

9.4 IRRIGATION

9.4.1 Background

Water requirement for irrigation is closely related to population, demand for food, production of non-food agricultural and industrial items, improvement in quality of life and preservation of ecology and environment. Absence of effective guidelines for conservation of agricultural land and the lack of effective controlling mechanism, (legal and institutional) in constituent States, both at the Sub-regional and local levels have resulted in converting the land use from fertile land to urban use regardless of the NCR Plan.

Regional Plan-2001 did not indicate any specific policies and programmes in this regard.

9.4.2 Issues

Studies have revealed that the requirement of water for irrigation in the region cannot be seen in isolation. The demand for drinking water and industrial use should also be considered.

- ***Insufficient Water Sources in the Region***

The present surface water resources of the NCR are insufficient to meet the requirement of the various sectors. A holistic view of water requirements should be taken including the demand for the drinking water supply, industrial use and irrigation assigning priority to drinking water and industrial use.

Drinking water requirement for the entire NCR in the year 2001 was 6,329 mld (6.329 MCM/day or 2,310.07 MCM/annum) and the projections for the year 2021 are 11,984 mld (11.984 MCM/day or 4,374.27 MCM/annum). There is no estimate available for the ultimate industrial requirement of water up to the year 2021. However, it has been assumed as equivalent to the domestic water requirement.

NCR forms part of the most productive agricultural areas of the country. The region is endowed with extensive fertile land and good irrigation facilities. Assuming that only 60% of the cultivable area is irrigated, the requirement of water for irrigation has been suggested as 14,000 MCM by the study group. Thus, total tentative annual water demand of NCR in the year 2021 for drinking water, industry and agriculture is projected to be 22,748 MCM as mentioned below:

Drinking Water 4,374.27 MCM/annum
Industrial use 4,374.27 MCM/annum
Irrigation 14,000.00 MCM/annum
Total Demand 22,748.54 MCM/annum

This water requirement cannot be met from river Yamuna alone. The average annual water availability of river Yamuna up to Delhi has been assessed at 12,000 MCM. The Ganga basin is also water deficit up to Allahabad. Present canal system of Yamuna, Ganga and Bhakra Beas meet the surface water demand of NCR and NCT-Delhi. The MOU signed on 12th May 1994 by the Chief Ministers of the Co-basin States provides

annual allocation of 5,730 MCM to Haryana, 1,119 MCM to Rajasthan, 4,032 MCM to U.P., 378 MCM to Himachal Pradesh and 724 MCM to NCT-Delhi. The agreement takes care of the irrigation and consumptive drinking water needs of all Co-basin States. The MOU also provides for separate agreement to be executed in respect of each storage identified in the Upper Yamuna river basin within the overall allocation made under the agreement.

A part of the demand is also met from ground water. However, entire NCR has been witnessing decline in ground water levels. The decline has been higher in areas underlain by fresh water as compared to areas having marginal to saline ground water. The water levels in Meerut, Bulandshahr and Ghaziabad districts of U.P. had declined by 0.15 to 2.50 metres up to 1995. Similarly, the decline was more pronounced in the areas falling in Rajasthan where water level in Alwar tehsils declined by ten metres, Mandawar Tehsil by nine metres, Kishangarh and Behror Tehsil by seven metres. In the districts of Panipat, Sonapat, Rewari, Rohtak, Faridabad and Gurgaon falling in Haryana State, the decline was of the order of three to seven metres, the decline being more pronounced in Gurgaon, Faridabad and Rewari Districts. The ground water decline in most parts of NCT of Delhi during the decade 1985-1995 had been less than four metres. However, significant decline had been recorded in Central Najafgarh Block, both sides of ridge in southern city block and in the Chhatarpur basin of Mehrauli block. The status of dark and over exploited areas for the ground water is shown in Map 8.2 National Capital Region: Status of Ground Water Availability.

- ***Lack of Ground Water Recharging resulting in the Depletion of Ground Water***

The rate of development of the groundwater resources is unsustainable with most districts of the NCR that are sliding into the dark zone category as discussed in previous paragraph. This is due to lack of ground water recharging, higher rate of withdrawal, fast pace of urbanization and reduction in run off time for rainwater. Thus, recharge of groundwater is a priority.

