-per-cent-people-in-Delhi-feel-sickness-or-discomfort-due.html>

³ <https://tspcb.cg.gov.in/Environment/Ambient%20Noise%20Standards.pdf>

⁴ http://moef.gov.in/wp-content/uploads/2019/05/NCAP_Report.pdf



Table D-12.1.4: District-wise total geographical area and area under forest in the sub region

Sub Region	Districts	Geographical area (sq. km)	Percentage of total geographical area	Area under forests (sq. km)	Area under forest (%)
NCT Delhi	North West	443	29.87	18.04	9.23
	North	61	4.11	4.58	2.34
	North East	62	4.18	3.99	2.04
	East	63	4.25	3.75	1.92
	New Delhi	35	2.36	16.47	8.43
	Central	21	1.42	4.94	2.53
	West	130	8.77	6.85	3.50
	South West	421	28.39	52.19	26.70
	South	247	16.66	84.63	43.30
	Sub Region	1483		195.44	
Haryana	Bhiwani	3283.23	13.03	317.13	24.82
	Charkhi Dadri	1369.78	5.43	0.35	0.03
	Faridabad	742.9	2.95	70	5.48
	Gurugram	1258	4.99	89	6.96
	Jhajjar	1834	7.28	33.71	2.64
	Jind	2702	10.72	4.58	0.36
	Karnal	2520	10	77.21	6.04
	Mahendragarh	1899	7.53	173.42	13.57
	Mewat	1507	5.98	236.21	18.48
	Palwal	1359	5.39	4.38	0.34
	Panipat	1268	5.03	41.53	3.25
	Rewari	1594	6.32	90.63	7.09
	Rohtak	1745	6.92	45.94	3.59
	Sonipat	2122	8.42	93.81	7.34
	Total	25203.91		1277.89	
Uttar Pradesh	Baghpat	1321	7.97	17.06	4.71
	Bulandshahr	4512	27.21	165.12	45.62
	G B Nagar	1282	7.73	20	5.53
	Ghaziabad	1179	7.11	25.22	6.97
	Hapur	660	3.98	-	0
	Meerut	2559	15.43	68.41	18.9
	Muzaffarnagar	4008	24.17	66.11	18.27
	Shamli	1063	6.41	-	0
	Sub Region	16584	100	361.92	100
Rajasthan	Alwar	8380	62.32	1196.66	83.86
	Bharatpur	5067	37.68	230.27	16.14
	Sub Region	13447	100.00	1426.93	100.00
NCR	Total	56717.91		3262.18	

Source: India State of Forest Report 2019



Table D-12.1.5: National Ambient Air Quality Standards

Pollutant	Time Weighted average	Industrial, Residential, Rural and Other Area	Ecologically sensitive area (notified by Central Govt.)
Sulphur Dioxide (SO ₂), µg/m ³ 24	Annual*	50	20
Nitrogen Dioxide (NO ₂), µg/m ³ 24	Annual*	40	30
Particulate Matter (size less than 10 µm) or PM ₁₀ µg/m ³	Annual*	60	60
PM 2.25			

Source: National Ambient Air Quality Standards CPCB Notification New Delhi, the 18th November, 2009.

Table D-12.1.6: AAQ monitoring stations and Status of Ambient air quality in NCR area

