ASIAN DEVELOPMENT BANK

TA 7055-IND: Capacity Development of National Capital Region Planning Board (NCRPB) – Package 1 (Components A and C)

Project Appraisal Processes and Procedures Toolkit

(Volume II)

March 2009

Submitted By:
Infrastructure Professionals Enterprise Private Limited, India
in association with
Tamil Nadu Urban Infrastructure Financial Services Limited, India

Acronym

ADB	:	Asian Development Bank
DPR	:	Detailed Project Report
DS	:	Debt Service
DSCR	:	Debt Service Coverage Ratio
EA	:	Environmental Assessment/ Appraisal
ERR	:	Economic Rate of Return
FI		Financial Intermediary
GDP	:	Gross Domestic Product
IRR	:	Internal Rate of Return
ISR	:	Initial Screening Report
MIS	:	Management Information System
NCR	:	National Capital Region
NCRPB	:	National Capital Region Planning Board
NGO	:	Non-Government Organization
PAP	:	Project Affected Person
PDF	:	Project Development Fund
PSMG	:	Project Sanctioning and Monitoring Group
SOE	:	Statement of Expense
TE	:	Total Expenditure
TR	:	Total Revenue
ULB	:	Urban Local Body

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ANNEX 1: MODEL TERMS OF REFERENCE FOR CITY DEVELOPMENT PLANS

Background

As a planning and financial intermediary, NCRPB intends to assist _____ municipalities in strengthening and improving its financial position for effective capital investment management and urban service delivery. These towns are having a good potential for immediate implementation of such financial reforms for which it is essential to formulate a City Development Plan. In this regard, it is proposed to employ consultants for preparing a comprehensive City Development Plan for each of the above towns.

Objectives

The objective of this exercise is to:

- Define the growth directions and service upgradation in relation to the activity mix / growth;
- Look at the demand for the projects specified by the ULBs, and come out with gap in services;
- Broadly outline infrastructure needs;
- Define specific rehabilitation and capital improvement needs with regard to priority city infrastructure in both slums and other areas;
- Define revenue enhancement and revenue management improvements required to sustain the rehabilitation proposed;
- Reform required in local administration and service delivery;
- Manage changes required at the local level to improve O&M of assets, and
- Address common growth and infrastructure issues.

Scope of work

The scope of works covers but is not limited to the following:

- Assess the demand for projects listed out by these municipalities;
- Provide financial assessment of the ULBs[1];
- Increase the general level of service, coverage and quality of municipal services in both poor and non-poor localities;
- Staffing and management arrangements in delivery of services;
- Outlining issues in revenue realizations, quality of existing assets in relation to service levels and coverage, and institutional constraints.
- Developing quick indicators of performance, based on current coverage and additional population in the medium term (10 years) and unit costs,
- Indicating city level investment requirement for upgradation of city wide infrastructure to improve service coverage and asset quality;

[1] An assessment of local finances (past 5 years) in terms of sources and uses of funds, base and basis of levy, revision history and impacts, state assignments and transfers- base and basis of transfer and its predictability; uses of funds outstanding liabilities (loans, power dues, pension etc) and, a review of revenue and service management arrangements.

- Preparing a comprehensive Asset Management Plan and use fiscal notes and policy analysis to assist in making informed investment choices to achieve sector/ city goals;
- Defining priority assets and indicative costs of rehabilitation;
- Conducting fiscal impact analysis of investments: life-cycle O&M costs, revenues from project, and costs/ impacts on finances and of not doing the project;
- Exploring funding options for rehabilitation of facilities; and,
- Preparing a financial and operating plan (FOP).

The FOP is a medium term framework of the ULBs and shall include the following:

A. Additional data to be collected:

- Break up of energy cost on underground sewerage (UG), water supply (WS), etc.;
- Salary for all departments including staff and payments to private operators; and,
- Finding benchmark cost i.e. at ideal condition what will be the cost of the identified investments, a table indicating investment plan for next 5 years with identified source of finance.

B. Areas of reduction in expenditure

- Energy audit resulting in savings in energy;
- Leak detection resulting either in connections or in the tariff (or) maintaining the same supply and achieving a reduction in energy cost;
- Privatizing the municipal solid waste (MSW) collection and identifying a build operate and transfer (BoT) operator for eliminating, composting etc.;
- Laying of cement concrete road/fly ash and savings on maintenance cost resulting in increasing operating surplus;
- Water recycling/reuse;
- Rejuvenation of tanks and reduction of cost/liters of water produced; and
- Privatization and option for revenue-raising.

C. Options for increasing the revenues through non-traditional methods:

- Land development under PPP models for commercial utilities;
- Suggestion for improvement of revenues such as property tax reforms, introducing user charges etc;
- Prepare Memorandum of Association (MOA) between urban local body (ULB) and NCRPB. The MOA will outline the base line (based on a situation analysis) and performance benchmarks. Targets will be based on service development outputs;

- Initiate consultations with council and local stakeholders on priorities;
- Redefine priorities and work with the council to resolve on adoption of the city's FOP and CDP actions.

- Finalize action plan for the city, with a resolution from the council on the priorities and commitment to implement revenue and management improvement measures.

Detailed tasks to be performed:

- The role of the consultant is to assist and encourage full participation and consensus within the city to arrive at an adequate, appropriate and agreed rehabilitation strategy.
- The objective of this assistance is to ensure that the process receives adequate and appropriate methodological and technical guidance in examining the full range of environmental, social, economic and health issues in the city and through communication, consultation and consensus building. The consultants will be responsible for the following:
  - In early stages, consultant will inform, consult and assist the ULBs' in assessment and consultations with stakeholders.
  - The consultant will support establishment of a representative and effective operational working group (OWG) to manage, drive, and guide the process.
  - The consultant will help the OWG to define and manage an appropriate process for the CDP.
  - The consultant will develop and support appropriate participatory methodologies to ensure communication, consultation, and consensus building among stakeholders.
  - The consultant shall, during the course of this assessment, assist ULB in reviewing the works and plans of other government, quasi-government and voluntary organizations operating within the defined area, facilitate, and support documentation of the process.
  - The consultant will review all studies, plans and previous experience in the city, government, quasi- or non-government, academic or private sector. This will include economic development, urban and financial management, environmental protection, municipal service delivery, slum improvement, social development and any other relevant initiatives or studies.
  - The consultants will analyze findings and draw out useful lessons to inform the city action plan. The process shall primarily focus upon the areas of concern that emerge out of the CDP process. Indicative focus areas are:
    - Urban economic development;
    - Social assessment/ poverty reduction;
    - Land use planning and urban management;
    - Urban infrastructure;
    - Human resources and institutional issues;
    - Financial management, and,
    - Environmental management and adverse social impacts (loss of habitat and sources of income).
  - The consultant will carry out analysis to consolidate findings towards the development of priorities, identifying a program or strategy for institutional and policy reform and/or defining a program of short and long term investment.

- Additional primary data collection should be undertaken only if required. The consultants will support any such process but it will be commissioned or undertaken separately from this contract.
- Consultant will provide technical and professional support in the analysis of problems and constraints facing the city, identification of necessary outline investments, determining priorities, identifying interventions that have the greatest potential impact and identifying immediate actions, which could be implemented.
- At all stages, the consultant will work closely with the implementing agency in order to institutionalize planning methodologies and processes building constructive relationships with key stakeholders.

Data inputs from the client

- The Impact Assessment (IA) will lead the study and liaison and coordinate with relevant central, state and quasi-governmental agencies. IA shall appoint nodal officers for consultation, and furnishing relevant data and documentation for consultant's information and review.
- The consultant shall report to the Municipal Commissioner of the ULBs. While the IA will have the overall responsibility of design, a committee comprising officials from funding agency will oversee preparation process.
- A list of projects identified by the municipality shall be given to the consultants.

Outputs, reporting and timing

While the objective of Phase I is to arrive at a demand-supply gap, the objective of Phase II is to derive a comprehensive infrastructure improvement plan for the city, supported by a financial and operating plan outlining the quantum of investments the ULBs can sustain and revenue enhancement measures required. The outputs, schedule and related payment schedule are as follows:

Outputs	Time from Start	Payments
Inception Report: **Demand assessment of identified projects –** The ULBs has identified certain projects, the demand for which would be assessed by the consultant **Rapid Urban Assessment** (RUA) Review of town's economic development, physical planning and growth management issues, physical infrastructure status, social infrastructure status, and municipal fiscal status. The O&M requirements, capacity assessments to operate and maintain systems. Needs: infrastructure and financial improvement needs of the town and identify Capital Investment needs in consultation with local stakeholders.	8 weeks	30%
Interim Report: **Strategic Plan**- Identifying areas of development and physical requirement with special attention would be given to local economic development/ poverty reduction measures [Not a CDP or master plan] **Capital Investment Needs** section comprising system performance assessment, demand assessment, and project identification and costing. The CIP broadly comprise of water supply systems, sewerage and sanitation, solid waste management, storm water drainage, roads, slum infrastructure, and traffic and transport planning. **Priority Asset Management Plan** (O&M plan for services and for lands vested with the ULB's) shall be prepared for the first five (5) years. **Project Risk, Environmental and Social Assessment** (ESA) Project structuring options and associated risks, environmental and social impacts.	12 weeks	30%
Draft Final Report: **Financial and Operating Plan** (FOP) Outlining the revenue enhancement measures required to sustain proposed investments after accounting. For O&M and debt servicing requirements. Suggests suitable actions for project sizing and/or project implementation, and action plans to sustain investments based on capital investment needs listed above. **Policy Interventions**: Institutional and policy reforms– institutional changes and policy reforms required for effective governance and financial management.	14 weeks	20%
Final Report **Technical Assistance**: Outline of the technical assistance requirements for effective implementation of the CIP and draft MoA	16 weeks	20%

Composition of Review Committee:

The review committee includes,

1. Representative of concerned ULB
2. Representatives from NCRPB
3. Representative from Directorate of Municipal Administration

Skill Requirement:

It is expected that the consultant will deploy strategic skills and tools to synthesize and prepare the CDP. Staff should have around 7 years of experience in the municipal / urban development sector with demonstrated capabilities in preparing strategic plans and infrastructure development plans. The following key professionals are to be engaged by the consultants along with required support staff.

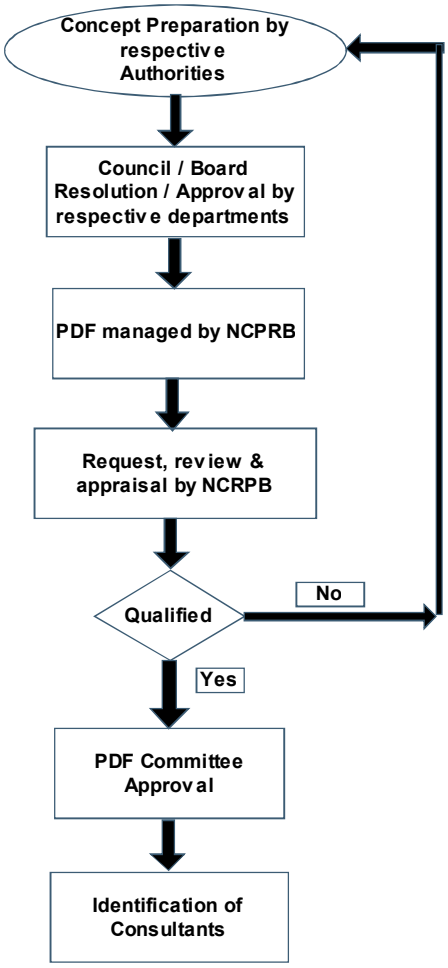
Specialization	Requirements
Urban Planner	Masters in planning with around 7 years experience in design/ implementation city investment plans/ development strategies.
Urban Finance Specialist	Masters in planning/economics/ management with around 7 years experience in municipal finance assessments.
Urban Infrastructure Specialist	Bachelors in civil / public health engineering with at least 7 years in rapid assessment / design of municipal infrastructure.
Environment Specialist	Masters in civil engineering / environmental science with at least 7 years experience in environmental impact assessment/ with adequate exposure to National Environmental Clearances and bank safeguards.
Social Development Expert	Masters in social science with at least 7 years experience in Social assessment and public consultation with adequate exposure to social safeguards of the bank.
Institutional Development Specialist	Masters in planning with around 7 years experience in institutional analysis in the urban sector.

ANNEX 2: STANDARD OPERATING PROCEDURES FOR PROJECT DEVELOPMENT FUND

2.1 Process and Procedures in Handling a Project Development Fund

1. For operating the Project Development Fund (PDF), a committee shall be formed by NCRPB which will approve subproject preparation and monitor the progress of the fund. A set of guidelines is proposed for such fund which is given in Appendix 1. Figure no. 1 illustrates the procedures to be followed for such a fund.

Figure 1: Procedures for PDF



2. **Council / Board Resolution:** Any urban local body / department / agency which has conceived ideas for development of a project in the NCR region, can approach the PDF for technical assistance for preparation of detailed project report / project supervision arrangement. A sample council resolution is given in Appendix 2.

3. **PDF Appraisal Note:** After receiving the council / board resolution, the fund manager, viz., NCRPB shall check if the project concept is in accordance with the Regional Plan 2021. If yes, the fund manager shall proceed with the details of the project, and prepare an appraisal note for the approval of the committee. The broad parameters which need to be checked are project name, cost estimates, background and scope of work to the consultants. A model appraisal note is presented in Appendix 3.

After approval, NCRPB shall proceed with identification of consultants. The process of procuring consultants will follow the approved tender processes followed by the donors of funds. There are specific procurement norms for multilateral agencies, whereas the practice in the state/GoI shall be followed if PDF funds are used from state funds. Detailed terms of reference shall be provided to the consultant, as part of the tender documents. A pre-bid meeting shall be conducted to clarify queries from consultants on various issues in the terms of reference given to them.

2. The consultants shall be selected based on ranges from a least cost selection, quality based selection, and/or, a combination of both.

3. A Least Cost Selection (LCS) is on where consultants are selected on the least financial cost, whereas Quality based Selection (QBS) is the method of selecting consultants purely on quality only without giving any weightage to financial aspects. There is a method which provides weight for both, viz., the Quality and Cost Based Selection (QCBS), which provides weight for both quality of the proposals and financial costs.

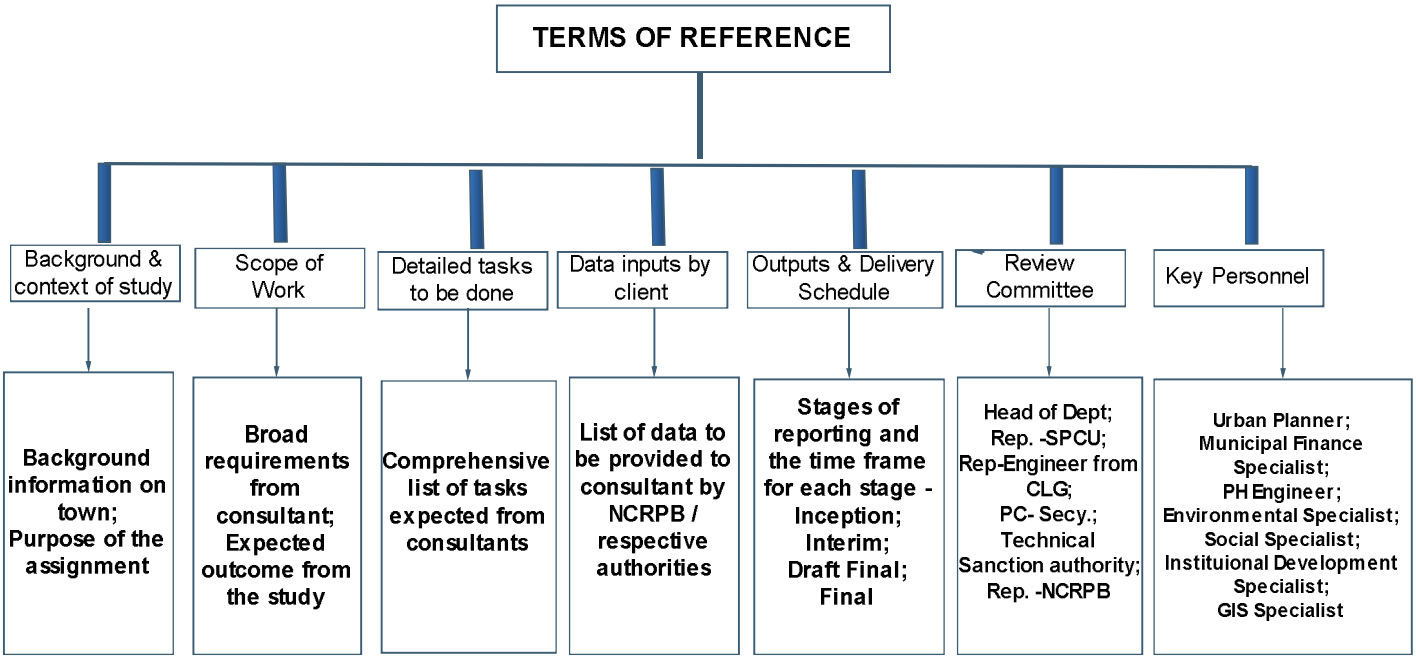
4. A model Request for Proposal (RFP) sought from consultants is given in Appendix 4. The Terms of Reference (TOR) shall be a part of the RFP. A brief write-up on the contents of a TOR is given in Appendix 5.

5. In order to ensure that views of the executing agency on the concepts and designs are being incorporated, constant review at various stages is required. Therefore, a review committee should be constituted consisting of representatives of all stake holders of the sub-project. The committee should consist of:

- Chairman of the Council / Committee;
- Representatives of the respective ULB / Departments / Statutory Board;
- Engineers/Planners of the respective ULB / Departments / Statutory Board;
- Technical Sanctioning Authority of the project; and
- Representative from NCRPB.

6. The role of the NCRPB representative is to ensure that all appraisal requirements are being met at the time of preparation of the sub-project. Figure 4 gives a pictorial representation of the contents of a generic TOR.

Figure 2: Components of Terms of Reference



APPENDIX 1: GUIDELINES FOR PROJECT DEVELOPMENT FUND

I. Introduction

The need to develop bankable urban infrastructure projects requires no elaboration. However, most sponsors such as local bodies and statutory boards are constrained both by availability of experienced skilful personnel and techniques to develop projects that can be executed both under traditional formats and under innovative formats..