- ***Sources outside the Region***

Planning and development in NCR, for the existing situation, is based upon the assurance of water supply from the three proposed dams in the Himalayas, for augmenting surface flow. The infrastructure work on these dams is yet to commence. Even if the construction is initiated immediately, these dams would not be ready for use for next 15-20 years, thus jeopardizing the NCR Plan.

9.4.3 Policies and Proposals

The direction of growth in the National Capital Region will depend on the availability of water resources. Demand-supply gap of water is one of the key elements for the growth of the region, which needs to be bridged through various policy interventions and demand management. Following policies are proposed:

- ***Regional and Integrated Approach***

Integrated Water Resource Management Approach for the region is required for optimum water resources utilization and demand management including the demand for

irrigation, drinking water and industry. In order to meet the demand of water in the region for various uses such as irrigation, drinking and industry, the region is dependant upon various multi-purpose River Valley/Dam Projects where large storages can be created and long distance transfer of water is done through canals. While the priority should be given to the drinking water and industrial water demand in the region, the allocation of water for agricultural purposes should also not be discarded. Overall demand of the region should be considered by the Ministry of Water Resources, riparian States and constituent States while signing the MOU for water sharing in consultation with Ministry of Urban Development and Poverty Alleviation. While preparing an over all Integrated Water Resource Management Plan in the Sub-regions, the requirement of water for various purposes, treated sewage effluent and storm water collected through various rainwater harvesting methods should be considered. This should also be incorporated by the States in their Master/Development Plans.

- ***Resources Augmentation, Demand Management and Efficiency in the Use of Water***

Earlier the water used to be developed rather than being managed. With the scarcity of available water, alternative could be proper demand management and efficiency in use of water. It is expected that by the year 2021, there will be additional requirement of 16,748.0 MCM per annum (assuming that only 50% of water from river Yamuna will be made available for NCR out of 12,000 MCM per annum), for which additional water resource has to be created/augmented/existing resource has to be properly managed. Since augmentation of water resources through large dams on the Yamuna and Ganga are likely to take time more than perhaps two decades, as envisaged in the earlier plans, it would be necessary to increase the availability of water by adopting following means:

- ☞ Artificial Recharging and Ground Water Harvesting:

- Artificial recharge through rainwater harvesting in ponds, Yamuna flood plains, paleochannels, ox-bow channels, construction of small check dams at favorable locations in part of the Ridge for recharge etc.
- Utilizing surplus canal water during monsoon period for recharging the depleted aquifers.
- Roof-top rainwater harvesting should be made mandatory in building bye-laws especially in the over exploited and dark Blocks i.e., the areas with unsustainable ground water resources as identified by CGWB.

- ☞ Demand Management of Water:

- It is expected that the treated waste water from sewerage system in the region would be around 2,423.25 MCM per annum which must be put for agricultural/non-potable use to reduce the overall demand for water for irrigation purposes.
- It is expected that water requirement for industrial purposes by the year 2021 in the region would be 4,374.27 MCM per annum, therefore, it is recommended that water based industries should not be allowed in the region.
- Drip Irrigation method should be promoted in the region to save water from irrigation sector. Even if 25% of the water is saved, it would amount to saving of 3,500 MCM per annum.

Decentralization of authority, responsibility and technical units along with community awareness, participation and monitoring of various aspects is a must for any successful water resource management system.

9.4.4 Plan of Action and Phasing of Implementation of Strategies/Policies/Proposals

In order to implement the policies of irrigation in the region, it is imperative to have a phase wise plan of action so that the implementation of policies and proposals in the Regional Plan can be dovetailed with the five-year plans. In view of this, each recommendation has been phased plan-wise where certain activities are to be completed within first five-year of the implementation of the Regional Plan whereas some activities will span over to all the four five-year plans.

All the policies need to be implemented immediately. These include Integrated Water Resource Management Approach for the region for optimum water resources utilization and demand management, augmentation of water resources by adopting rainwater harvesting (micro and macro) and recycling/reuse of treated waste water, adopting sprinkler/drip irrigation. Investment Plan cannot be prepared at this stage because it needs micro level planning at the town/district level. Investment Plan will have to be prepared by the constituent State Governments at Sub-regional level.

Phased programme and plan of action has been worked out to give effect to the proposal and implementation thereof, which is at Annexure 9/II.