Sub region	District	Location of Stations	2019		
			SO ₂	NO ₂	PM ₁₀
NCT Delhi	North West	Jahangirpuri	24.00	25.00	26.00
		Ashok Vihar	21.10	50.26	246.71
		Rohini	21.25	48.49	213.69
		Wazirpur	16.43	39.21	231.45
		Bawana	17.98	68.33	277.89
	North	Alipur	15.22	40.21	239.28
		Narela	26.38	52.93	195.66
	North East	Sonia Vihar	16.53	40.64	223.02
	East	Patparganj	13.21	36.41	210.67
		Anand Vihar	4.59	20.32	179.25
	New Delhi	National Stadium	15.20	82.00	269.00
	Central	Pusa	14.23	59.45	193.03
		Mandir Marg	15.89	64.27	209.00
	West	Mundka	7.96	51.57	200.00
		Punjabi Bagh	19.35	35.34	288.48
	South West	Najafgarh	21.95	64.24	200.00
		Dwarka	16.07	34.79	150.05
		R K Puram	23.54	40.83	289.10
	South	Nehru Nagar	10.04	58.09	212.00
		Sri aurobindo marg	20.67	48.95	206.57
		JLN Stadium	10.24	35.30	168.12
		Dr. Karni Singh Shooting Range	21.75	66.85	205.43
		Okhla	15.66	34.90	181.00
	Shahdara	Vivek Vihar	12.30	38.14	202.04
			20.09	37.82	220.76
	Total		16.87	46.97	209.53
Haryana	Bhiwani		15.46	27.89	172.87
	Charkhi Dadri		7.97	46.07	169.62
	Faridabad		6.51	22.25	313.97
	Gurugram		9.65	17.66	212.04
	Jhajjar		28.39	14.35	212.6
	Jind		6.33	12.57	141.54
	Karnal		25.82	39.7	223.18
	Mahendragarh		6.39	15.71	145.51
	Mewat		6.05	19.92	233.42
	Palwal		18.89	12.54	278.91
	Panipat		35.61	16.57	234.97
	Rewari		13.79	26.7	0
	Rohtak		10.7	15.66	0
	Sonapat		7.93	3.6	0
	Total		14.25	20.80	167.05