Recognizing the need to address these shortcomings, NCRPB intends to develop projects by earmarking amounts as grant funds for technical assistance to their borrowers for developing implement able project reports. A set of guidelines has been suggested for the proposed grant fund, which is named as the Project Development Fund (PDF). These guidelines explain the objectives of the fund, eligible projects, eligible recipients, limit of grant allocation, application and approval procedures, grant management, audit, progress report and review process.

II. Objectives

The PDF will be used to assist local bodies / statutory boards / govt. departments in preparation and or supervision of routine projects such as preparation of DPRs for various sectors, and more complex and innovative projects such and BOTs,.

III. Eligible Activities

Eligible projects include the preparation and or supervision costs of all projects satisfying the objectives in (ii) above in infrastructure sector in local bodies

IV. Limit of Grant Allocation

Not more than 10% of the fund will be allocated to any single project. Not more 40% of the fund shall be utilized for one entity.

V. Application and approval procedures

i) Proposals for projects will be placed before a committee as decided by NCRPB as most appropriate for approval of the grant provision for the required technical assistance. The Member Secretary of NCRPB will be the Member Secretary of the committee. The committee shall take the decision within one week after the receipt of the NCRPB's recommendation.

ii) Proposals for projects would cover the following:

a. Project name
b. Rough cost estimate of project if available / applicable
c. Compliance with Regional Plan 2021
d. Background and need for technical assistance
e. Objectives
f. Scope of services required for the technical assistance
g. Data and any other support to be provided by the project sponsors
h. Institutional capacity to implement the system in case of II(b)

iii) Applications for grants from local bodies / statutory boards / govt. departments shall be received from local bodies / statutory boards/ departments, submitted with a council

resolution / board resolution / approval, as the case may be, with the other details stipulated in para V(ii).

iv) NCRPB will, within 20 days, process the application and prepare the recommendation for assistance sought.

VI. Grant Fund Management

The PDF will be managed by NCRPB based on the above guidelines and according to the existing grant fund management contract between Government of India and NCRPB. NCRPB shall be allowed a fee of 1% of the issues out the PDF.

VII. Audit Arrangement

NCRPB will nominate a firm of chartered accountants to carry out an annual audit of the grant fund, notwithstanding that the Comptroller and Auditor General may also carry out a separate annual audit. The audit report should be ready not less than 5 months after the close of each fiscal year.

VIII. Progress Report and Review

The progress report on the utilization of the PDF will be prepared by NCRPB on a half-yearly basis. Based on the progress report, the performance of the fund would be reviewed by the Member Secretary, on a half yearly basis with special reference to;

a. Number of consultancies resulting in procurement packages
b. Number of consultancies resulting in award of contracts, and
c. Number of projects resulting in securing financing from NCRPB and other Financial Institutions

Based on the review, the Government of India will consider if necessary changes to the guidelines in consultation with NCRPB.

APPENDIX 2: SAMPLE COUNCIL RESOLUTION

Background: Please provide information about the town, the problems that it presently faces, etc.

Need for the project: Should explain broad gap in supply of services with respect to the proposed project

Project proposed: Details of the proposed project, as to what is envisaged as the output of the project

Resolution:

"In this context, it is resolved that the local bodies / Statutory Board / Govt. Department (Name to be mentioned) shall approach NCRPB to appoint consultants for developing the project (Project Name), with the assistance of the Project Development Fund".

APPENDIX 3: MODEL PDF APPRAISAL NOTE

Sub: Appointment of Consultants for preparation of DPR for development of …….

NCRPB after following the ……. procurement guidelines for procurement of consultants intends to appoint the successful bidder for preparation of DPR for development of……..... The details of the consultancy assignment are stated below:

(a) Background and need for the Project:

Based on the council resolution this shall be developed

(b) Objectives:

The objective of the consultancy is to prepare a justified investment plan with detailed design, drawings and estimate for improving the environment, civic status and aesthetic view of …….towns which are significantly affected by the polluted flows…..

(c) Scope of Services:

The sample scope of work covers the following but not limited to:

i. Collection of all the details related to topography and hydrological data of the water bodies.
ii. Study of all the built-up, components, encroachments existing in the water bodies
iii. Study of existing roads, approaches, etc available along the water bodies
iv. Study of discharge points of storm water and drain water entering into water bodies in different points.
v. Carrying out complete carriage system (CS) analysis of the existing water bodies.
vi. Design suitable arrangement for ground water recharge.
vii. Prepare detailed project report with bill of quantities and bid documents in Asian Development Bank approved format.
viii. Design suitable landscaping along the banks of the water body.

(d) Data and any other support to be provided for the project sponsors:

The land details, sketch/ maps and other data related to this work, to the extent available in the Municipality will be provided.

(e) Rough cost estimate of Project

Rs. ____ lacs plus service tax at applicable rates. The expenditure on the above will be met from PDF handled by NCRPB.

NCRPB recommendations:

The proposal for preparation of DPR for development of ……..is part of the Regional Plan 2021, and this project was found to have demands. The procurement of consultants has been based on the procurement guidelines of the ……..and ToR has been prepared. The proposal for withdrawal of funds from PDF, for meeting the financial commitments, on award of consultancy for the above work, to the successful bidder may be approved.

A model PDF appraisal note from TNUDF is reproduced below. NCRPB can customize the note in relation to their subprojects during preparation of such appraisal note.

Chennai Corporation –Bridges
Preparation of Designs, BOQs and Bid documents

TNUDF

GRANT, GF - II

CONSULTANCY APPROVAL CIRCULATION NOTE

TAMILNADU URBAN DEVELOPMENT FUND
112, THEYAGARAYA ROAD, VAIRAMS COMPLEX, 1ST FLOOR,
T. NAGAR CHENNAI – 600 017.

Sent for Signature on: Received on:

CIRCULATION NOTE:

Sub: Sanction of Grant for consultancy for preparation of designs, Bill of Quantities and Bid Documents, for construction of bridges for Chennai Corporation

(Ref.: Letter from COC Br.D.C.No.B3/1097/97 dated 27.05.2003, and Council Resolution No.40738 dated 04.03.2003)

I. Background:

1. The Government, vide G.O.Ms.No.82 dated 23.3.1999 (MAWS (MA II) Department), had constituted a Grant Fund under Tamil Nadu Urban Development Project II, for an amount equivalent to US$ 5Mn. One of the purposes of this fund is for providing Technical assistance to Urban Local Bodies and Statutory Boards both for a preparation of detailed engineering reports for projects and for hiring of consultants for design, management and supervision of projects.

2. A per the Grant Fund Guidelines annexed to the G.O.Ms.No.82 dated 23.3.1999 (MAWS (MA II) Department), application for the following categories shall be submitted to the TNUIFSL:

(a) Preparation of preliminary and detailed feasibility studies including technical designs and procurement packages (without Design, Supervision and Management cost).

(b) Assistance for preparation of detailed designs, procurement packages and supervision, management of Municipal Projects.

(c) Systems improvement for project implementation for ULBs (such as CAD for design) and related training if necessary of personnel in ULBs.

3. In case of application under category (a) above, the recommendations of the TNUIFSL, have to be placed before a committee consisting of, Commissioner of Municipal Administration (CMA), Director of Town Panchayats and the Project Director of the Project Management Unit, TNUDP II, for approval of the grant Provision for the required technical assistance. The CEO of TNUIFSL will be the Member Secretary of the Committee.

4. A copy of the council resolution is annexed. TNUIFSL after following the IBRD guidelines for procurement of consultants intends to appoint the successful bidder for the preparation of designs, drawings, estimates and bill of quantities for the concrete road works in Chennai Corporation. The estimated cost of the assignment is Rs.120.00 Lacs (Approximately).

5. The expenditure will be met from the Grant Fund II under TNUDP II project.

CEO, TNUIFSL CMA DTP PD, PMU

Application for appointment of Consultants

(a) Project Name: Preparation of Designs, Bill of Quantities and Bid documents for construction of bridges in Chennai.

(b) Rough cost estimate of Project: Rs. 120.00 lacs approximately.

(c) Background and need for the Project:

The rapid growth of population in the Chennai Metropolitan Area (CMA) coupled with increasing vehicular population and expanding urban sprawl is causing enormous strain on the existing urban transportation infrastructure. Consequently the adverse effects of traffic congestion are felt at many critical road links and intersections of the city road network. The project is proposed for the purpose of strengthening and expanding the public transport corridors and direct the future developments along the same.

(d) Objectives: The study under this consultancy is to prepare detailed designs, Bill of Quantities and Bid documents.

(e) Scope of Services:

1. The consultant shall carry out soil analysis in all the roads, as per IRC standards and MOST to ensure minimum redundancy in the BOQs.
2. Provisions for footpath in the roads wherever possible.
3. Prepare detailed designs and drawings. Prepare Bill of Quantities and Bid documents in Asian Development Bank Format.

(f) Data and any other support to be provided for the project sponsors:

Schedule of rates to be adopted for BOQs.

(g) Institutional capacity to implement the system in case of II (b): N. A.

TNUIFSL recommendations:

The proposal submitted by the commissioner of Chennai Corporation for appointment of consultants for preparation of detailed designs, Estimates, Bill of quantities and Bid documents for construction of Bridges in certain places of Chennai city were examined. Considering the present conditions of the traffic in the above-mentioned areas, it is found appropriate that consultants may be appointed for designing such a scheme for Chennai Corporation. The procurement of consultants will be based on the procurement guidelines of the Asian Development Bank. The proposal for withdrawal from Grant Fund II under TNUDP II project, for meeting the financial commitments, on award of consultancy for the above work, to the successful bidder may be approved.

APPENDIX 4: MODEL REQUEST FOR PROPOSAL (RFP) DOCUMENT (Asian Development Bank)

LETTER OF INVITATION

Dear Sirs,

Subject:

1. You are hereby invited to submit technical and financial proposals for consultancy services required for [...] which could form the basis for future negotiations and ultimately a contract between your firm and [...].

2. The purpose of this assignment is to:

   (a) [...]
   (b) [...]
   (c) [...]
   (d) [...]

3. The following documents are enclosed to enable you to submit your proposal:
   (a) Terms of reference (TOR) (Annexure 1);

   (b) Supplementary information for consultants, including a suggested format of curriculum vitae (Annexure 2); and

   (c) A Sample Form of Contract for Consultants' Services under which the services will be performed (Annexure 3).

4. The client has received (or, has applied for) a loan from the International Bank for Reconstruction and Development (IBRD)/ credit from the International Development Association (IDA) in various currencies toward the cost of _____ *(name of the project)*, and intends to apply a portion of this loan to eligible payments under this Contract. Payments by IBRD will be made only at the request of client and upon approval by IBRD/IDA, and will be subject, in all respects, to the terms and conditions of the Loan/ Credit Agreement. The Loan/ Credit Agreement prohibits a withdrawal from the Loan/ Credit Account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of the Bank, is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. No party other than the client shall derive any rights from the Loan/ Credit Agreement or have any claim to proceeds.

5.* In order to obtain first hand information on the assignment and the local conditions, it is considered desirable that a representative of your firm visit —— —— before the proposal is submitted. Your representative shall meet the following officials:

   (Name, address, telephone number/Fax number/telex number)

   _____

   _____

Please ensure that advance intimation regarding your visit is sent to enable them to make appropriate arrangements.

6.* A pre-proposal conference open to all prospective consultants will be held on —— @ 1500 hrs in the ————. The prospective consultant will have an opportunity to obtain clarification regarding the scope of the work, terms of reference, contract conditions and any other pertinent information.

* *Delete if considered not required.*

7. **The Submission of Proposals:** The proposals shall be submitted in two parts, viz., Technical and Financial and should follow the form given in the "Supplementary Information for Consultants."

7.1 The "**Technical**" and "**Financial**" proposals must be submitted in two separate sealed envelopes (with respective marking in bold letters) following the formats/schedules given in the supplementary information for consultants. The first envelope marked "**Technical proposal**" should include the description of the firm/organization, the firms general experience in the field of assignment, the qualification and competency of the personnel proposed for the assignment and the proposed work plan methodology and approach in response to suggested terms of reference. The first envelope should not contain any cost information whatsoever. The second envelope marked 'FINANCIAL PROPOSAL' must also be sealed with sealing wax and initialed twice across the seal and should contain the detailed price offer for the consultancy services.

You will provide detailed break down of costs and fees as follows:

- Staffing billing rate plus overheads;
- Travel and accommodation;
- Report reproduction; and
- ————————

Both the sealed envelopes should again be placed in a sealed cover which will be received in the office of the ———————— upto 12.00 hours on ———.

7.2 **Opening of proposal**

The proposals (first envelope containing technical proposal only) will be opened by the ———————— or his authorized representative in his office at 15.00 hours on ————. It may please be noted that the second envelope containing the detailed price offer will not be opened until technical evaluation has been completed and the result approved and notified to all consultants.

8. **Evaluation**

A two-stage procedure will be adopted in evaluating the proposals with the technical evaluation being completed prior to any financial proposals being opened. The technical proposals will be evaluated using the following criteria:

(i) The consultant's relevant experience for the assignment (5 points);

(ii) The quality of the methodology proposed (25 points); and

(iii) The qualifications & experience of the key staff proposed for the assignment (70 points).

Curriculum vitae of senior personnel in each discipline for assessing the qualifications and experience of the personnel proposed to be deployed for the studies should be included with the proposal (in the format of the sample curriculum vitae). These personnel will be rated in accordance with:

(i) General qualifications - (30 points)

(ii) Adequacy for the project (suitability to perform the duties for this assignment. These include education and training, length of experience on fields similar to those required as per terms of reference, type of positions held, time spent with the firm etc) - (60 points)

(iii) their language and experience in the ———————— region - (5 points) [2]

(iv) Involvement in skills transfer program and training ability - (5 points) [1]

9. **Deciding Award of Contract**

a. Quality and competence of the consulting service shall be considered as the paramount requirement. The decision of the award of the contract would be as under:

b. Technical proposals scoring not less than 80 % of the total points will only be considered for financial evaluation.

c. The client shall notify those consultants whose proposals did not meet the minimum qualifying mark or were considered non-responsive to the Letter of Invitation and Terms of Reference, indicating that their Financial Proposals will be returned unopened after completing the selection process. The Client shall simultaneously notify the consultants that have secured the minimum qualifying mark, indicating the date and time set for opening of Financial Proposals. The notification may be sent by registered letter, cable, telex, facsimile, or electronic mail.

d. The Financial Proposals shall be opened publicly in the presence of the consultants' representatives who choose to attend. The name of the consultant, the quality scores, and the proposed prices shall be read aloud and recorded when the Financial Proposals are opened. The Client shall prepare minutes of the public opening.

e. The evaluation committee will determine whether the Financial Proposals are complete [i.e., whether they have costed all items of the corresponding Technical Proposals; if not, the Client will cost them and add their cost to the initial price], correct any computational errors. The evaluation shall exclude local taxes. The Client will select the lowest proposal ['evaluated' price] among those that passed the minimum technical score and invite them for negotiations.

f. During negotiations the consultant must be prepared to furnish the detailed cost break-up and other clarifications to the proposals submitted by him, as may be required to adjudge the reasonableness of his price proposals. If the negotiations with this consultant are successful, the award will be made to him and all other consultants notified. If negotiations fail, and if it is concluded that a contract with reasonable terms cannot be concluded with this consultant, the consultant quoting second lowest cost will be invited for negotiations. This process will be repeated till an agreed contract is concluded.

1 Delete if considered not necessary.

10. Please note that the — — — — — is not bound to select any of the firms submitting proposals.

11. It is estimated that about […….] man-months of services will be required for the assignment and generally you should base your financial proposal on this figure. However, you should feel free to submit your proposal on the basis on man-months considered necessary by you to undertake the assignment.

12. You are requested to hold your proposal valid for 90 days from the date of submission without change the personnel proposed for the assignment and your proposed price. The ————— will make its best efforts to select a consultant firm within this period.

13. Please note that the cost of preparing a proposal and of negotiating a contract including visits to [...], if any is not reimbursable as a direct cost of the assignment.

14. Assuming that the contract can be satisfactorily concluded in ————, you will be expected to take-up/commence with the assignment in ———— (month/year).

15. We wish to remind you that any manufacturing or construction firm with which you might be associated with, will not be eligible to participate in bidding for any goods or works resulting from or associated with the project of which this consulting assignment forms a part.

16. Please note that if you consider that your firm does not have all the expertise for the assignment, there is no objection to your firm associating with another firm to enable a full range of expertise to be presented. However, joint ventures between firms on the shortlist are not permitted except with the prior approval of [.....]. The request for a joint venture should be accompanied with full details of the proposed association.

17. An invitation to submit the proposals have also been sent to the following firms:

    _____

    _____

18. Please note that the renumeration which you receive from the contract will be subject to normal tax liability in India. Kindly contact the concerned tax authorities for further information in this regard if required.

19. We would appreciate if you inform us by Telex/Facsimile:

    (a) Your acknowledgment of the receipt of this letter of invitation; and

    (b) Whether or not you will be submitting a proposal.

Yours faithfully,
( )

Enclosures:

1. Terms of Reference.
2. Supplementary Information to Consultants.
3. Draft contract under which service will be performed.

Enclosure 1: Model Terms of Reference (to be labeled as Annex 1)

The Terms of Reference should include the following:

1. Background:
2. A concise statement of objectives:
3. An outline of the tasks to be carried out:
4. Schedule for completion of tasks:
5. Data, services and facilities to be provided by the Client:
6. Final outputs (i.e., Reports, drawings etc.)That will be required of the Consultant;
7. Composition of review committee and review procedure to monitor consultants work; and
8. List of key positions, whose CV and experience would be evaluated.

S. No.	Key Position	Area of Specific Expertise desired	Minimum Qualification and Professional Experience Desired

Enclosure 2: Supplementary Information of Consultants (to be labeled as Annex 2)

Proposals

(1) Proposals should include the following information:

(a) Technical Proposal

i. A brief description of the firm/organization and an outline of recent experience on assignments/ projects of similar nature executed during the ULBs / Statutory Boardst 3 years in the format given in Form F-2.

ii. Any comments or suggestions of the consultant on the Terms of Reference (TOR).

iii. A description of the manner in which consultants would plan to execute the work. Work plan time schedule in Form F-3 and approach or methodology proposed for carrying out the required work.

iv. The composition of the team of personnel which the consultant would propose to provide and the tasks which would be assigned to each team member in Form F-4.

v. Curricula Vitae of the individual key staff members to be assigned to the work and of the team leader who would be responsible for supervision of the team. The curricula vitae should follow Form F-5 duly signed by the concerned personnel.

vi. The consultant's comments, if any, on the data, services and facilities to be provided by [.....] indicated in the Terms of Reference (TOR).

vii. The consultant's Work program and time schedule for key personnel in Form No.F-7.

(b) Financial Proposals

i. The financial proposals should include the Schedule of Price Bid in Form No.F-6 with cost break-up for the work program indicated in Form F-7.
ii. Two copies of the proposals should be submitted to — — — —.

(2) Contract Negotiations

The aim of the negotiation is to reach an agreement on all points with the consultant and initial a draft contract by the conclusion of negotiations. Negotiations commence with a discussion of Consultant's proposal, the proposed work plan, staffing and any suggestions you may have made to improve the Terms of Reference. Agreement will then be reached on the final Terms of Reference, the staffing plan and the bar chart, which will indicate personnel, periods in the field and office, man-months, and reporting schedule. Based on this adjustments necessary will be discussed and agreed.

(3) Contracts with Team Members. Bearing in mind that rates are negotiable, firms are advised against making firm financial arrangements with prospective team members prior to negotiations.

(4) Nomination of Experts

Having selected a firm partly on the basis of an evaluation of personnel presented in the firm's proposal, [.....] expects to negotiate a contract on the basis of the experts named in the proposal and, prior to contract negotiations, will require guarantees that these experts shall, in fact, be made available. As the expected date of mobilization is given in the letter inviting proposals, [.....] will not consider substitution after contract negotiations, except in cases of unexpected delays on the starting date or incapacity of an expert for reasons of health, or leaving the firm. The desire of a firm to use an expert on another project shall not be accepted for substitution of personnel.

(5) Terms of Payment *

The mode of payments to be made in consideration of the work to be performed by the consultant shall be as follows:

i. 10% of contract value -After unequivocal acceptance of Letter of Award and submssion of inception report.
ii. 50% of contract value -On submission of Intermediate Status Report to client after — months from the start date and on review of the same by client
iii. 20% of contract value -On submission of draft final report
iv. 20% of contract value -On approval of final report

Note: All payments shall be made on submission of pre-receipted bills by the consultants in quadruplicate for respective stages.

(6) Review of reports

A review committee (to be restricted to three members) consisting of following officers of the ————— Department will review all reports of consultants (inception, progress, intermediate and draft final) and suggest any modifications/changes considered necessary within 15 days of receipt.

* *M*odify *as appropriate for each case*

FORM F-1

From

_____
_____
_____

To

_____
_____
_____

Sir:

Hiring of Consultancy services for————of — — — — Regarding

I/We ———————————— consultant/consultancy firm/organization herewith enclose Technical and Financial Proposal for selection of my/our firm as consultant for — — — — — —.

We undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988".

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

Yours faithfully,

Signature: ————
Full name ————
and address:

(Authorized Representative)

FORM F-2

ASSIGNMENTS OF SIMILAR NATURE SUCCESSFULLY COMPLETED DURING ULBS / STATUTORY BOARDS IN LAST 3 YEARS

1. Brief Description of the Firm/Organization:

2. Outline of recent experience on assignments of similar nature:

Sl.No.	Name of assign-ment	Name of project	Owner or sponsoring authority	Cost of assign-ment	Date of commencement	Date of completion	Was assign-ment satisfac-torily completed

Note: Please attach certificates from the employer by way of documentary proof. (Issued by the Officer of rank not below the rank of Superintending Engineer or equivalent.)

FORM F-3

WORK PLAN TIME SCHEDULE

A. Field Investigation

Sl. No	Item	Month-wise Program											
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th

B. Compilation and submission of reports

1. Inception Report
2. Interim Status Report
3. Draft Final Report
4. Final Report

C. A short note on the line of approach and methodology outlining various steps for performing the study.

D. Comments or suggestions on "Terms of Reference."

FORM NO.F-4

Composition of the Team Personnel and the task which would be assigned to each Team Member

1. Technical/Managerial Staff

Sl.No.	Name	Position	Task assignment

2. Support Staff

Sl.No.	Name	Position	Task assignment

FORM F-5

FORMAT OF CURRICULUM VITAE (CV) FOR PROPOSED KEY PROFESSIONAL STAFF

Proposed Position: _____

Name of Firm: _____

Name of Staff: _____

Profession: _____

Date of Birth: _____

Years with Firm/Entity: _____ Nationality: _____

Membership in Professional Societies: _____

_____

Detailed Tasks Assigned: _____

_____

Key Qualifications:

[*Give an outline of staff member's experience and training most pertinent to tasks on assignment. Describe degree of responsibility held by staff member on relevant previous assignments and give dates and locations. Use about half a page.*]

_____

Education:

[*Summarize college/university and other specialized education of staff member, giving names of schools, dates attended, and degrees obtained. Use about one quarter of a page.*]

_____

Employment Record:

[*Starting with present position, list in reverse order every employment held. List all positions held by staff member since graduation, giving dates, names of employing organizations, titles of positions held, and locations of assignments. For experience in ULBs / Statutory Boardst ten years, also give types of activities performed and client references, where appropriate. Use about two pages.*]

_____

Languages:

[*For each language indicate proficiency: excellent, good, fair, or poor; in speaking, reading, and writing*]

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications, and my experience.

_____Date: _____
[Signature of staff member and authorized representative of the Firm]Day/Month/Year

Full name of staff member:_____
Full name of the authorized representative:_____

FORM NO.F-6

SCHEDULE OF PRICE BID

Items	Amount	
	In figures	In words
1. Consultancy services for — — — — — — — — — — — —		
2. Consultancy Service Tax @ ……%		

Signature of Consultant
(Authorized representative)

Cost Estimate of Services

Remuneration of Staff

Staff	Name	Daily (Monthly) Rate (in currency)	Working Days (Months)	Total Cost (in currency)
a) Team Leader		_____		
b) "		_____		
c) "		_____		
		Sub-Total (Staff)		_____

Out-of-Pocket Expenses:

a) Per Diem[1]	Room	Subsistence	Total Cost	Days
		____	_____	_____
b) Air fare:				_____
c) Lump Sum Miscellaneous Expenses:[2]				_____
			Sub-Total (Out-of-Pocket)	_____
Contingency Charges:				_____
TOTAL COST ESTIMATE				_____
CONSULTANCY SERVICES TAX @ ……%				_____

[1] Per Diem is fixed per calendar day and need not be supported by receipts.

[2] To include reporting costs, visa, inoculations, routine medical examination, minor surface transportation and communications expenses, porterage fees, in-and-out expenses, airport taxes, and such other travel related expenses as may be necessary.

* The information in this form is used to finalize Annexe C to the Contract

FORM F-7

WORK PROGRAM AND TIME SCHEDULE FOR KEY PERSONNEL

MONTHS

Name	Position Number of months	1	2	3	4	5	6	7	8	9	10	11	12

Total

Reports Due/Activities and Duration

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Field Full Time _____ Part Time
Reports Due _____
Activities Duration _____

Consulting Services

Draft Letter of Contract for Small Assignments Carried out by Consultants

Subject: (Name of Assignment)

(Name of Consultant)

1. Set out below are the terms and conditions under which (Name of Consultant) has agreed to carry out for (Name of Client) the above-mentioned assignment specified in the attached Terms of Reference.

2. For administrative purposes (Name of responsible staff of Client) has been assigned to administer the assignment and to provide [Name of Consultant] with all relevant information needed to carry out the assignment. The services will be required in (Name of Project) for about _____ days/months, during the period from _____ to _____ .

3. The (Name of Client) may find it necessary to postpone or cancel the assignment and/or shorten or extend its duration. In such case, every effort will be made to give you, as early as possible, notice of any changes. In the event of termination, the (Name of Consultants) shall be paid for the services rendered for carrying out the assignment to the date of termination, and the [Name of Consultant] will provide the (Name of Client) with any reports or parts thereof, or any other information and documentation gathered under this Contract prior to the date of termination.

4. The services to be performed, the estimated time to be spent, and the reports to be submitted will be in accordance with the attached Description of Services.

5. This Contract, its meaning and interpretation and the relation between the parties shall be goverened by the laws of Union of India

6. This Contract will become effective upon confirmation of this letter on behalf of (Name of Consultant) and will terminate on _____, or such other date as mutually agreed between the (Name of Client) and the (Name of Consultants).

7. Payments for the services will not exceed an total amount of Rs. _____.

The (Name of Client) will pay (Name of Consultant), within 30 days of receipt of invoice as follows:

Amount	Currency	
.....	.....	upon receipt of a confirmed copy of this letter and submission of inception report.
.....	.....	upon receipt of intermediate Status Report.

.....	.....	upon receipt of the draft Final report.
.....	.....	upon receipt of the final report acceptable to (Name of Client)

The above remuneration includes all the costs related to carrying out the services, including overhead and any taxes imposed on [Name of Consultants.]

8. The [Name of Consultants] will be responsible for appropriate insurance coverage. In this regard, the [Name of Consultants] shall maintain workers compensation, employment liability insurance for their staff on the assignment. The Consultants shall also maintain comprehensive general liability insurance, including contractual liability coverage adequate to cover the indemnity of obligation against all damages, costs, and charges and expenses for injury to any person or damage to any property arising out of, or in connection with, the services which result from the fault of the [Name of Consultants] or its staff. The [Name of Consultants] shall provide the (Name of Client) with certification thereof upon request.

9. The [Name of Consultants] shall indemnify and hold harmless the (Name of Client) against any and all claims, demands, and/or judgments of any nature brought against the (Name of Borrower) arising out of the services by the [Name of Consultants] under this Contract. The obligation under this paragraph shall survive the termination of this Contract.

10. The Consultant agrees that, during the term of this Contract and after its termination, the Consultant and any entity affiliated with the Consultant, shall be disqualified from providing goods, works or services (other than the Services and any continuation thereof) for any project resulting from or closely related to the Services.

11. All final plans, drawings, specifications, designs, reports and other documents or software submitted by the [Name of Consultants] in the performance of the Services shall become and remain the [property of the Client. The Consultants may retain a copy of such documents but shall not use them for purposes unrelated to this Contract without the prior written approval of the Client.

12. The Consultant undertake to carry out the assignment in accordance with the highest standard of professional and ethical competence and integrity, having due regard to the nature and purpose of the assignment, and to ensure that the staff assigned to perform the services under this Contract, will conduct themselves in a manner consistent herewith.

13. The Consultant will not assign this Contract or sub-contract or any portion of it without the Client's prior written consent.

14. The [Name of Consultants] shall pay the taxes, duties fee, levies and other impositions levied under the Applicable law and the Client shall perform such duties, in regard to the deduction of such tax, as may be lawfully imposed.

15. The [Name of Consultants] also agree that all knowledge and information not within the public domain which may be acquired during the carrying out of this Contract, shall be, for all time and for all purpose, regarded as strictly confidential and held in

confidence, and shall not be directly or indirectly disclosed to any person whatsoever, except with the (Name of Client) written permission.

16. Any dispute arising out of the Contract, which cannot be amicably settled between the parties, shall be referred to adjudication/arbitration in accordance with Arbitration & Conciliation Act 1996.

Place:
Date:

.....
.....
.....

.....

(Signature of Authorized Representative on behalf of Consultant)

.....
.....
.....

(Signature & Name of the Client's Representative)

LIST OF ANNEXES

NR/ls Tuesday, August 02, 2005
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APPENDIX 5: CONTENTS OF TOR

A ToR should contain the following-

i. **Background and the context of the study.** It will provide information on the necessity of the consultancy study to be undertaken;

ii. **Scope of work.** provides broad information on what the consultants have to do in the consultancy study, and what are the expected outcomes of the study

iii. **Detailed tasks to be done.** This gives a list of tasks to be performed by the consultants, which will have to be necessarily complied with and addressed during the study so that the expected result of the consultancy study is relevant and useful for doing the needful.

iv. **Data inputs given by the client.** This section will list out all the data and information to be provided by the SPCU/LA to the consultants for the study, like site maps, data on subproject area, beneficiaries, etc.

v. **Outputs and delivery schedule.** The outputs to be provided by a consultant are also known as "deliverables". Deliverables/outputs specify the reports to be submitted by the consultant within the specified time frame. Deliverables/outputs need to be specified in unambiguous terms for avoiding any ambiguity in understanding by the consultants and the ULBs / Statutory Boards.

vi. Specific **deliverables**/output to be submitted by the consultant are mentioned below:

vii. **Inception Report.** It contains preliminary information collected by the consultants on the subproject. It also contains an understanding of the ToRs by the consultant and the need for amending, changing or addition of new ToR as suggested by the Consultant. The report also contains details on the existing situation in the subproject area, the approach, framework and the methodology to be adopted by the consultant for addressing the ToR.

viii. **Interim Report.** Gives more detail on the subproject like identification of sites, options of various technologies, basic financial status of the LA. It can also contain any emergent situation or issues that need to be taken care of on a priority basis.

ix. **Draft Final Report.** Gives project-specific design according to the ToR given to the consultant. It will contains also detailed BoQ, Detailed cost estimates of the subproject, means of financing, financial data of LA and other details as required by the ToR. On receiving the draft final report, detailed comments are given on the contents of the report especially in the context of the ToR and the extent to which the Consultant has appropriately addressed them.

x. **Final Report.** The Consultant then submits the final report after addressing the comments given on the draft final report along with site maps, design maps and bid documents and procurement packages.

xi. **Review committee.** The ToR may contain requirement for constitution of a committee that will be reviewing the progress made in the consultancy study at every stage of the study. The consultants can be requested to make a presentation on a regular basis, so that the consultancy study is in line with LA's/SPCU's requirements.

A model TOR of each sector is given in Enclosure 1. The model contains sectors such as solid waste management, water supply, storm water drain, underground sewerage systems, concrete roads & bus stands.

ENCLOSURE 1: MODEL TERMS OF REFERENCE

I. Model TOR for Solid Waste Management

Terms of Reference for Preparation of DPR for Integrated Solid Waste Management for Cluster 1 covering ……Corporation and surrounding municipalities

1. Background:

In order to manage the solid waste in a scientific manner in the Municipalities, this proposal intends to engage consultants to assess the present status of solid waste management, suggest methods / improvements in an integrated fashion covering household segregation, collection, transportation, compost yard and sanitary landfill and also prepare detailed roject reports for system design, compost yard and common sanitary landfill facility selected based on remote sensing and physical verification along with a financial model to be developed.

2. Objectives:

As per the direction of the Supreme Court, the Urban Local Bodies have to manage the solid waste in a scientific manner by segregating the bio-degradable waste and recyclables at the source itself and dumping the inert wastes in the common sanitary landfill facility. The bio-degradable waste has to be utilized either for power generation or for composting. Depending upon the feasibility, a few pilot projects could be implemented for producing electrical energy and the remaining ULBs will convert bio-degradable waste into compost as this seems to be a better and sustainable solution for managing with the organic waste. The recyclables are to be disposed at the secondary collection point itself and need not be transported further.

In this regard, the objective of the consultancy is to review the present status of solid waste management, in the towns specified in terms of source segregation & collection, existing adequacy of staff, existing transportation and disposal arrangement and to prepare a detailed project report covering cost required to achieve near 100% source segregation & collection, fund requirement for IEC to achieve the same, innovative method for collection and least cost transportation, size of compost manufacturing arrangement taking the population growth in the next 20 years and to develop land fill by taking into account decreasing quantity of dumping of bio-degradable material in the land fill so that the cost of land fill development is reduced in Cluster 1 towns which is not restricted to ..... Corporation and …….. municipalities with detailed designs, drawings, cost estimates and bid documents.

3. Scope of work:

The scope of work covers but not limited to the following:

(i) To conduct a random waste characterization study in the ULBs.

(ii) To establish current status and baseline of solid waste management in the municipality

(iii) Based on the above, analyze the technical, economical, environmental, financial and social feasibility for various components of solid waste

management such as source segregation, collection, transportation, treatment and disposal by composting and sanitary landfill.

(iv) To analyze the costs involved with complete breakups for the above methodologies of waste disposal for the municipality

(v) To carry out on-site geological mapping of the site and investigate the topography, geomorphology, hydrogeology, stratigraphy and other geological characteristics like the porosity, permeability etc. which will have significant influence on the design criteria for various facilities to be provided in and around the area of waste disposal suggested.

(vi) To identify clusters in addition to the towns mentioned for setting up common landfill facility based on cost benefit financial analysis.

(vii) To develop a financial model in order to have a cost-effective transportation solution for the entire cluster.

(viii) Based on the above, work out cost-benefit analysis of individual towns involved in the cluster.

(ix) To suggest an institutional framework for the construction, operation and maintenance of the regional landfill

(x) To prepare EA and identify measures for mitigating the environmental impacts if any.

(xi) To prepare detailed designs, drawings, estimates and bid documents for the facilities that are required for effective operation of the disposal facilities and maintaining the environmental standards.

(xii) To examine the possibility of posing the project for CDM potential and assist the ULBs in obtaining the same by preparing the baseline parameters, PIN etc. and to analyze the financials of the ULBs taking into account the above credits.

4. Tasks to be performed by the design consultants:

The consultants are required to carry out the following tasks in line with MSW 2000 Rules and Regulations.