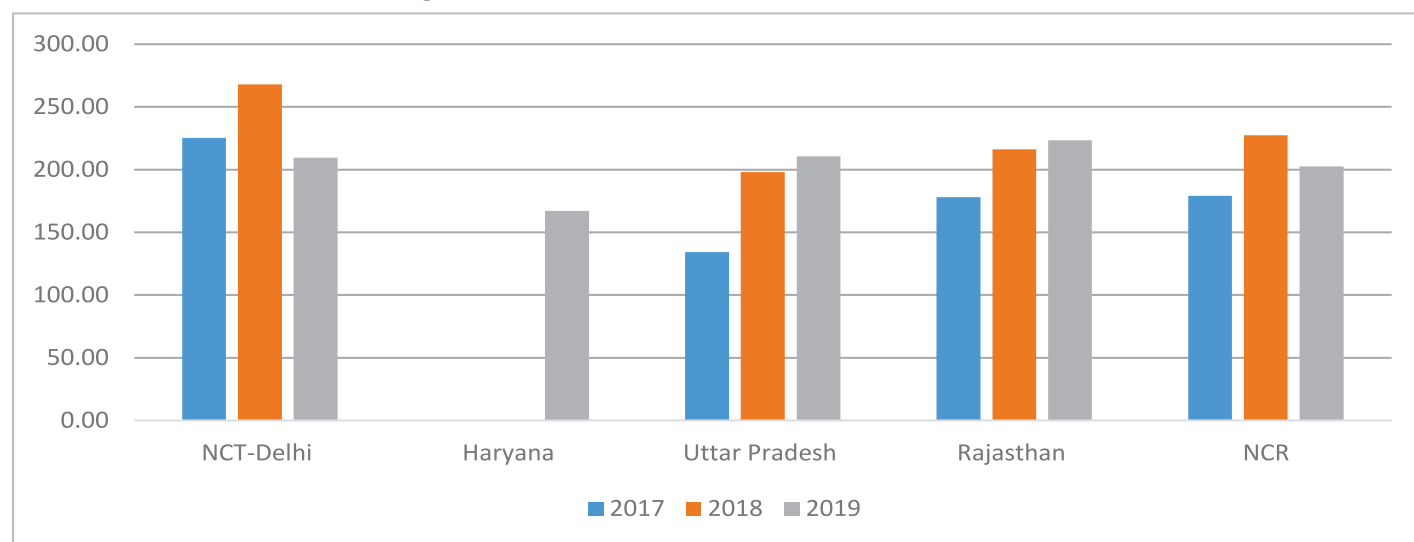
Sub region	District	Location of Stations	2019		
			SO ₂	NO ₂	PM ₁₀
Uttar Pradesh	Baghpat	Begum Bridge	10.6	74.4	221.8
		Kesarganj	7.3	43.2	193.1
		CMO Office (CAAQMS)	29.9	34.7	260
	Bulandshahar	UPPCB, F-5, Yamuna Puram, Bulandshahr	28.3	38.7	204
	Gautam Buddh Nagar*	CNH Industrial India Pvt, Ltd, (New Holland Tractors (P) Ltd), Plot No-3, Udyog Kendra, Greater Noida	15.56	24.66	314.57
		Honda Siel Power Product Ltd, Plot No-5, Sec-41, Ecotech-1, Greater Noida	17.33	25.86	280.86
		(Online Continuous Air Ambient Monitoring System) Sharda University, Knowledge Part-III, Greater Noida	56	62	178
		(Online Continuous Air Ambient Monitoring System) Balak Intercollage, Knowledge Part-V, Greater Noida	10	25	146
		Amity University			
		Sec-1*			
		Sec-116*			
	Ghaziabad	Amko Export BS Road GZB	21.34	46.25	227.43
		Atlas Sahibabad GZB	24.51	51.35	272.5
		Vinoba Bhawe Park Lohia nagar Gzb	14.29	47.99	183.37
		Khora Colony Gzb	14.05	24.35	188.29
		Gyan Khand4, Indirapuram Gzb	32.18	77.33	281.75
		Loni Nagar Palika Loni Gzb	24.63	47.33	321
		Vasundhara sec-16, Gzb	27.2	80.78	257.75
		District Combined hospital Sanjay nagar Gzb	21.48	74.88	260.5
	Hapur*	Sri Nagar Colony, Park Lane, Railway Road, Hapur (U.P.)*	0	0	0
		Jindal Pipes Ltd, 22nd Milestone, Delhi-Hapur Road, Jindal Nagar (U.P.)*	0	0	0
		New Collectorate, Hapur (Continuous Ambient Air Quality monitoring system - started from Sept. 2018)			
	Meerut	Begum Bridge	8.87	72.74	196.5
		Kesarganj	6.71	43.13	176.15
		CMO Office (CAAQMS)			
	Muzaffar-nagar	CAAQMS Station at S.D. Degree College, Bhopa Road, Muzaffarnagar	198.25	36.68	233.85
		Sahara Pariwar Office, Kamal Cinema Building	233.85	39.8	237.31
		Lekhpal Bhawan, Tehsil Sadar Campus	237.31		
	Shamli	Shamli			
	Total		45.20	44.14	210.67
Rajasthan	Alwar	RO Building, RSPCB, 8/43-44 NEB Housing Board, Alwar (station code 372)	10.2	34.1	159
		RIICO Pump house, MIA, Alwar (station code -219)	13.6	37.4	176
		Gaurav Solvex, MIA, Alwar (station code 373)	14.1	40.2	219
		R.O Building	29.0	57.6	296
		UIT Guest House	26.5	59.5	270
		Uttam Strips (Orient Syntex) (Station started from October-2016)	30.7	52.4	239
	Bharatpur	Regional Office Building, RO, RSPCB, Bharatpur	7.36	24.66	184
		RIICO Office Building, RIICO Industrial Area, Bharatpur	7.36	25.24	243
		Khadi Gramoday Samiti, Near Heeradas Bus Stand, Bharatpur	7.88	26.3	224
	Total		16.30	39.71	223.33

Source: For Delhi- NCR Cell Govt. of Delhi & Delhi Pollution Control Committee, For Haryana- Haryana State Pollution Control Board website, For UP-NCR Monitoring and Planning Cell. Govt of Uttar Pradesh and *http://www.uppcb.com/air_quality, and For Rajasthan NCR Monitoring and Planning Cell, Govt of Rajasthan.