Task-1: Random Waste Characterization study in the ULB

i. Carry out rapid waste characterization study, taking into account the characteristics of waste at different time and season as a result of floating population.

ii. Calculate the total quantum of garbage generated in the town along with the break up details as per the characterization.

iii. Identify the sources for each category of the garbage categorised based on the waste characterization study

Task 2: Establish Current Status/base line of Solid Waste Management in the ULBs

Based on the characterization study and the secondary information available establish the baseline in the following areas by carrying out the following studies:

i) Study the current practices in solid waste management in the individual towns and check the adequacy of the system covering the following

   a. Storage of waste at source,
   b. Segregation of recyclable waste at source,
   c. Primary collection of waste from the doorstep,

d. Sweeping of streets,
e. Secondary storage of waste,
f. Transportation of waste including transfer stations,
g. Treatment of municipal solid waste and disposal of waste

ii) Adequacy of solid waste management staff and their capacity available with the municipality. The adequacy should be checked separately for collection, transportation and dumping.
iii) Existing method of collection and mode of transfer of waste generated.
iv) Transport facilities for both primary and secondary collection available with the municipality
v) Extent of waste generated and the waste collected in the municipality
vi) Extent of house hold segregation of the waste generated
vii) Extent of source collection.
viii) Existing disposal facilities available with the municipality
ix) Identify the deficiencies in the existing systems of solid waste management.
x) Identify the involvement of NGO's and private parties in the solid waste management activities in the municipality
xi) Prepare a breakup of expenses made by the municipality for all the above activities

Task-3: Develop a plan of action for effective Solid waste management for the municipality

Based on the above, develop a plan of action for effective solid waste management for the municipality considering the characterization of waste in the municipality and the technical, economical, environmental, financial and social feasibility of collection, segregation, transportation and disposal of waste.

i. Assess the waste generation and its future projection
ii. Assess the extent of compliance of MSW rules 2000 with reference to seven steps mandated in the MSW rules referred in Task 1.
iii. Prepare a road map for the source segregation and source collection.
iv. Assess the need and prepare designs and specifications of tools, equipments, vehicles, machinery and manpower for system improvement.
v. Suggest institutional strengthening measures for ULBs through training, capacity building and induction of professionals for system improvement and also suggest institutional framework for setting and managing regional landfill.
vi. Prepare a road map for involving NGO's, SHGs and Private operators for primary and secondary collection taking into account the retirement/transfer of the solid waste management staff and carry out cost benefit analysis.
vii. Prepare a detailed plan and road map for IEC activities for convincing people regarding source segregation and estimate capital and recurring cost for the same.
viii. Carry out random survey among the public covering both domestic and non-domestic to assess willingness and capacity to pay for the conservancy charges.
ix. Prepare a least cost solution for transporting the garbage from source to disposal site. This has to be prepared by considering various alternatives like privatization of vehicles, leasing the maintenance of vehicles, shortest haul routes, etc.
x. The size of land requirement for composting should be done by considering the waste characterization and considering the existing compost facility available with the local body.

xi. The size of land requirement for scientific land fill should be done by considering the waste characterization and according to the road map of source segregation. Since the quantity of garbage to be dumped in the landfill will be reduced significantly with the increase in the level of segregation of bio-degradable and recyclable wastes, the landfill must be optimally sized and designed.

Task-4: Examine Alternative Methods for effective solid waste management

The consultants have to examine alternative methods for collection, segregation, transportation, treatment and disposal of waste and suggest the best option with cost benefit analysis for individual towns in the cluster identified. The consultants have to prepare road maps for each of the alternatives.

Task-5: To develop a financial model for cost effective solution

The consultants shall do a cost-benefit analysis of individual towns involved in the cluster in terms of collection, segregation, transportation and disposal. The analysis shall include developing a financial model for the entire cluster as a whole which would attract BOT operations. Various alternatives may be suggested with appropriate sensitivities so that the most optimal model shall be recommended.

Task 6: Assess the market and value of compost and recyclables.

i. The consultants shall identify the potential market to sell the compost near the town.
ii. The consultants have to assess the market value of the compost as per the quality of compost generated. The consultants have to address the pricing and branding aspect of the compost generated.
iii. The consultant shall prepare a marketing plan for selling the compost.
iv. The consultants have to prepare a clear cut action plan for disposal of recyclables in a cost effective manner specifically for each of the municipalities.

Task 7: Assess the Geological characteristics of the waste disposal area

The consultants shall carry out on-site geological mapping of all the disposal site identified and investigate the topography, geomorphology, hydrogeology, stratigraphy and other geological characteristics like the porosity, permeability etc. which will have significant influence on the design criteria for various facilities to be provided in and around the area.

Task 8: Landfill and Composting Design and Specifications

The Consultant shall develop the design, construction and operation specifications for compost facility and landfill in accordance with the MoEF criteria and guidelines and get it certified and approved from Tamil Nadu Pollution Control Board (TNPCB). The consultants have to design the facility, considering the waste characterization and the road map of source segregation. Given that source segregation to achieve more than 90% in 3 years and all biodegradable waste to go for composting, landfill standard to be designed by factoring in the above. In other words, the first few cells would need development to the standard prescribed in the guidelines and later cells which will get minimal of biodegradable matters, need not be of very high standard.

This task should include:

i) Developing a grading plan showing sequence of cell development over time, including the necessary earthwork to accomplish this. This should also include cell closure and post-closure restoration

ii) Estimating and preparing drainage plans for the leachate and surface runoffs while recommending site development measures that minimize leachate generation

iii) Designing a leachate collection system, together with a method for determining the effectiveness of this system so as to ensure that the landfill and compost yard will be functioning properly

iv) Designing systems for disposal of leachate and surface runoffs, including likely drop inlets, piping, holding tanks, and connection to the leachate treatment plant within the main facility area

v) Technology assessment for leachate treatment to the prescribed disposal standards and designing of leachate treatment plant

vi) Designing the landfill gas capturing system and flaring the same.

vii) Designing a suitable lining system

viii) Selecting construction techniques and materials

ix) Determining waste placement and cover methods to minimize stability problems, and to reduce infiltration of both surface water and groundwater. The landfill must be designed with sub-cells so as to carry out the filling operation in a phased manner. The first sub-cell may be designed to cater for five years period for the projected waste generation and the subsequent cells have to be designed keeping in view the level of source segregation achievable over a period of five years.

x) Designing monitoring well systems

xi) Developing a recommended site layout of the storage, treatment and disposal facilities (including land occupied, floor area, plant layout, transportation, storage, power supply, water supply, and sewage system); and

xii) Designing a suitable site access system

xiii) Providing details on appropriate analytical methods, instruments and on-site laboratory facilities, preparing an equipment list and performance specifications in this respect

xiv) The option for designing the landfill site with sub-cells, each phased for 5 years should be considered

xv) Prepare detailed/itemized cost of landfill facility and compost yard. The cost estimates shall include capital cost; operation and maintenance cost; and post closure cost. The estimate should also include the cost of Information Education and Communication component.

The above task is required only for the cells that will initially get bio-degradable materials also, which will gradually get reduced in view of progressive attainment of source segregation.

The consultants have to carry out risk assessment of the above design option and suggest suitable risk management plan highlighting the issues. The consultants have to also prepare a plan for monitoring the post project quality of air, soil and water including flies, birds etc.

Task 9: Prepare EA Documentation

The consultants have to draft the Environmental Assessment complying with the MoEF notification, CPCB guidelines and ESF requirements. The EA shall include public consultations and disclosure draft EA and address the comments prior to finalization. The consultants have to submit the Environmental Assessment to the agencies concerned for formal review and approval.

Task 10: Submit detailed design, drawings and estimates for the suggested waste disposal facilities.

The consultant shall submit detailed reports on design, drawings and cost estimates for every waste disposal facilities suggested including bid documents as per Asian Development Bank format. The cost estimates provided by the consultants should include complete breakups and justify the economics of the methodology.

Task 11: Examine for CDM potential:

The consultant shall examine the possibility of obtaining CDM potential either for individual town or as a group of towns for all the components involved in the proposed solid waste management facilities. The consultants shall also prepare the baseline parameters, PIN and work out the financials taking into account the above CDM credits.

5. Permissions required:

(i) Assist the Municipality in obtaining clearances from various statutory authorities for developing the sanitary landfill and compost yard.

(ii) Necessary approvals from the Pollution Control Board (PCB), Municipal Administration, MoE, CPHEEO if required would be obtained by the consultants with necessary assistance from the Municipality.

6. The consultants' responsibility would include:

(i) Data

The details given in the technical conditions and specifications taken in conjunction with the study, is only a reasonable preliminary basis. The nature of the overall contract is such that after the proposal, the consultant shall be wholly responsible for all the details of the proposal, the physical and site conditions, the execution methodology etc. All data utilized in preparation of the proposal shall be presented indicating the sources of the data and also the basis of assumptions, if any. The consultant shall be responsible for all the data or designs and drawings given by them.

(ii) Project Site Survey

The local body shall indicate the Project sites and their measurements. The consultant shall be responsible for its verification.

(iii) Survey and Analysis

The consultant shall conduct his own studies and prepare estimates based on standard schedule of rates specified by the department and a market survey for items not covered by the SSR. The Tamil Nadu Urban Infrastructure Financial Services Limited as well as the local body concerned shall not be responsible (except as to risks specifically accepted under the conditions of contract) for the validity of the project details, designs and estimates. The Consultant shall be responsible for this. Based on the surveys and designs evolved by the consultants, within the framework and the requirements of the project, the consultants have to prepare detailed items and quantity schedules and subsequently work out the cost estimates.

(iv) Soil Investigation and Tests

Soil tests as per relevant I.S. / IRC Standards have to be done by consultants to arrive at design parameters for the formation and safe bearing capacity.

(v) Instrumentation

All necessary instruments to carry out the study shall be arranged and operated by the consultants at their own cost.

(vi) Project Designs

For the given purpose and functional use of the respective projects, proper design has to be developed. The consultants have freedom to choose the type of sub structure and superstructure provided code specification / CPHEEO stipulations are met. The drawings and designs shall include a general arrangement drawing and detailed drawings of all components in size A1 or A2. The level of detailing shall be such as to enable check of conformance with code provisions, including detailed construction drawings and bar bending schedules.

(vii) Technical Sanction

The consultants shall assist the Municipality in obtaining technical sanction from competent authorities.

7. Schedule of Completion of Tasks:

a)	Inception report detailing the current practices in Solid waste management in the ULBs	20 days
b)	Interim Report covering the analysis of various alternative methods proposed for waste collection, segregation, transportation and disposal	40 days from the date of approval of inception report
c)	Draft project report with design and estimates	75 days from the date of approval of interim report
d)	Final project report with detailed design, drawings, estimates	20 days from the date of approval of draft project report
e)	Bid documents after technical sanction	25 days from the date of approval of final DPR

The DPR should be completed in a period of 180 days.

8. Terms of Payment to the consultants

The consultants are required to quote a total lump sum cost for the work. The payment to the consultants will be made as per the break up given below:

(i) 10% of contract value on submission and acceptance of Inception report

(ii) 20% of Contact value on submission and acceptance of Interim report

(iii) 40% of contract value on submission and acceptance of draft project report.

(iv) 20% of contract value on submission and acceptance of final project report.

(v) 10% of contract value on submission and acceptance of bid documents.

9. Data, Services and facilities to be provided by the client

(i) The maps, waste characterization report and other data related to this work, to the extent available in the Municipality will be provided.

(ii) Assistance for obtaining FMB sketches, for preparing land plans from the land survey department will be given by the ULBs.

10. Final Outputs (i.e. Detailed project reports incl. drawings, reports etc.,) that shall be furnished by the consultant:

a. Inception report covering task 1 and 2 detailed above.
b. Interim Report covering task 3, 4 and 5 detailed above.
c. Draft project report covering task 6, 7, 8, 9, 10 and 11 detailed above
d. Final Detailed Project Report incorporating the comments on draft project report
e. Bid documents as per Asian Development Bank format.

The consultant should submit 5 copies of all reports separately for each of the towns except bid documents for which they should submit 10 copies. Soft copies of all the reports should also be handed over. (MS WORD for documents and AutoCAD for drawings)

11. Composition of Review Committee to monitor Consultant's work:

a. Representatives of the ULBs.
b. Representative of Municipal Administration
c. Representative of NCRPB
d. Representative of PCB
e. Outside experts as required

12. Procedure for review of progress reports.

The review committee will review the progress of the work through the presentation to be made by the consultants during each stage of the reports. The comments or views on the various reports shall be given to the consultant within 7 days of the presentation. The decision / suggestion carried out will be reviewed in the next meeting.

13. List of key professional positions whose CV and experience would be evaluated:

S. No.	Key Professional	No. of Persons	Experience
1.	Project Manager	1	A post graduate in Public health Engineering/Environmental Engineering or Environmental Science/Geo-technical Science with about 7 years experience in design of one sanitary landfill as per MSW Rules and statutory provisions of PCB.
2	Project Engineer	1	A graduate in Civil Engineering with about 5 years experience in design of compost yard and one sanitary landfill as per MSW Rules and statutory provisions of PCB
3	Institutional and	1	A post graduate in management / finance with

	Finance specialist		about 5 years experience in financial structuring of projects and setting up institutional frameworks
4.	Environmental Engineer	1	A post graduate in Environmental Science/Geo-technical Science with about 5 years experience in Environmental Impact Assessment including adequate exposure to National Environmental Clearances and preparation of Environmental monitoring plan.
5.	Social Specialist	1	A post graduate in Social Science with about 3 years experience in Social Assessment and public consultation with adequate exposure to social safeguards.
6	Solid Waste specialist	1	A graduate in Public health / environmental engineering with about 5 years of experience in setting up solid waste management systems

The consultants should be supported by other staff as required

II. Model TOR for Water Supply project prepared for a town in Tamil Nadu

TERMS OF REFERENCE

WATER SUPPLY TO ……CORPORATION – IMPROVEMENT WORKS AND SYSTEM IMPROVEMENT

1. PROFILE OF THE ……CITY:

……..is the second largest city in the state of Tamilnadu next to Chennai and the District Head quarters of ..... District. It is a pilgrimage centre and gateway to south Tamilnadu having the famous Meenakshi Temple at its core. It is also a trading centre famous for its Handloom industry

……is located in south central part of Tamilnadu at a distance of around 500 Kms from Chennai, in southwest direction. It is situated on 9°55° north latitude and 78°7° east longitude.

…….is situated on the banks of River Vaigai. The River Vaigai flows across the city North West to South East.

……..is surrounded by Dindigul and Trichy Districts in the North, Theni on the west and is surrounded at its outskirts by small and prominent hills viz (Anaimalai,Nagamalai, Pasumalai and Sikandearmalai) Sivaganga in the east and Virudhunagar in the south. The city is well connected to other parts of the country by Rail, Road and Air.

……is a major junction on Chennai – Kanyakumari Railway line. National Highway NH7 and NH49 pass through the centre of the city and Domestic Airport connect the city with other major cities of India.

The city has grown on both sides of River Vaigai and its terrain is mostly flat. The city is about 100 mts above mean sea level.

The major groups of soil that are found in …….and its environs are the black and red variety. Karisal, Cheval and Vandal are the soil types found in its surroundings.

…….is known for its hot climate. The seasons of the city and its environs can be divided as follows:

- The dry season (January to March)
- Hot season (April to May)
- South – west Monsoon period (June to September)
- North – east Monsoon period (October to December)

The average maximum and minimum temperature are 41.6’C and 20.9’C respectively.

Rainfall is intermittent and irregular and usually heavy during the northeast monsoon. The average Rainfall is 85 cm per annum. The wind blows from north and eastern direction during January and February and from Southwest direction during May to July.

…….Local planning area comprises of ..... City and its environs, which include both rural and urban settlements. The ..... Corporation covers 51.83 Sq.Km. with the total population of 9.22 Lakhs as per 2001 census, whereas the ..... agglomeration comprising the city and the surrounding settlements cover an area of 115.48 Sq.Km.with the population of about 10.5 Lakhs. The floating population of ..... city is about 2.00 Lakhs.

2. WATER SUPPLY ARRANGEMENTS:

..... City is dependent on Vaigai Dam and Vaigai river for its drinking water needs. From Vaigai Dam, a quantity of 1500 Mcft of water has been allotted for supplying water to ..... City. The quantity of water is utilised as noted below:

About 65 MLD is conveyed through pipeline from Vaigai Dam and treated at Pannaipatti treatment plant. This quantity is supplied to the west, south and Eastern parts of the city. The flow is dependable throughout the year. This way 900 Mc.feet is utilised. This is a 100% gravitational system. 600 Mcft of water is let into the river for wetting the riverbed and extracted from the riverbed through the infiltration galleries located on the upstream of ..... City, at Kochadai and Melakkal. The untreated water is pumped from these two head works to Ground Level Reservoir. From this ground level reservoir water is pumped to the distribution system of northern part of the city. Periodical release of water is done by PWD from Vaigai Dam for wetting the riverbed. The flow is dependable for seven months a year. This way 600 Mcft is utilized. During September to February there will be monsoon flow of water in the river and this flow is also utilized. About 5 MLD of water collected through the Manaloor and Thiruppuvanam headworks (situated in river bed at the downstream of ..... City) is pumped and supplied to a part of the eastern portion of the City.

The total no. of service reservoirs in the city is 23 and their storage capacity is 35 ML. Of this, 13 OHTs are located in the area south of river Vaigai and the balance in the north side. The total length covered by piped water supply is 447 Km. The total no of assessments in the city is 1,98,612. The house service connections are provided for 86,910 domestic, 3190 non-domestic and 203 industrial. In the non-domestic connections water is used for drinking purpose only. Water is not used for any processing or as raw materials in the industrial connections.

There is a proposal to tap water from Cauvery River near Karur for improving the water supply positions to Dindigul Municipality and habitations around it at a cost of Rs.100 crores. The proposal to extend the scheme to ..... City is also under consideration. There are a few irrigation tanks in and around ..... like Vandiyoor tank, Madakulam tank, Thrupparankundram tank and Nilayoor tank. All these tanks are major PWD tanks. Due to urbanisation most of the ayacut has been converted as building sites and they have a very little ayacuts as of now. Action is being initiated by the City Corporation to convert these tanks as water storage tank for the drinking water needs of ..... City.

3. PROBLEM STATEMENT:

3.1 The total allocation of water in Vaigai Dam for the drinking water needs of ..... City is 1500 Mcft. This is the maximum quantity. The Government has been requested to increase the quantity to 2000 Mcft. It may consider the request when the storage level of Periyar Dam is raised to 152 feet. Though the water is meant

fully for drinking purpose of ..... City, when drawn from riverbed it suffers heavy loss due to percolation and unauthorized tapping by wayside agriculturists. With 900 Mcft through pipes it is possible to distribute 65 MLD throughout the year where as with 600 Mcft through river it is possible to supply 20 MLD for a period of 7 months only. For the balance 5 months the water supply from riverbed is dependent on the unpredictable monsoon rains.