Table D-12.1.7: Annual Mean Concentration of PM10 in NCR area

Region/ Sub-Region	2017	2018	2019
NCT-Delhi	225.20	267.98	209.53
Haryana			167.05
Uttar Pradesh	134.32692	197.9965	210.6695
Rajasthan	177.89	216.11	223.33
NCR	179.14	227.36	202.64

Figure D-12.1.1: Annual Mean Concentration of PM10**Table D-12.1.8: Annual Mean Concentration of PM10 in NCR area**

Region/ Sub-Region	2017	2018	2019
NCT-Delhi	22.23	18.51	16.87
Haryana			14.25
Uttar Pradesh	15.468	17.6835	18.51
Rajasthan	9.62	12.70	16.30
NCR	15.77	16.30	16.48

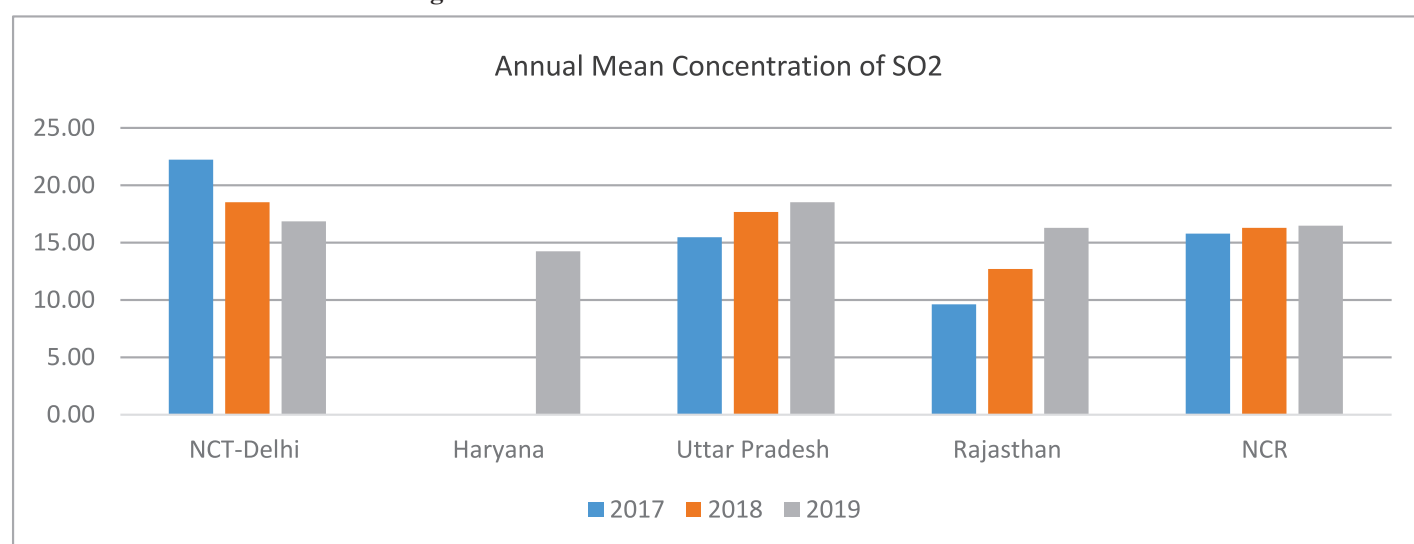
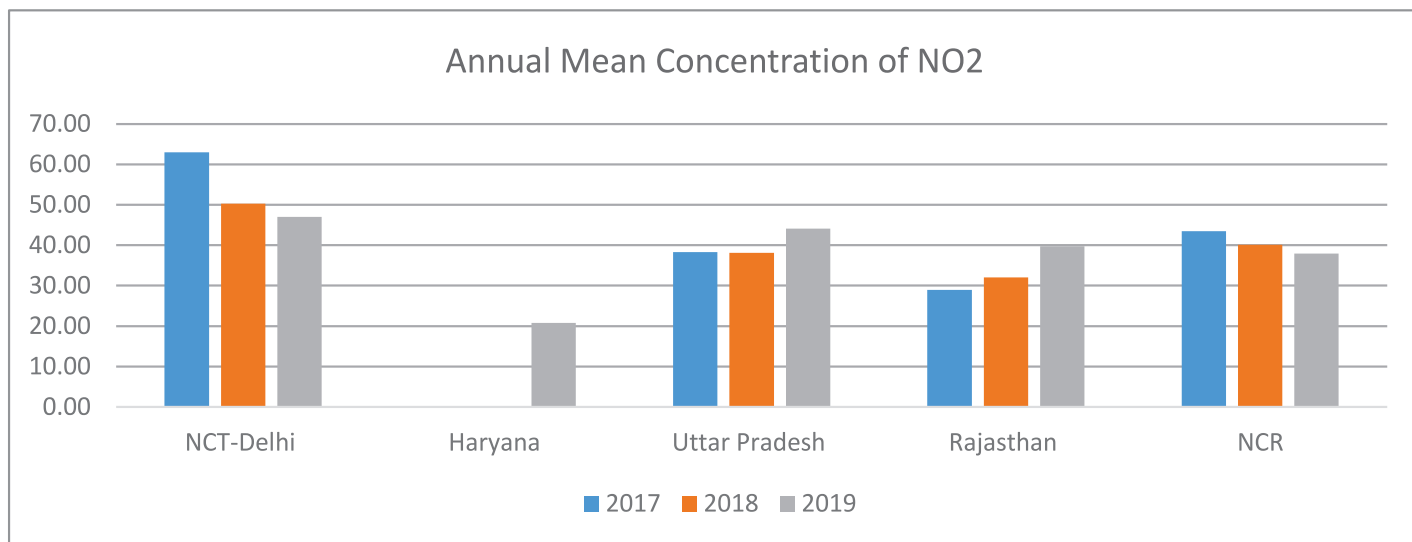
Figure D-12.1.2: Annual Mean Concentration of SO2