3.2 Of the 1,98,612 households in the city, only 90303 have water supply connections. The balance households in the extension areas of North part of the city have no piped distribution systems. These areas are supplied 1 MLD of drinking water through lorries once in 3 days. The fast developing areas of Corporation in the north zone like P & T Nagar, Sellur, Circuit house, Meenakshi Nagar, Press Colony, Surveyor Colony etc., do not have piped drinking water supply. The OHT's in the vicinity do not receive adequate water supply. The east zone of ..... e.g.Villapuram and Anuppanady, receive inadequate supply whereas other areas get more water supply. In certain parts, the distribution pipes which were laid before long back have deteriorated and often drainage water or wastewater mixes with drinking water. In such places the distribution system has to be re-laid with new pipes.

3.3 Water does not reach the 13 OHTs located in the south side and is distributed directly in the distribution system which could not be accounted for properly. There are heavy leakages occurring in the distribution mains.

4. OBJECTIVE

The main objective of the study is for providing a economically and environmentally sustainable public water supply system that is acceptable to the community in terms of affordability, availability, security of supply and quality standards and be sufficiently flexible to meet the present demands.

5. SCOPE:

The scope of work covers the following -

Based on the requirements , the work involved in the project, is divided in two phases –

Phase I:

i. Designs for laying pipe lines for north zone (for 600 mcft. Capacity
ii. Designs for consstructing WTP (for which land has already been acquired by the Corporation), for 600 mc.feet capacity.
iii. Internal distribution lanes to the noth of Vaigai river with block regulation to ensure equitab0le water supply in ward nos.1 to 21.

PhaseII:

i. Internal distribution for more equitable water supply through block regulation, in ward nos.22 –72
ii. Designs for Internal Distribution in unserved areas in the south & western side for 90 mld.
iii. Feasibility of summer storage facility at Madakulam.

Phase II study shall include preparation of BOQs also for distribution pipelines for the unserved areas.

6. TASKS TO BE CARRIED OUT

6.1. Suggest proper zoning and block regulation in order to give equitable water supply with optimal utilization of existing infrastructure facilities.

6.2. Examine the possibility of linking water supply system from north to south of river Vaigai at salient locations.

6.3. Identify potential options for the long term system improvements with recommendations for addressing environmental, institutional and regulatory issues if any. Estimate the investments required including O & M for various identified options with financial analysis taking into consideration of increased water tariff for capital and revenue requirements.

6.4. Based on cost-benefit analysis and cost projections, prioritize the investment proposals for system development.

7. THE CONSULTANT RESPONSIBILITY WOULD INCLUDE:

7.1 Data

The details given in the technical condition is only on a reasonable preliminary basis. The nature of the overall contract is such that after the proposal, the consultant shall be wholly responsible for all the details of the proposal, the physical and site conditions, the execution methodology etc., All data utilized in preparation of the proposal shall be presented indicating the sources of the data and also the basis of assumptions, if any. The consultant shall be responsible for all the data or designs and drawings given by them.

7.2 Project Site Survey and Analysis

The Consultant shall conduct his own studies and prepare estimate based on schedule of rates specified by Government but updated to reflect actual market conditions. The consultant shall make market enquiry and adopt the least rate for the item which are not covered by standard schedule of rates. The consultant shall furnish the Rate Analysis with the report. The Tamilnadu Urban Infrastructural Financial Services Limited as well as the local body concerned shall not be responsible (except as to risks specifically accepted under the conditions of contract) for the validity of the project details and designs and estimates.

7.3 Survey

The local body shall indicate project sites and their measurements. The consultant shall be responsible for its verifications. The consultant shall be responsible for carrying out the survey to determine the losses of water in the system and conditions of the pipes.

7.4 Soil Investigation report:

Soil tests as per relevant I.S. / IRC Standards have to be done by consultants to arrive at design parameters for the formation and safe bearing capacity. At locations proposed for important installations like pump house, OHT/sumps etc., at least one bore hole for every such installation, should be made to determine the SPT N values at depth specified in the relevant IS codes. Soil samples taken from bore holes

should be visually classified, index properties determined and presented in along with the final report. These bore holes should be normally taken to a depth whose 'N' value is greater than 100 plus a further 3 m depth (to account for any drastic fall in 'N' value below this strata). The subsurface water at each bore hole be sampled and a chemical analysis carried out, to recommend appropriate cement/admixture for use in concrete mixed for the foundations. Recommendations of a geo-technical expert should be furnished in the soil report and should cover aspects like appropriate soil stabilisation measures if required, bearing capacity of the founding strata etc.

7.5 Instrumentation

All necessary instrumentation such as flow meters, energy meters etc shall be arranged and operated by the consultants at their own cost.

7.6 Project Designs

For the given purpose and functional use of the respective projects, proper design has to be developed. The consultants have freedom to choose the type of substructure and superstructure provided code specification / CPHEEO stipulations are met. The drawings and designs shall include a general arrangement drawing and detailed drawings of all components n size A1 or A0. The level of detailing shall be such as to enable check of conformance with code provisions, including detailed construction drawings and bar bending schedules.

7.7 Estimation of quantities.

Based on the surveys and designs evolved by the consultants, within the framework and the requirements of the project, the consultants have to prepare detailed items and quantity schedules and subsequently work out the cost estimates.

7.8. Bids.

Preparation of bid documents, in the Asian Development Bank prescribed format.

8. SCHEDULE OF COMPLETION OF TASKS:

Phase I:

(a) Inception Report	15days from the date of signing of the agreement.
(b) Interim Report	45days from the date of acceptance of inception report.
(c) Draft rehabilitation plan	40days from the date of acceptance of interim report.
(d) Final report inclusive of BOQ and bid documents	20days from the date of acceptance of draft rehabilitation plan.

Phase II:

(a) Inception Report	120 days from the date of signing of the agreement.
(b) Interim Report	30 days from the date of acceptance of inception report.
(c) Draft rehabilitation plan	20 days from the date of acceptance of interim report.
(d) Final report inclusive of BOQ and bid documents	10 days from the date of acceptance of draft rehabilitation plan.

9.TERMS OF PAYMENT

The mode of payment to be made in consideration of the work to be performed by the consultant shall be as follows:

Phase I:

(a) 10% of contract value on submission of Inception Report
(b) 20% of contract value on submission of Interim report
(c) 20% on submission ofDraft rehabilitation plan.
(d) 10% of contract value on submission of final report inclusive of BOQ and bid documents
(e) 40% of contract value on submission of final report inclusive of BOQ and bid documents for Phase II.

10. DATA, SERVCES AND FACILITIES TO BE PROVIDED BY THE CLIENT:

The maps and other data related to this work, to the extent available in the corporation office will be provided.

(a) Detailed drawing of the present distribution system with relevant particulars to the extent available.
(b) Assistance for installation of instrumentation for measuring flows, energy efficiency assessment
(c) The available contour map of ..... City

11.FINAL OUTPUTS (I.E. DRAWINGS, REPORTS ETC.,) THAT WILL BE REQURED OF THE CONSULTANT

Phase I:

(a) **Inception report**: General discussion about source of water, present distribution system and macro level details along with framework for collection of data
(b) **Interim report**: Shall contain feasibility analysis, preliminary designs, institutional strengthening etc.
(c) **Draft Rehabilitation plan**:Draft bid documents, BOQs and detailed designs.
(d) Final report - final Bid documents, BOQs and detailed designs

Phase II:

(a) Inception Report
(b) Interim Report
(c) Draft final report
(d) Final report

The consultant should submit 5 copies of all reports, documents and drawings mentioned above. Soft copy of all documents and Auto CAD drawings shall be submitted.

12. COMPOSITION OF REVIEW COMMITTEE TO MONITOR CONSULTANT'S WORK:

(a) Commissioner/ City Engineer, ... Corporation
(b) Representative of Commissioner of Municipal Administration, Chennai.
(c) Nominee of TNUIFSL
(d) Representative from TWAD
(e) Representative from PWD, ...

13. PROCEDURE FOR REVIEW OF PROGRESS REPORTS

The review committee will review the progress of the work. The decision / suggestion carried out will be reviewed in the next meeting. The comments or views on the various reports should be given to the consultant within 7 days of submission of the respective reports/documents/designs.

14. List of Key professional positions whose CV and experience would be evaluated.

S.No	Key Professional	No. of persons	Experience
1.	Project Manager	1	A graduate in Civil Engineering with about 20 years experience in preparing master plan for water supply improvements including augmentation, treatment, transmission and distribution with exposure to water supply system operations.
2.	Project Engineer (Civil)	1	A graduate in Civil Engineering with about 10 years experience in the field mentioned above with exposure to leak detection and NRW studies.
3..	Project Engineer (Electrical / Mechanical)	1	A graduate in Electrical / Mechanical Engineering with about 10 years experience in selection and installation of pumps electrical panel boards etc and erection works.

III. Model TOR for Storm Water Drains project prepared for a town in Tamil Nadu

TERMS OF REFERENCE
STORM WATER DRAINS FOR ..... TOWN PANCHAYAT

1. BACKGROUND:

..... is a selection grade Town Panchayat, covering an area of 4.78 Sq.km and the population is increased from 14,881 in 1991 to 44127 as per 2001 census. The town is situated at about 13 km from Chennai between Poonamallee High Road (NH4) and Arcot Road. The major occupations in the town include business, trade and services. The town has acquired urban characteristics in the past decade since it is emerging as one of the suburbs of Chennai

The town panchayat presently maintains 68.00 km of roads. The present population is around 60000 and it contains 13500 households. The town suffers due to inundation of rainwater during monsoon periods, as there is no proper integrated storm water disposal system. Hence the town panchayat intends to provide a better surface drainage system to get rid of this problem.

It is proposed to appoint a consultant to study the above problem and suggest remedial measures with feasibility analysis. The proposal of the successful consultant could lead to signing of the contract for design consultancy.

2. OBJECTIVE:

The objective of the consultancy is to analyze the technical feasibility, financial, economic, environmental and social aspects, prepare detailed design, drawings, cost estimates and bidding documents for planning and implementation of Storm Water Drains for .....

3. SCOPE OF WORK:

   a. Collecting and updating information regarding flood levels in the study area during rainfalls of different intensity.

   b. Carrying out an inventory of existing storm water drainage systems including natural watercourses, ponds and roadside drains, estimate their existing capacity for disposal of storm water and other sewage effluents and the level of deficiencies.

   c. Carrying out topographical survey with reference to G.T.S. datum.

   d. Design and preparation of detailed project report with bid documents in the World Bank prescribed format.

4. TASKS TO BE CARRIED OUT:

a. Using available maps, aerial photographs, topographic sheets and also reconnaissance and detailed surveying of the catchment and sub-catchment areas, determine storm water flow and show on a plan in the form of modules each module covering a catchment area of about 80 hec. or otherwise mutually agreed to.

b. Carryout detailed topographic survey and leveling to prepare longitudinal sections of the system and cross sections of important rivers, major nallahs and drains covering a width of 15 m on either bank generally at intervals of 10 m along with L-sections and detailing all the temporary and permanent structures met within that width. All the structures and encroachments will also be marked with enough details.

c. Indicate the details of other underground services, mainly sewers and water mains (electrical cables) which are in the vicinity of the storm water drainage system and show their distance from storm water drains with a view to know about the possibility of providing by-pass storm water drain and for deciding their location.

d. Indicate the inundation area clearly, showing probable depth of water accumulation in case of intensity of rainfall for 6 hours in the range of 2.5 – 7.5 cm.

e. Locate all temple ponds and flood water holding ponds/zones in part portions of open gardens or playgrounds – showing therein probable size duly dimensioned should be shown on plan along with various arrangements / devices to dispose off the accumulated water to nearest outfall or conserve the water so as to reduce the shortage of water supply and to be shown in a tabular proforma.

f. Utilizing proven and readily available computer modeling software, carry out analysis of existing situation of storm water drains to identify deficiencies and develop alternative strategies and options for expansion / augmentation of the existing system to address system deficiencies.

g. Prepare detailed cost estimates based on item rate basis using the latest schedule of rates. Estimate necessary road restoration charges wherever needed. Assist the town panchayat in getting administrative / technical sanction for the scheme from competent authorities. There should not be any lumpsum items in the bill of quantities. For items not covered under schedule of rates, market rates to be assessed.

h. Prepare environmental and social assessment report as per the ESR guidelines developed by TNUIFSL and prepare necessary Environmental Mitigatory plans (EMP) or Resettlement Action Plans (RAP).

i. Prepare tender documents based on the Asian Development Bank model documents.

j. Draw up project budget with monthly targets, furnish network analysis such as CPM / PERT for purposes of effective project monitoring and regular reports.

k. Prepare the project implementation schedule for execution and contract packaging plan.

l. Involve the Engineer / Executive Officer of town panchayat at all stages.

5. CONSULTANT RESPONSIBILITY

The Consultants responsibility would include:

Survey Investigation & Concept Feasibility:

Data : The details given in the technical conditions and specifications taken in conjunction with the study, is only a reasonable preliminary basis. The nature of the overall contract is such that after the proposal, the consultant shall be wholly responsible for all the details of the proposal, the physical and site conditions, the execution methodology etc. All data utilized in preparation of the proposal shall be presented indicating the sources of the data and also the basis of assumptions, if any. The consultant shall be responsible for all the data or designs and drawings given by them.

Project Site Survey and Analysis : The consultant shall conduct his own studies and prepare estimates based on schedule of rates. The Tamilnadu Urban Infrastructure Financial Services Limited (TNUIFSL) as well as the local body concerned shall not be responsible (except as to risks specifically accepted under the conditions of contract) for the validity of the project details and designs and estimates.

Survey: The local body shall indicate the Project sites and their measurements. The consultant shall be responsible for its verification.

Detailed Designs & Cost estimates:

Project Designs: For the given purpose and functional use of the respective projects, proper design has to be developed. The consultants have freedom to choose the type of sub structure and superstructure, provided code specification / CPHEEO stipulations are met. The drawings and designs shall include a general arrangement drawing and a detailed longitudinal section drawing of all components in size A1 or A2. The level of detailing shall be such so as to enable check of conformance with code provisions, including detailed construction drawings and bar bending schedules.

Estimation of Quantities: Based on the surveys and designs evolved by the consultants, within the framework and the requirements of the project, the consultants have to prepare detailed item and quantity schedules and work out the cost estimates.

Tender: Preparation of Bid documents, in the Asian Development Bank prescribed format.

6. DATA, SERVICES AND FACILITIES TO BE PROVIDED BY THE CLIENT

The maps and other data related to this work, to the extent available in the town panchayat office will be provided.

7. SCHEDULE OF COMPLETION OF TASKS

a.	Inception report	15 days
b.	Interim report – feasibility analysis and preliminary design	30 days
c.	Draft design and estimate	45 days
d.	Final design and estimate with draft bid documents	60 days
e.	Final bid document	75 days

8. TERMS OF PAYMENT

(i) 10% of Contract value on submission and acceptance of Inception Report

(ii) 25% of contract value on submission and acceptance of Interim report, consisting of feasibility analysis and Preliminary designs on alternative cost effective proposals

(iii) 35% on submission and acceptance of draft designs and estimates.

(iv) 20% of contract value on submission and acceptance of Final designs and estimates and draft bid documents.

(v) 10% of the contract value after technical sanction from competent authority and submission of final bid document.

9. FINAL OUTPUTS (i.e. drawings, reports etc.,) that will be required of the consultant:

a. Inception report: General discussion about macro level details.
b. Interim report: Feasibility analysis and preliminary design including alternate cost effective proposals.
c. Draft Final Report: Draft design & cost estimate
d. Final Report: Final detailed design along with flow chart, drawings and cost estimates.
e. Draft Bid Document.
f. Final Bid document.
g. ESR & EMP reports.

The consultant would be required to submit five copies of each of the reports except final bid document for which he shall submit 10 copies besides providing a soft copy of the final project report, other reports and Auto CAD drawings.

10. Composition of Review Committee to monitor Consultant's work:

f. Executive Officer, ... Town Panchayat
g. Representative of Directorate of Town Panchayats, Chennai
h. Representative of TNUIFSL
i. Representative of Commissioner of Municipal Administration.

11. Procedure for review of progress reports.

The review committee will review the progress of the work. The decision / suggestion carried out will be reviewed in the next meeting. The comments or views on the various reports shall be given to the consultant within 7 days of submission

12. List of key professional positions whose CV and experience would be evaluated:

S. No.	***Key Professional***	***No. of Persons***	***Experience***
1.	Project Manager	1	A graduate in Civil Engineering having

			specialization in Hydrology with about 15 years experience in designing flood routing structures including Storm water drains.
2.	Project Engineer (Civil)	1	A graduate in Civil Engineering with about 10 years experience in the field mentioned above.
3.	Financial Specialist	1	An economist / planner / finance specialist with about 5 years experience with adequate exposure to municipal financial analysis

Other persons should support the above team especially by environmental and social specialists to ensure that these safeguards are complied with.

IV. Model TOR for Underground Sewerage Scheme project prepared for a town in Tamil Nadu

TERMS OF REFERENCE FOR UNDERGROUND DRAINAGE
FOR ..... TOWN PANCHAYAT

1. BACKGROUND :

..... Town Panchayat, a selection grade town panchayat, covers an area of 4.78 sq.km and has a population of 14,881 as per 1991 census and 44127 as per 2001 census. The town is situated at about 13 km from Chennai between Poonamallee High Road (NH4) and Arcot Road. The main occupations in the town include business, trade and services. The town has acquired urban characteristics in the past decade as it is emerging as one of the suburbs of Chennai

The panchayat presently maintains 68.00 kms. of roads. The present population is around 60000 and the panchayat contains 13500 households. The panchayat presently does not have a underground drainage system. The sullage and waste water from the households in the town is presently let into the open storm water drains which ultimately accumulate as a stagnant pond on the south eastern corner of the town, leading of breeding of mosquitoes and unsanitary conditions. ....., with a large urban population characterized by high growth in consumption patterns would necessarily require an underground sewerage system. There are existing underground drainage channel for about 5 kms. for the houses constructed by the Tamilnadu Housing Board and the drainage is being maintained by ..... town panchayat. In order to ensure safe and hygienic disposal of sewage for the remaining areas, the panchayat proposes to undertake laying of an underground sewerage system within the town limits considering the requirement for the next 30 years and is calling for appropriate designs from consultants.

2. OBJECTIVE :

The objective of the consultancy is to analyze the technical feasibility, financial, economic, environmental and social aspects, prepare detailed design, drawings, cost estimates and bidding documents for planning and implementation of a sewerage scheme for ..... for the effective handling of sullage and the sewage generated

3. SCOPE OF WORK :

The scope of work of the consultants includes necessary surveys and investigations needed to undertake the work. The scheme would address the necessity of ..... town panchayat, covering an area of 63 kms. The overall design would cater for a period of over 30 years and a population as determined by the consultant based on appropriate projection techniques. The suggested technology for sewage treatment shall be simple and appropriate to the operation and maintenance needs of the town panchayat. The designs shall conform to relevant latest applicable Indian Standards, pollution control board norms and CPHEEO manual. Wherever such standards are not available, appropriate standards shall be followed in discussion with the client.

4. CONSULTANT RESPONSIBILITY:

The Consultants responsibility would include:

Survey Investigation & Concept Feasibility:

Data : The details given in the technical conditions and specifications taken in conjunction with the study, is only a reasonable preliminary basis. The nature of the overall contract is such that after the proposal, the consultant shall be wholly responsible for all the details of the proposal, the physical and site conditions, the execution methodology etc. All data utilized in preparation of the proposal shall be presented indicating the sources of the data and also the basis of assumptions, if any. The consultant shall be responsible for all the data or designs and drawings given by them.

Project Site Survey and Analysis : The consultant shall conduct his own studies and prepare estimates based on schedule of rates. The Tamilnadu Urban Infrastructure Financial Services Limited (TNUIFSL) as well as the local body concerned shall not be responsible (except as to risks specifically accepted under the conditions of contract) for the validity of the project details and designs and estimates. The consultants shall be responsible for this.

Survey : The local body shall indicate the Project sites and their measurements. The consultant shall be responsible for its verification.

Soil Investigation and Tests :

Soil tests are to be carried out as per relevant I.S. / IRC Standards to arrive at design parameters for the formation and relevant applicable safe bearing capacities. At locations proposed for important installations like pump house, aeration tanks etc.., atleast one borehole for every such installation should be made, to determine the SPTN values at depth specified in the relevant IS codes. Soil samples taken from bore holes should be visually classified with index properties determined and presented alongwith the final report. These bore holes should normally be taken to a depth whose 'N' value is greater than 100 plus 3 m (to account for any drastic fall in 'N' value below this strata). The subsurface water at each borehole should be sampled and a chemical analysis carried out, to recommend appropriate cement mixture ratios for use in the foundations. Recommendations of a geo technical expert should be furnished in the soil report. It should cover aspects like appropriate soil stabilisation measures if required.

Detailed Designs & Cost estimates :

Project Designs : For the given purpose and functional use of the respective projects, proper design has to be developed. The consultants have freedom to choose the type of sub structure and superstructure, provided code specification / CPHEEO stipulations are met. The drawings and designs shall include a general arrangement drawing and a detailed longitudinal section drawings of all components in size A1 or A2. The level of detailing shall be such so as to enable check of conformance with code provisions, including detailed construction drawings and bar bending schedules.

Estimation of Quantities : Based on the surveys and designs evolved by the consultants, within the framework and the requirements of the project, the consultants have to prepare detailed item and quantity schedules and work out the cost estimates.

Tender. : Preparation of tender, in the Asian Development Bank prescribed format. Providing assistance to issue of tender documents, conducting pre-bid meetings, evaluation of tender, award of work.

As regards computer, the consultant may adopt appropriate application software packages wherever possible for ultimate use of the client.

5. TASKS TO BE PERFORMED :

(i) Study the existing sewerage scheme and any plans prepared by the municipality. Prepare feasibility analysis, preliminary and detailed design, drawings and estimate, including bill of quantities after conducting necessary investigation study, for the underground sewerage system in the town.

(ii) Survey the area and drawing up of a contour map.

(iii) The consultants are required to divide the town into sewerage zones based on levels and indicate the hierarchy of the drain system with their locations. The design should cater to all stipulated norms and must be the most cost effective.

(iv) Design of sewer lines, Main pumping station, Relay pumping station if required, treatment and disposal methods. Identify the extent of coverage to poorer segments of the population depending upon location, kind of habitation (eg. Slum areas) and type of coverage (individual households, or community coverage) and make provisions for low cost sanitation facilities wherever deemed fit.

(v) The consultants are given the following options to be studied and designed, with respect to the sewerage treatment plant –

a. To take the waste and sullage water to the sewerage treatment plant located in Nesapakkam.
b. Locate a suitable place for construction of STP, which shall be common for ....., ... and Ramapuram town panchayats.
c. Study the literature pertaining to the Bio-reactor Membrane Technology, where the land requirement is considerably less than the conventional technologies.

The consultants are required to study and weigh the various options, and give their opinion on various grounds.

(vi) The consultants are required to prepare project cost estimates and also indicate relevant operation and maintenance Costs. Based on this, the consultants are required to prepare project financial and economic analysis including International rate of return / Economic rate of return of the project. Justify the assumptions made with illustrations that are implemental.

(vii) Estimation of sewer connection charges and the monthly tariff to be collected from the residents along with annual indexation for hike in tariff / connection charges.

(viii) Prepare environmental and social assessment report as per the ESR guidelines developed by TNUIFSL and prepare necessary Environmental Management plans (EMP) or Resettlement Action Plans (RAP). The EMP may contain suggestion for types of farm forestry to be developed using the treated effluent finding its way to any watercourse or water bodies. Fodder grass farming is to be avoided as it is recycled to sewer system. The RAPs shall address rehabilitation and resettlement issues, if any.

(ix) Detailed working drawings and designs are to be furnished with specifications.

(x) Prepare detailed cost estimates based on item rate basis using the latest schedule of rates. Estimate necessary road restoration charges wherever needed. Assist the Municipality in getting administrative / technical sanction for the scheme from competent authorities. There should not be any lumpsum items in the bill of quantities. For items not covered under schedule of rates, market rates to be assessed.

(xi) Prepare tender documents based on the Asian Development Bank model documents, assist the client in call for bids, co-ordinate pre-bid meetings, evaluate bids, scrutinize and prepare comparative statement with recommendation for issue of work order to contractor after due approval.

(xii) Finalise contract agreement to be signed by the contractor. Draw up project budget with monthly targets, furnish network analysis such as CPM/PERT for purposes of effective project monitoring and regular reports.

(xiii) To prepare the project implementation schedule for execution and contract packaging plan.

(xiv) Recommend organisational set up for operation and maintenance of the system. Identify any training requirements of staff along with costs.

(xv) Involve the Engineer / commissioner of Municipality at all stages.

6. DATA, SERVICES AND FACILITIES TO BE PROVIDED BY THE CLIENT

a. The maps and other data related to this work, to the extent available in the town panchayat office will be provided.
b. Detailed drawing of the present water supply system will be provided by the town panchayat.

7. SCHEDULE OF COMPLETION OF TASKS

a.	Inception report	30 days
b.	Interim report – feasibility analysis and preliminary design	60 days
c.	Draft design and estimate	120 days
d.	Final detailed design and estimate	150 days
e.	Draft bid document	165 days
f.	Final bid document	180 days

8. TERMS OF PAYMENT

(vi) 10% of Contract value on submission and acceptance of Inception Report

(vii) 25% of contract value on submission and acceptance of Interim report, consisting of feasibility analysis and Preliminary designs on alternative cost effective proposals

(viii) 35% on submission and acceptance of draft designs and estimates.

(ix) 20% of contract value on submission and acceptance of Final designs and estimates and draft bid documents.

(x) 10% of the contract value after technical sanction from competent authority and submission of final bid document.

9. Final Outputs (i.e. drawings, reports etc.,) that will be required of the consultant:

b. Inception report: General discussion about present distribution U.G. system and macro level details.

b. Interim report: Feasibility analysis and preliminary design based on specs of para 6 of TOR, including alternate cost effective proposals.

c. Draft Final Report: Draft design & cost estimate based on spec indicated in para 6 of TOR.

h. Final Report: Final detailed design along with flow chart, drawings and cost estimates.

i. Draft Bid Document.

j. Final Bid document.

k. ESR & EMP reports.

l. Bid Evaluation Reports.

m. Project implementation plan containing project budget, network and analysis, package plan with implementation schedule and organizational setup.

The consultant would be required to submit five copies of each of the reports except final bid document for which he shall submit 10 copies besides provide a soft copy of the final project report, other reports and Auto CAD drawings.

10. Composition of Review Committee to monitor Consultant's work:

a. Executive Officer, ... Town Panchayat

b. Representative of Directorate of Town Panchayats, Chennai

c. Representative of TNUIFSL

d. Representative from CMWSSB.

11. Procedure for review of progress reports.

The review committee will review the progress of the work. The decision / suggestion carried out will be reviewed in the next meeting. The comments or views on the various reports should be given to the consultant within 7 days of submission

12. List of key professional positions whose CV and experience would be evaluated:

S. No.	***Key Professional***	***No. of Persons***	***Experience***
1.	Project Manager	1	A graduate in Civil Engineering with about 15 years experience in designing Under ground sewer projects ***<u>including</u>*** ***<u>sewage treatment plants</u>*** including laying of Sewer lines,

			provision of valves, selection of pumps.
2.	Project Engineer (Civil)	1	A graduate in Civil Engineering with about 10 years experience in the field mentioned above.
3.	Project Engineer (Electrical / Mechanical)	1	A graduate in Electrical / Mechanical Engineering with about 10 years experience in selection and installation of pumps, electrical panel boards etc and erection works.
4	Financial Specialist	1	A finance specialist with about 5 year experience with adequate exposure to municipal financial analysis

Other persons should support the above team especially by environmental and social specialists to ensure that these safeguards are complied with.

V. Model TOR for Concrete Roads project prepared for a town in Tamil Nadu

TERMS OF REFERENCE

1. BACKGROUND:

Chennai one of the four major Metropolitan cities today in our country was a fisherman hamlet four centuries ago. Today is the hub of industrial, commercial, educational, recreational, cultural and other various activities. Also with a major seaport and airport, it is a major Metropolitan city in the southern part of our country.

Corporation of Chennai is the premier civic body in India. It is to be the pride of the citizens of Chennai that the " Corporation of Madras" was inaugurated on 19th September 1688 under the Royal Charter of the Emperor of England. Ever since the inception, the Corporation of Chennai has been attending to the civic needs of the citizens viz., Roads, Storm Water Drain, Street Lighting, Schools, Market, Conservancy, Public Health, Mother & Child Health, Sanitation etc.

Corporation of Chennai is maintaining 222 km. Length of Bus Route Roads and 2475 km length of interior roads and nearly 80 km length of Corporation Bus Route Roads have been taken over by Highways and is being currently maintained by them.

Corporation of Chennai has been attending the repairs, relaying and improving the roads in Chennai City to make the roads in motorable condition for the road users.

In view of the growth of population and activities of people, the growth of vehicles has increased many fold in the recent years. High rise buildings are also being constructed in various parts of the city. It also leads to increase in volume of traffic. Now a days, Chennai City has become International Business Centre.

World players of Information Technology have also came to Chennai and started business in Chennai City. To cope up with the requirement of International players, road infrastructure facility has to be raised to International standard.

2. NEED OF THE PROJECT:

As a measure of improving the infrastructure facilities in Chennai City, special attention has been given for the improvement of Bus Route roads and Interior roads. Some of the Bus route roads are plying near Metro Water filling stations and the existing bituminous road surface get damaged due to continuous movement of water tankers which spills water and the problem is further compounded due to movement of heavy vehicles. As a permanent measure to prevent the damages to the road often, there is absolute need to convert these roads as rigid pavement (i.e) Cement Concrete Surface. There are certain other roads where containers ply. The exisiting roads are not designed to these wheel loads and road surface gets damaged.

3. An outline of the tasks to be carried out (Scope of the services)

The consultant shall be required to carry out the following:

a) The soil analysis should be carried out in all the roads as per IRC and MOST to ensure minimum redundancy in the bill of quantities.
b) The consultant shall be required to carry out investigation and prepare Project Report. The report should contain justification of the proposal, detailed working drawing etc. The design data calculations should also be available in the report. All the design should be as per the IRC and MOST guidelines. The consultant shall be responsible for all the data or designs and drawings given by them. Corporation of Chennai shall not be responsible for the project detailss and design and estimates.
c) The consultant shall be required to prepare detailed bill of quantities and detailed bidding documents as per Asian Development Bank Format. The bill of quantities and technical specification should be prepared as per the Corporation schedule of rates. The bidding document should contain all the conditions to facilitate the faster completion of cement concrete roads.
d) Shifting of all service line to the edge of the road by constructing duct shall be incorporated.
e) Provision for draining Rain water proposals, Storm Water Drain, spillage water by incorporating new Storm Water Drain or suitable side drain to drain storm water and spillage water on the either side of the road.
f) Adequate provision shall be made for footpath in these roads wherever possible.
g) The departmental Engineers shall scrutinize the proposal furnished by the consultant. The consultant should modify alter or completely change the proposal to the satisfaction of the Departmental Engineers. The consultant shall prepare for the accepted proposal detailed pavement design.

4. Schedule for completion of tasks:

Within 30 days from the date of issuing work orders.

5. Data, Services and Facilities to be provided by the client

a) Details of road such as Location, length & width, position of service lines, storm water drain etc. The consultant shall be responsible for its verification.
b) Schedule of rates to be adopted in the bill of quantities.

6. Final outputs (i.e. Reports, Drawing etc.) that will be required of the consultant:

a) Detailed Project report, Bill of quantities, Draft bid document as per Asian Development Bank format.

b) Final detailed project report, Bid documents and technical specifications.

7. Composition of Review Committee to monitor consultants work

i) Advisor, TNUIFSL.
ii) Deputy Commissioner (Works), Corporation of Chennai.
iii) Chief Engineer (General), Corporation of Chennai.
iv) Manager (projects), TNUIFSL
v) Superintending Engineer (BRR), Corporation of Chennai.

8. Procedure for review of Progress Reports, Inception Status, Final Draft & Final Reports.

The work will be reviewed at every stage. The inception report containing the detailed work plan and interim report will be submitted by the end of second week from the date of commencement. After this, a draft final report incorporating changes will be submitted at the end of third week. The Review committee will meet formally at every stage of submission to review the progress of work and approvals to proceed with the next stage of work will be given within 3 days. The final detailed project report and bid documents will be submitted within one month's time.

9. List of key professionals, positions whose CV and Experience would be evaluated.

i) Soil Analyst.
ii) Structural Engineer.
iii) Project Engineer (Civil).

VI. Model TOR for Bus Stands project prepared for a town in Tamil Nadu

Terms of Reference

Consultancy for Improvement of Christopher Bus Stand in Nagercoil

Background

Nagercoil town, the headquarters of Kanyakumari District is a selection grade municipality. The town spread over an area of 24.29 sq, kms. with a population of 190084 as per 2001 census. The town is served by three bus terminals viz. Christopher Bus stand in Vadasery on Balamore Road. Anna Bus stand on Cape Road (Urban Stretch of NH 47) and State Express Transport Corporation bus stand on Police Station Road in Meenakshipuram. Christopher Bus stand is a 'B' class Bus stand constructed in the year 1994 by reclaiming and developing a portion of Perumalkulam (Tank). This bus stand provides for 46 bus bays for parking of buses and about 200 buses are presently using the facilities. During the rainy season the bus stand is filled with rainwater, which hamper the functioning of the bus stand. The concourse pavement gets damaged frequently.

Nagercoil Municipality has proposed to improve / strengthen concourse pavement and improve the drainage system to prevent rainwater stagnation during rainy season.

Objectives:

To mitigate the problem of the Bus stand getting flooded due to lack of proper storm water drainage facility, is proposed to provide improvements of civil structures and make the Bus stand functional throughout the year. The solution to the problem should end up with a capital investment in civil works for improvement and for periodical maintenance by the local body.

2.1 Scope of Work:

(iv) the design of drainage system should cover draining of flood water from the Bus stand to a location for ultimate discharge without causing flooding in downstream areas. Hence the comprehensive study if needed, suggested in this respect is to identify the additional land requirement and the cost effective structured drain course for discharge. It should be ensured that the Bus stand floor is always on a higher plan than the level of roads such that the drainage system should not be a relief measure for draining the flood water from future road levels into the bus stand.

Tasks

Detailed investigation to determine the condition of the existing pavement, (the nature and quality of the existing pavement layers) and the quality of the underlying in-situ sub-grades
Condition and adequacy of the existing drainage system
Design of suitable pavement and drainage system
Preparation of detailed project report
Preparation of tender documents

Inputs to be provided by the client

Site map with reduced levels of the bus stand
Details of the existing pavement crust
Earlier project reports available

Time Schedule

Inception Report – 20 days from the date of Contract
Preliminary Detailed Project Report – 75 days from the date of Contract
Preliminary Tender Documents – 75 days from the date of Contract
Final Detailed Project Report & Tender Documents – 90 days from the date of Contract

Payment Schedule

1.	Mobilisation Payment	15%
2.	Submission of Primary Detailed Project Report	30%
3.	Submission of Tender Documents	30%
4.	Submission of Final Detailed Project Report	15%
5.	Submission of Final Tender Documents	10%

Submission of Reports

The consultant would be required to submit five hard copies of each of the reports at the various stages besides provide a soft copy.

Review Procedure

A Committee would review the consultants' work at each stage. The Committee would sanction approvals for each of the reports within seven days from the date of submission to them. The committee would comprise representative of the following:

Commissioner for Municipal Administration
Nagercoil Municipality
TNUIFSL

ANNEX 3: ENVIRONMENTAL ASSESSMENT AND MITIGATION MEASURES

Environmental assessment is done to maximize the positive environmental impact of the subproject. Environmental assessment of a water supply subproject, for example, is to maximize environmental benefits by way of (i) improved drinking water quality through improvements in water supply; (ii) reduced depletion of water resources through improving the management of existing water supply schemes; (iii) improved surface and ground water quality through drainage and solid waste management; and (iv) reduced flood through drainage. In case of road subproject it will help to know if the subproject will result in reduced air pollution from improving roads. In the case of institutional infrastructure, it will help understand if the subproject will help in improved health and increased social benefits from developing institutional infrastructure such as health, education, common community facilities, and administrative facilities. A table on subproject activities and their potential impacts on environment is outlined in table 1.