Table D-12.1.9: Annual Mean Concentration of NO₂ in NCR area

Region/ Sub-Region	2017	2018	2019
NCT-Delhi	63.00	50.26	46.97
Haryana			20.80
Uttar Pradesh	38.297	38.126	44.14
Rajasthan	28.97	32.04	39.71
NCR	43.42	40.14	37.91

Figure D-12.1.3: Annual Mean Concentration of NO₂

Annexure D-13.1

13. IMPLEMENTATION STRATEGIES & RESOURCE MOBILIZATION**Table D-13.1.1: Resource Mobilization by NCR Planning Board (Rs. in Crores)**

Year	Plan Funds released by Central Government	GNCT-Delhi Contribution	Bonds/Line of Credit*	Loan Released
1	2	3	4	5
1985-86	3.90	--	--	3.75
1986-87	4.25	--	--	4.00
1987-88	6.00	--	--	7.23
1988-89	7.92	--	--	9.36
1989-90	7.60	--	--	9.20
1990-91	10.00	--	--	12.02
1991-92	12.25	--	--	21.14
1992-93	10.00	--	--	8.87
1993-94	20.00	3.50	--	15.78
1994-95	25.00	3.00	--	14.18
1995-96	40.00	3.50	--	109.75
1996-97	40.00	3.75	60.00	146.85
1997-98	42.00	15.00	226.40	84.27
1998-99	45.00	20.00	285.00	206.81
1999-2000	42.00	30.00	0	238.45
2000-01	45.00	30.00	152.40	159.57
2001-02	50.00	25.00	234.75	271.91
2002-03	55.00	0	0	110.86
2003-04	52.00	30.00	0	274.08
2004-05	61.70	30.00	0	275.72
2005-06	70.00	30.00	0	364.95
2006-07	75.00	27.00	0	416.46
2007-08	100.00	50.00	200.00	705.37
2008-09	50.00	50.00	265.10	723.06
2009-10	50.00	0.00	134.90	814.56
2010-11	50.00	0.00	500.00	598.77
2011-12	50.00	0.00	0.00	613.65
2012-13	55.00		209.26	418.51
2013-14	60.00		155.84	355.44
2014-15	80.00		155.44	237.91
2015-16	80.00		2.31	165.15
2016-17	50.00		286.15	1654.48
2017-18	50.00		809.00	1695.42
2018-19	50.00		43.80	993.44
2019-20	50.00		0	795.96