The tentative environmental impacts in the parlance of ADB are summarized in the following table no. 2

Table 1: Subproject Activities and Potential Impacts on Environment

Activity	Potential Negative Impacts	Severity	Duration
Water Supply			
Pre-Construction Phase	Noise and dust during field investigations	N	T
Construction Phase	Silt and sedimentation, and water quality impairment	N-M	T
	Traffic congestion during road excavation, damage to roads, generation of spoil and issues with spoil disposal, noise, and dust	N	T
	Impacts on habitats, land acquisition and resettlement.	N-M	P
Post Construction Phase	Conflicts between water users	N-S	P
	Lowering of water table due to groundwater withdrawal	N-S	P-Seasonal
	Generation of sludge and sludge disposal	N	P
Roads			
Pre-Construction Phase	Noise and dust during field investigations	N	T
Construction Phase	Silt and sedimentation, and water quality impairment	N-M	T
	Traffic congestion during road works	N	T
	Noise and dust	N-M	T
	Impact on trees	N-M	P
	Impacts due to new rock quarries, sand mining sites, and new borrow areas	M-S	P
Post Construction Phase	Increased emissions	N	P
	Road accidents, and oil and chemical spills	N	T
Solid Waste			
Pre-Construction Phase	Significant impacts are not expected		
Construction Phase	Silt and sedimentation, and water quality impairment	N-M	T
	Traffic congestion during works, generation of spoil and issues with spoil disposal, dust, and noise	N	T
		N-M	P

Activity	Potential Negative Impacts	Severity	Duration
	Land acquisition and resettlement		
Post Construction Phase	Water pollution due to leachate, fly and rodent infestation, odour and negative visual impacts and consequent reduction in surrounding land values	S	P
Drainage			
Pre-Construction Phase	None expected		
Construction Phase	Silt and sedimentation, and water quality impairment Traffic congestion during works, generation of spoil and issues with spoil disposal, noise, and dust	N-M N	T T
Post Construction Phase	Impacts due to discharge of polluted waters Siltation in canals	N-M M	P P
Municipal			
Pre-Construction Phase	None expected		
Construction Phase	None expected		
Post Construction Phase	Disposal of waste and wastewater	N	P

N - Negligible, M - Moderate, S - Severe, T - Temporary, P - Permanent

Table 2: Tentative Environmental Mitigation Measures

Potential Negative Impacts	W	R	SW	D	Mitigation Measure	W	R	SW	D	Responsibility	W	R	SW	D
Pre-Construction Phase														
Noise and dust during field investigations	√	√			Best practices will minimize impacts.	√	√	-	-	Consultants/ Contractor	√	√	-	-
Significant impacts are not expected			√											
None expected				√										
Construction Phase														
Silt and sedimentation, and water quality impairment	√	√	√	√	Water from construction activities will not be directly disposed into water bodies. Adequate silt arresting measures such as silt barriers will be provided if necessary. Proper drainage interceptors will avoid runoff entering construction area. Construction waste will not be disposed into water bodies.	√	√	√	√	Contractor	√	√	√	√
Traffic congestion during road excavation, damage to roads, generation of spoil and issues with spoil disposal, noise, and dust	√	√		√	Construction material will be stockpiled to minimize traffic blockage. In case of excavation in busy streets, adequate arrangements will be made for traffic diversion.	√	√		√	Contractor	√	√		√
					Alternative routes to be selected based on existing traffic flow of those routes		√			Contractor		√		
					Early information will be provided to affected persons, work sites will be pre-planned to avoid inconvenience,	√	√	√	√	Contractor	√	√	√	√

Potential Negative Impacts	W	R	SW	D	Mitigation Measure	W	R	SW	D	Responsibility	W	R	SW	D
					and temporary barriers and warning signs will be provided.									
					Qualified contractors to be appointed. Contracted work includes implementation of site management plan including spoil disposal.	√	√	√	√	Contractor	√	√	√	√
					Spraying water and other best practices to arrest dust will be employed. Noise generated from equipment will be checked. High noise generation activities will be avoided during evenings.	√		√	√	Contractor	√		√	√
Noise and dust		√			Spraying water and other best practices to arrest dust will be employed. Noise generated from equipment will be checked. High noise generation activities will be avoided during evenings.		√			Contractor		√		
Impact on trees		√			Where possible the design will minimize removal of trees. In addition, replanting new trees in the vicinity of the initial location will be observed.		√			Contractor		√		
Impacts due to new rock quarries, sand mining sites, and new borrow areas		√			Rock quarries, sand mining sites, and new borrow areas will be restored to original condition and re-vegetated.		√			Contractor		√		
Impacts on habitats, land acquisition and resettlement.	√				Impacts on habitats to be covered by site management plan. Land acquisition and resettlement to be covered by a resettlement plan.	√				Contractor/LA	√			

Potential Negative Impacts	W	R	SW	D	Mitigation Measure	W	R	SW	D	Responsibility	W	R	SW	D
Impacts on habitats, land acquisition and resettlement.	√				Impacts on habitats to be covered by site management plan. Land acquisition and resettlement to be covered by a resettlement plan.	√				Contractor/LA	√			
Land acquisition and resettlement			√		Land acquisition and resettlement to be covered by a resettlement plan.			√		Contractor/LA			√	
Post Construction Phase														
Conflicts between water users	√				Consultation	√				Facility Operator/Subproject Consultants/LA	√			
Lowering of water table due to groundwater withdrawal	√				Establish (through study) aquifer water replenishment rates and limit extraction to recharge	√				Operator/Subproject Consultants/LA	√			
Generation of sludge and sludge disposal	√				Safe sludge handling methods to be employed. Sludge management plan will be prepared	√				Operator/Subproject Consultants/LA	√			
Increased emissions Road accidents, and oil and chemical spills		√			The impacts due to increase in traffic are unavoidable. However, long-term measures such as promoting better fuels may address this issue. Higher speed can also offset increased emission from increased vehicular traffic. Accidents will be avoided through proper signage.		√			Contractor/LA		√		
Water pollution due to leachate, fly and rodent infestation, odour and negative visual impacts and consequent reduction in surrounding			√		Ensure proper maintenance of the system. Ground water quality in surrounding areas will be monitored. Design may require clay lining and multilevel construction.			√		Facility Operator/Subproject Consultants/LA			√	

Potential Negative Impacts	W	R	SW	D	Mitigation Measure	W	R	SW	D	Responsibility	W	R	SW	D
land values														
					Open dumping in and around the facility will be avoided. Provide immediate soil cover over waste. Greenbelt developed around the site			√		Facility Operator/Subproject Consultants/LA			√	
Impacts due to discharge of polluted waters				√	Ensure no entry of wastewater/sewage into drains				√	Subproject Consultants/LA				√
Siltation in canals				√	Ensure clearing of debris/waste and material				√	Subproject Consultants/LA				√

ANNEX 4: SUB LOAN APPLICATION FORM

Contents of Sub loan Application Form

The sub-loan application form of NCRPB is framed in such a way that it contains all information required for the appraisal in a consolidated manner and also in a user-friendly manner to the borrowing agencies. To start with, a simple loan application form is suggested, for the ULBs/ Statutory Boards to catch up to some elevation from the present stage, which could then be further expanded by NCRPB as necessary. A model sub-loan application form, common for all projects is given below.

The loan application also provides the environmental and social screening forms, which will be used when multilateral funding is involved. In the light of ADB financing being envisaged, this form could be very useful for appraising the environmental and social aspects of a project. These forms may not be used at present, when NCRPB's own funds are lent. A model loan application form is given below.

FORM 1: APPLICATION FOR LOAN

1.	**Name of Borrower**	**:**	
2.	**Address/Tel. No.(With STD CODE)** **E Mail address**	**:**	
3.	**Type of Project**	**:**	
4.	**Location**	**:**	
5.	**Population – 2001 Census**	**:**	
6.	**Project Duration**		
	(a) Probable Date of Commencement	**:**	
	(b) Probable Date of Completion	**:**	
7.	**Progress already made if any**		
	(a) Physical Progress (in % terms)	**:**	**……%**
	(b) Financial Progress	**:**	**Rs. ……. Lakhs**
8.	**(a) Project Cost (excluding Land cost)**	**:**	**Rs. ……. Lakhs**
	(b) Land Cost, if any	**:**	**Rs. ……. Lakhs**
9.	**Means of financing (Rs. in Lakhs)**		
	(a) Loan from NCRPB	**:**	**Rs. ……. Lakhs**
	(b) Grant, if any	**:**	**Rs. ……. Lakhs**
	(c) Equity Contribution by borrower	**:**	**Rs. ……. Lakhs**

10. List of documents to be enclosed

a) Detailed accounts for past 5 years (Income Expenditure, Balance sheet and DCB)
b) Loan Outstanding statement as on Date (Please Fill in Document 6)
c) Detailed Estimate of Items to be Purchased/Procured/Constructed
d) Government approval for the scheme availing NCRPB Loan
    - Administrative Sanction
    - Technical Sanction
e) Council/Board Resolution authorizing Local Body/statutory boards to raise loan from NCRPB
f) Environmental/Social data sheet if applicable (Please Fill in Document 1 and Document 2)

Signature :
Name :
Seal :

Document 1

ENVIRONMENTAL SCREENING FORM
PART A [To be prepared by the borrower for each Sub-project loan]

Name of Applying Urban Local Body:
Name of the Sub-component:
Name of Sub-project:
Geographical areas covered by Sub-Project :
Name of Line Department/Organization Responsible:
Name and address of Officer responsible:

1. Does the Sub-project is adjacent to: Please √ in one box

i)	Cultural Heritage site	Yes		No	
ii)	Protected Area	Yes		No	
iii)	Wet Land	Yes		No	
iv)	Mangrove	Yes		No	
v)	Estuarine Region	Yes		No	
vi)	Other SECs as listed in ESF	Yes		No	

2. Does the proposed sub-project could cause negative impacts on: Please √ in one box

i)	Surrounding Environmental Conditions	Yes		No	
ii)	Degradation of land / eco-systems	Yes		No	
iii)	Loss or impacts on Cultural / heritage properties	Yes		No	
iv)	Occupation of low lying lands / flood plains, etc.	Yes		No	
v)	Water Resource Problems	Yes		No	
vi)	Air / Noise Pollution	Yes		No	
vii)	Pollution of Water bodies / ground water	Yes		No	
viii)	Cutting of Trees / Loss of Vegetation	Yes		No	
ix)	Health & Safety Risks in the neighbourhood	Yes		No	

x) Constriction hazards to workers / residents Yes ☐ No ☐

xi) Release of toxic gasses or accident risks Yes ☐ No ☐

3) Any other features of the projects that could influence ambient environment

_____ _____

Date **Signature and Name of the Officer responsible**

Environmental Screening Sheet must be completed by all Urban Local Bodies/Government Departments applying for a loan from NCRPB

Document-2

SOCIAL SCREENING FORM

PART A [To be prepared by the client of NCRPB for each Sub-project loan]

Name of Applying Urban Local Body:

Name of the Sub-component: Roads and Bridges

Name of Sub-project:

Geographical areas covered by Sub-Project :

Name of Line Department/Organization Responsible:

Name and address of Officer responsible:

1. Does the Sub-project involve: Please √ in one box

i)	Acquisition of homestead land	Yes		No	
ii)	Acquisition of private "patta" land	**Yes**		**No**	
iii)	Acquisition of village "poramboke" land	Yes		No	
iv)	Alienation of any type of Government land other than its own department	Yes		No	
v)	Transfer of land	Yes		No	
vi)	Clearance of encroachments from land	Yes		No	
vii)	Clearance of squatting from Government/ Urban Local Body Land	Yes		No	

2. Does the proposed sub-project adversely affect: Please √ in one box

i)	Any type of sources of livelihood	Yes		No	
ii)	Any type of homes/structures	Yes		No	

3. ***PART B [If any of the above is 'Yes', provide approximate information required below]***

i)	Number of households to be acquired	
ii)	Number of structures, both authorized and/or unauthorized to be acquired/cleared	
iii)	Number of households to be displaced	

iv) Acres of "patta" land to be acquired ☐

v) Acres of Government land to be alienated ☐

vi) Acres of land to be transferred ☐

vii) Details of village common properties to be alienated

Pasture land (acres) ☐

Cremation/burial ground ☐

Others - specify ☐

viii) Number of encroachments to be cleared ☐

Number of persons affected ☐

ix) Number of squattings to be cleared ☐

Number of persons affected ☐

4. Adversely affected sources of livelihood: Please √ in all applicable boxes

Loss of Agricultural Land ☐ Loss of Grazing ☐

Vegetable/Fish/Meat vending ☐ Petty Shops ☐

Cycle repair shop ☐ Garage ☐

Loss of access to forest produce (NTFP) ☐ Tea stalls ☐

Any others - specify. ☐

5. Approximate number of persons affected ☐

Acquisition of homestead land ☐

Acquisition of "patta" land ☐

Petty shops ☐

Vendors ☐

Cycle repair shops ☐

Garage ☐

Tea stalls ☐

Loss of grazing ☐

Loss of access to NTFP ☐

Others including community assets/temples etc. (Specify) ☐

Date **Signature and Name of the Officer responsible**

1. Social Screening Sheet must be completed by all Urban Local Bodies/Government Departments applying for a loan from National Capital Regional Planning Board (NCRPB) for any sub-project involving land; and
2. Social Screening Sheet must also be completed when project activity involves acquisition of private "patta" land, alienation of any Government land under different tenure system including "Poramboke" land "owned" by the Urban Local Body or any other Government institution/department/organization which are alienated in favor of project activity, when encroachments/encroachers are cleared and when community assets such as places of worship, burial/cremation grounds etc. are required to be cleared for the execution of project activity.

POSSIBLE ENVIRONMENTAL AND SOCIAL ISSUES IN INFRASTRUCTURE PROJECTS

Infrastructure projects aim to improve the standard of living within the project area and hence have associated positive impacts. However, possible negative impacts of infrastructure projects are as shown below:

Project	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I) Water Supply & Sewage																
A. Water Supply																
1. Water supply lines & taps		ν		ν					ν							
2. Water tankers		ν		ν	θ				θ			ν				
3. Overhead tanks	θ														θ	
4. Water treatment plants	ν			ν				ν				ν			θ	
5. Head works						θ									θ	
6. Generators					ν	ν										
7. River Intake works		ν	θ					ν								
B. Storm water Drainage																
1. Open drains	ν		ν	ν					ν			ν	ν			
2. Closed/Underground drains	ν		ν						ν							
C. Sewerage / Sanitation																
1. Public conveniences		ν	ν	ν			θ						ν		θ	
2. Pay & use latrines		ν	ν	ν			θ						ν		θ	
3. Sewage network								o								
4. Pumping Station						ν	ν				ν				o	ν
5. Sewage treatment Plants	ν	ν	ν	ν			ν					θ	ν		θ	
6. Septic tanks		ν	ν	ν									ν		θ	
II. Solid Waste Management																
A. Land fill site	ν	ν	ν	ν	θ		ν					ν	ν		ν	
B. Compost Yard					θ	θ										
C. Collection / Transportation					o											
III. Transportation																
A. Roads																
1. Widening of roads	θ				ν	ν		ν	ν	ν					θ	
2. Improvement of surface					θ				ν							
3. New roads		ν			ν	θ		ν	θ						ν	
4. Traffic islands		ν				θ			ν	θ						

Project	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
5. Road divider		ν				θ			ν	θ						
6. Footpaths	ν	ν						ν	ν	θ						
B. Street Furniture																
1. Traffic signals					ν	ν			ν							
2. Street lights									ν							
3. Sign boards									ν		θ					
C. Road Structures																
1. Subways																
- Pedestrian	ν	ν		ν					θ	θ					θ	
- Cycle	ν	ν		ν					θ	θ					θ	
- Fast moving	ν	ν		ν					θ	θ					θ	
2. ROBs	ν	ν							θ						θ	
3. Culverts		ν							θ							
4. Small Bridges		ν							θ						θ	
D. Terminals / Shelters																
1. Bus Shelters					θ	θ			ν						θ	
2. Bus Terminals/Stands					θ	θ			ν	ν					θ	
3. Truck Terminals					θ	θ			ν	ν					θ	
4. Workshops					θ	θ			ν						θ	
5. Carparking Complexes	ν				ν			ν	ν	ν					θ	
E. Fleet Expansion					ν	ν				ν			ν			
F. Construction & Maintenance equipment					θ	θ										
G. Inland Water Ways	ν	ν	ν												ν	
IV. Commercial Complexes																
A. Shopping/office complexes							ν							θ	ν	
B. Vegetable/Fish markets							ν			θ					ν	
C. Slaughter houses							ν					ν	ν		ν	
D. Marriage halls		ν					ν			ν					ν	
E. Lodge / Dormitory															ν	
F. Municipal community complexes		ν					ν	ν	ν	ν				ν	ν	
V. Non Commercial/Community Amenities																
A. Parks	ν	ν													ν	
B. Playgrounds	ν	ν													ν	
C. Maternity and Child center							ν								ν	
D. Hospitals						θ	ν			θ		θ			ν	
E. Educational Institution/ Reading rooms								ν							ν	

Project	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
F. Burial Grounds		ν									ν	ν	ν		ν	
G. Electric crematoriums			θ		ν										ν	
VI. Integrated Area Development																
A. Housing (Sites& Services)	ν	ν					ν	ν	ν	ν				ν	ν	
B. Guided Urban Development	ν	ν					ν	ν	ν	ν				ν	ν	
C. TRAMP	ν	ν						ν	ν	ν				ν	ν	

1: Landuse change
2: Hydrology and Drainage Patterns
3: Surface and Ground Water Quality
4: Water Logging
5: Air Quality
6: Noise
7: Solid Waste
8: Destruction of habitat/ Vegetation
9: Disturbance to Other Services
10: Urban Congestion
11: Urban Aesthetics
12: Public Health and Safety
13: Smell and Smoke
14: Fire Hazards
15: Resettlement and Rehabilitation
16. Insect menace

Note

ν **Major Negative Impact**

θ **Minor Negative Impact**

GUIDELINES FOR ENVIRONMENTAL CATEGORISATION OF INFRASTRUCTURE PROJECTS

Project	Environmental Category
I) Water Supply & Sewage	
A. Water Supply	
1. Water supply distribution lines	E-3
2. Water tankers	E-3
3. Overhead tanks	E-3
4. Water treatment plants	E-1
5. Head works	E-3
6. Generators	E-3
7. River Intake Works	E-1
B. Storm water Drainage	
1. Open drains	E-2
2. Closed / Underground drains	E-2
C. Sewerage / Sanitation	
1.Only Sewer Net Work[3]	E-2
2.Sewerage Network and Pumping Stations[5]	E-2
3.Sewerage Network, Pumping Station and Treatment Plant	E-1
4.Public conveniences	E-2
5.Pay & use latrines	E-2
6.Septic tanks	E-2
II) Solid Waste Management	
A. Landfill Sites	E-1
B. Compost Yard	E-1
C. Solid Waste Mgmt, including Collection & Transportation Vehicles	E-2
III)Transportation	
A. Roads	
1. New Roads	E-1
2. Widening of roads outside ROW	E-1
3. Widening of roads within ROW in Environmental Sensitive areas	E-1
4. Widening of roads within ROW without Environmental sensitive areas	E-2
5. Improvement of surface	E-3
6. Traffic islands	E-3
7. Road divider	E-3
8. Other Traffic and Transport Management measures	E-3
9. Foot paths	E-3

[3] Projects without adequate treatment and disposal facilities (meeting the requirements of TNPCB or other applicable laws) to cater to the sewage generated due to the extension of sewerage system or network shall be categorised as E1.