Annexure-D-13.2

COURT ORDERS/DIRECTIVES REGARDING REGIONAL PLAN FOR NCR

Major Court orders and directives are as follows:

1. **The Hon'ble Supreme Court judgment dated 31.03.1994:**

"...the overriding effect of the Act by virtue of Section 27 and total prohibition of any activity of development in violation of the finally published Regional Plan provided in Section 29 of the Act is sufficient to indicate that any claim inconsistent with the finally published Regional Plan in the area cannot be sustained on any ground."

2. **The Hon'ble Allahabad High Court judgment dated 01.10.1996:**

"one stipulation is inescapable that unless the National Capital Region Planning Board gives the green signal nothing can go ahead. The necessary implication of this is also that at every stage in reference to the plans, aforesaid, each Constituent State, a part of the National Capital Region plan, has to keep a close consultation with the federal agency which is the Board."

3. **The Hon'ble Allahabad High Court judgment in the matter of Greater Noida Authority, Master Plan-2021:**

"...Greater Noida Authority cannot proceed to implement Master Plan 2021 till it is permitted by N.C.R.P. Board. Greater Noida Authority shall ensure that no development by it or by its allottees be undertaken as per the draft Master Plan 2021 till the same receives clearance by N.C.R.P. Board. We make it clear that it shall be open to carry on developments by Authority and its allottees as per earlier plan approved by N.C.R.P. Board."

4. **The Hon'ble Punjab and Haryana High Court judgment dated 23.01.2014 in CWP No. 19050 of 2012 in the matter of Chandra Shekhar Misra Vs. Union of India and others has given the following decision:**

"The question now is as what should be the path ahead. If some irregularity has occurred, it cannot be permitted for the future. The matter has to be brought on track. Thus, for the State of Haryana to take any further action in pursuance to its Development/Master Plan, it must first secure the approval of its Sub-Regional Plans."

5. **The Hon'ble Delhi High Court vide its Judgement dated 30.09.2014 in WP (C) No.5559 of 2013 in the matter of Raghuraj Singh Vs. Union of India & Ors. had given the following directions to the NCR Planning Board and State Governments:**

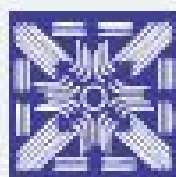
I) Direction to NCRPB

- "(i) to monitor and be vigilant of the developments at site in the NCR and also in preparation of the Sub-Regional Plans and the Master Plans of the towns falling in the NCR;
- (ii) to immediately, upon finding any violations thereof, take action under Section 29(1) of the Act;
- (iii) to regularly, from time to time, keep the Central Government informed of the violations if any of the Regional Plan;

II) Direction to NCR participating States

"forgetting legalese and technicalities, ensure that the purpose for which the NCRPB was created is fulfilled in letter and spirit by ensuring the developments in the respective Sub-regions of the NCR are in accordance with the Regional Plan and by fully cooperating with the NCRPB in this respect".





National Capital Region Planning Board

Ministry of Housing and Urban Affairs, Government of India

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