Project	Environmental Category
B. Street Furniture	
1. Traffic signals	E-3
2. Street lights	E-3
3. Sign boards	E-3
C. Road Structures	
1. Subways	
- Pedestrian	E-2
- Cycle	E-2
- Fast moving	E-2
2. ROBs	E-2
3. Culverts	E-2
4. Small Bridges	E-2
D. Terminals / Shelter	
1. Bus Shelters	E2
2. Bus Terminals/Stands	E-2
3. Truck Terminals	E-2
4. Workshops	E-2
5. Parking Complexes	E-3
E. Fleet Expansion >100 buses	E-2
<100 buses	E-3
F. Construction & Maintenance equipment	E-3
G. Inland Water Ways / Lakes / Water Bodies	E-2
IV.Commercial Complexes	
A. Shopping /Office complexes (for < 1000 persons or with a sewage discharge < 50,000 litres per day)	E-3
B. Shopping /Office complexes (for > 1000 persons or with a sewage discharge > 50,000 litres per day)	E-1
C. Vegetable/Fish markets	E-2
D. Slaughter houses	E1
E. Marriage halls	E-2
F. Lodge / Dormitory	E-3
G. Municipal Community complexes complexes (for < 1000 persons or with a sewage discharge < 50,000 litres per day)	E-3
H. Municipal Community complexes complexes (for > 1000 persons or with a sewage discharge .> 50,000 litres per day	E-1
V.Non Comm./Community Amenities	
A. Parks	E-3
B. Playgrounds	E-3
C. Maternity and Child Centers	E-3
D. Educational institution/Reading Room	E-3
E. Burial Grounds	E-2
F. Electric Crematorium	E2

Project	Environmental Category
VI.Integrated Area Development	
A. Housing (Sites & Services)	E-1
B. Guided Urban Development	E-1
C. TRAMP	E-1
VII. General :	
A. Computer Facilities	E-3
B. Weigh Bridge	E-3

ANNEX 5: INITIAL SCREENING REPORT

ISR on the application of:					**Date of receipt of application:**
1. Type of Project	**:**				
Project Cost (Rs. in lacs)	**:**				
2. Loan Amount (Rs. in lacs)	**:**				
Grant Amount (Rs. in lacs)	**:**				
3. Location	**:**				
4. Debt: (as on date) (Rs. in lacs)	**:**	**Govt.**			
		FIs			
Overdues (as on date) (Rs. in lacs)		**: Govt.**			
5. Exposure	**:**				
(a) Borrower					
Total Exposure (including Proposed assistance):					
Sector	**:**				
(b) NCRPB					
Total Exposure (Including Proposed assistance):					
Sector	**:**				
% of net worth (NCRPB)	**:**				
6. Demand – Supply Gap	**:**				
7. Past Financials (Rs. in lacs)	**:**	**Year**	**Year**	**Year**	**Year**
Total Revenue (TR)	**:**				
Total Expenditure (TE)	**:**				
Surplus / Deficit	**:**				
% of TR/TE	**:**				
% of DS /TR	**:**				
% of O&M /TE	**:**				
Loans outstanding	**:**				

Interest	**:**				
8. Project Details, in brief	**:**				
9. Estimated Cost of Scheme: (Rs. in lacs)	**:**				
Land	**:**				
Site Development	**:**				
Construction / Supervision	**:**				
Technical Fees	**:**				
Environmental /Social Costs	**:**				
Preliminary & Preoperative expenses	**:**				
Contingencies	**:**				
TOTAL	**:**				
10. Means of Financing: (Rs. in lacs)	**:**				
Govt. - Loan **- Grant**	**:** **:**				
Institutions	**:**				
Others	**:**				
TOTAL	**:**				
11. Borrower's contribution as % of project cost	**:**				
12. Debt service coverage ratio (DSCR)	**:**				
13. Fixed Asset Coverage ratio (Only for private investors)	**:**				
14. Future Profitability Estimates (Rs. in lacs)	**:**	**Year**	**Year**	**Year**	**Year**
Total Revenue (TR)	**:**				
Total Expenditure (TE)	**:**				
Surplus / Deficit	**:**				
% of TR/TE	**:**				
% of DS / TR	**:**				

% of O&M /TE	**:**
Loans outstanding	**:**
Interest	**:**
15. Risks and Uncertainties	**:**
16. Environmental and Social Impacts	**:**
17. Recommendation	**:**

ISR prepared by:

ISR Approved by:

ANNEX 6: DETAILED APPRAISAL PROCEDURES

APPROACH

As outlined in the main manual, the approach of the appraisal procedure is to first conduct a subproject appraisal on a stand-alone basis, to ensure its self-sustainability. There are three scenarios which arise during appraisal:

- Projects that generate revenues to cover the costs and thus make the project sustainable;
- Projects that do not generate adequate revenues to cover the costs; and,
- Projects that may not generate revenues at all.

It is advisable to conduct a borrower's appraisal, in order to have safeguards of the loan. A detailed procedure of doing a project analysis and a balance sheet analysis is given in the following sections.

In the Indian context, there are very few cases where projects have completed on time. Invariably cost and time over runs are part of any project. This affects the project cash flows and thus loan repayments. In order to safeguard against these issues, it is important to introduce project credit enhancement measures. These credit enhancements will be discussed in the following sections. Project appraisal methodology is discussed in this section.

PROJECT APPRAISAL

I. Appraisal on General Criteria

Even within the identified sectors, general criteria for selection need to be applied as mentioned below:

i. Compliance with Regional Plan, 2021;

ii. Priority requirement of community and link to development plans:

iii. NCRPB should look into the records of stakeholders' consultation by the ULBs/ Statutory Board to ensure whether actual consultations have happened for ensuring that the subproject is a priority subproject of the local communities; and

II. Technical Appraisal

The technical appraisal of a subproject is done to ensure that the subproject has a sound design, appropriate engineering and subproject compliance. While appraising a subproject technically, technical alternatives, proposed solutions, and expected results are examined. Technical appraisal is concerned with questions of physical scale, layout, and location of facilities.

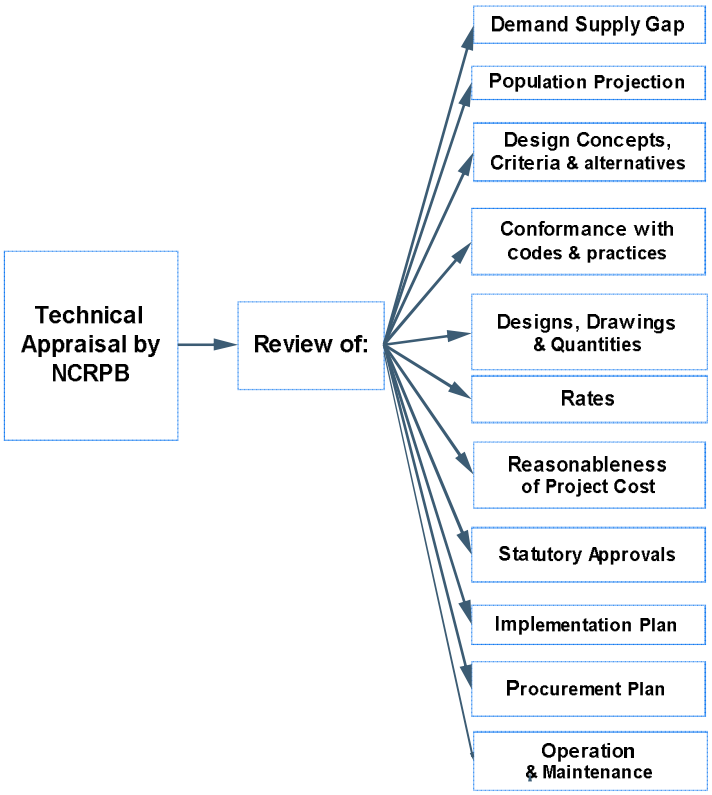
In addition, technical appraisal looks into and evaluates:

- The technology to be used (including types of equipment or processes and their appropriateness to local conditions);
- The approach to be followed for the provision of services;
- The quantum and the types of clearances to be obtained;

- If the subproject contains a realistic implementation schedules; and,
- The likelihood of achieving expected levels of output.

A detailed technical appraisal is required to be taken up for looking into the following specific technical aspects of the proposed subprojects. The technical team of NCRPB is required to look into these aspects of a subproject. Figure 3 below gives a pictorial representation of review requirements under technical appraisal followed by brief write-up on the same.

Figure 3: Technical Appraisal Process



Review of demand-supply gap. NCRPB will scrutiny the demand-supply gap, and review whether all criteria have been considered. NCRPB will also maintain a database on existing service levels and proposed increase in service levels after completion of the subproject – this will help in building the project pipeline.

Review of population projection. While undertaking a gap analysis, it should be assessed whether future growth in population has been suitably taken into consideration. Population projections are normally based on a time horizon depending on the life of the asset. There are various methods of carrying out a population projection. The accuracy depends on statistical tools used for the projection. NCRPB has to look into the trend in population increase based on information given in the sub loan application form, and compare with the increase suggested in the DPR. The projected growth in population suggested in the DPR must be justified on the basis of valid assumptions. This is very important as the entire design is based on this projection. Any abnormal increase or decrease in population projections will lead to failure of the project.

Review of design concepts, criteria and alternatives. Identification of site is of crucial importance, as there are technical parameters like soil tests, etc. which need to be looked into. The DPR should contain data on alternatives looked at during preparation of DPR, and justification for choosing a particular alternative.

- NCRPB will also look into the soil test reports of the identified site, which should be put as an Appendix to the DPR.
- NCRPB will analyze the environmental and social aspects covered in the DPR with respect to the selected site ensuring that these meet necessary Government and ADB standards.

Alternate technology. NCRPB will assess various technologies analyzed and suggested in the DPR, and the optimum technology suggested with reasons thereof. This analysis should develop a case study of the subproject at a later stage, as it mentions advantages and disadvantages of various options and can prove to be a sustainable model for similar subprojects as well. NCRPB has to bring out these options in their appraisal report.

Review of conformance of relevant standards, codes and practices. While preparing designs, NCRPB will need to ensure that the DPR conforms to standards, codes and practices stipulated by the respective state governments, like norms on roads by IRC, Water and waste water by CPHEEO, etc. if any. This will ensure that designs do not deviate from the suggested national standards.

Review of designs, drawings and quantities. The designs suggested in the DPR must be in conformity with the standards and must be accepted by the review committee. Based on the designs, drawings must have been prepared to scale. A copy of the drawings shall be made available in NCRPB.

Bill of quantities. Based on proposed design and technology, the DPR will include a detailed listing of quantities of every material used for construction, and their availability, also known as the bill of quantities (BoQ). NCRPB will confirm adequacy of provisions made in BoQ for material and labor man months. If it is not sufficient, NCRPB can revert back to the borrowers and suggest suitable modifications in the DPR.

Review of Rates. NCRPB will review rates mentioned in the DPR (against BoQ) for preparing detailed cost estimates against generally accepted schedule of rates. In case, schedule of rates are not available, market rates should be adopted. NCRPB will verify all items, and give special attention to adequacy of items for which lump sum amount is made as these items may not contain quantities such as road restoration charges to be made to road development authorities, shifting of utilities, etc.

Review of reasonableness of subproject cost. Upon review of rates and quantities, NCRPB has to check on the percentage of contingencies provided for the subproject. Contingencies are of two types:

i. Price Contingency: Normally there is a time gap between preparation of DPR and the time of execution. Obviously, there could be price escalations during this period. This gets accommodated in the contingencies. Secondly, in case of long gestation subprojects like a bulk water supply or a sewerage system for the whole city, it takes at least 2-3 years to complete the construction. In such cases there could be price escalation of the materials. This has to be accommodated in price contingency. Normally a maximum of 10% on price contingency is allowed in long gestation subprojects. However, depending on the inflation rates of these commodities[4], sufficient provision can be given.

ii. Physical Contingency: DPR preparation is based on surveys and estimates. But during actual execution there could be discrepancies in the field as against the information provided in the DPR, which might lead to requirement of more materials on site. To accommodate such discrepancies a physical contingency is provided in the subproject cost. Normally 5-8% physical contingency can be provided.

[4] Commodities like Steel undergo frequent upward revisions in cost. Sufficient provision using past 2 years trend may be given for such commodities

iii. Upon reviewing the reasonableness of BoQ, detailed cost estimates and contingencies, NCRPB should confirm the subproject cost.[5]

Review of Statutory Approvals. NCRPB should also ensure that necessary approvals such as administrative and technical approvals, pollution control clearances, environmental clearances, etc., have been obtained for the subproject, and copies of these are attached along with the DPR. Site clearances must be obtained even during subproject preparation itself as the total design might undergo a change in case of change in proposed project site. For example, a sanitary landfill site will require that the local bodies/statutory board have to first acquire the land and get permission from the Pollution Control Board. The subproject could undergo time delays if these clearances are left to be obtained in the project implementation stage.

Review of Implementation plan. DPR normally gives a detailed schedule of implementation, which should be verified by NCRPB for its appropriateness. This schedule will also form part of the bid documents during the tender process. NCRPB should give this schedule in their appraisal report, as it provides a base for them to monitor.

Review of Procurement Plan. NCRPB will ensure that all bid documents sent as part of DPR is in a format acceptable to NCRPB. A detailed review of the procurement plan will be undertaken to ensure its practicality.

Review of Operation and Maintenance. The operation and maintenance (O&M) section in the DPR should contain a break up expenditure likely to be incurred in terms of salary, power and materials for maintenance of assets being created. NCRPB will advise all borrowers to prepare a detailed O&M Plan, and submit it along with the DPR, and review adequacy of O&M plans. The DPR should also contain information on capacities available within the borrowers to undertake O&M of the proposed asset. If in-house capacities are not available, the DPR should contain other options of maintaining the system like privatization, management contract, etc., after having detailed discussions with respective local bodies/statutory boards/departments. While the technical team of NCRPB does a technical appraisal, the financial team will do the financial, economic and institutional appraisals.

[5] There could be circumstances when the cost given in loan application could either more or could be even less as compared to the cost arrived at by NCRPB. In such cases, NCRPB will communicate with the concerned borrower, and can continue with appraisal simultaneously if the subproject cost indicated in the sub loan application is less. In case the subproject cost in the sub loan application is more, NCRPB can request the respective department to give a revised application form, the reason being the loan and grant component will be more and NCRPB will have the constraint of approving sub loan to the extent of amount requested for by the departments

Sector-Wise Subproject Criteria for Review

NCRPB will utilize the following broad sector-specific criteria as guidelines for the selection of subprojects.

Community Water Supply and Sanitation. The objectives should be to improve access to safe drinking water, improve sanitation, minimize water-borne diseases, and improve health conditions. The focus should be on areas with a large population with little or no access to safe drinking water. Other criteria include the following:

i. No. of households benefited;
ii. Source of water;
iii. Types of distribution of water, viz., tubewells, pipes, etc. and its sustainability and life time;
iv. Land acquisition, if any and steps taken to acquire land; and,
v. Community participation, if any, envisaged as part of the project.

Roads. The objectives should be to improve access and to minimize travel time. The subprojects should be limited to urban roads. Broad parameters to be looked into are given as follows:

i. Length and breadth of roads;
ii. Connectivity with major roads;
iii. Quality aspects of roads based on standards; and,
iv. Encroachments, if any to be removed and enumeration of the same.

Solid Waste Management. The objectives should be to improve collection, and safe disposal of the solid waste according to MSW 2000 rules, in the ULBs. Broad parameters of concern include the following:

i. Activities that are taken up as part of the project, if it is in conformity with the MSW Rules, 2000.
ii. Whether options of PPP have been examined.
iii. Any awareness campaign is being conducted.
iv. Technical details in case of landfill.
v. Land acquisition, if any, and steps taken to acquire land.
vi. Objectives and outcome of the assignment proposed.
vii. Base line to be indicated.

Drainage Improvements. The objectives should be to improve collection and safe disposal of the runoff and grey water in the project area. Broad parameters for review shall include the following:

i. Activities that improves collection and disposal of runoff and grey water areas by at least by 50%; Base line to be made clear;
ii. Activities promote public awareness of the population on household

management of solid waste;

iii. Subproject demonstrates availability of a suitable site for safe disposal of the drainage water;

iv. Subproject demonstrates community involvement in selection of drainage sites for safe disposal;

v. Contours of drainage to have a free flow of water; and,

vi. Possibility of integrating this with road projects is preferable.

Institutional Infrastructure. The objective is to rehabilitate or construct institutional infrastructure to improve service delivery. Institutional infrastructure includes health, education, and community parks. Selection criteria include the following:

i. Preference for sites for rehabilitation or reconstruction will be given to facilities in rural areas and those that benefit large numbers of people;

ii. The planned facility is already included in the plan of the ULB;

iii. Possibilities of executing in PPP mode; and,

iv. Land acquisition, if any and its status.

III. Financial Appraisal

Financial appraisal means reviewing workability of proposals made in respect of raising finance (equity/sub loan/grant). The subproject financial appraisal will be done mainly on basis of cash flow estimation for a long but finite period. While doing a subproject appraisal, it is necessary to look into the revenues and surplus to be generated by the subproject itself, and the borrower's balance sheet as well.

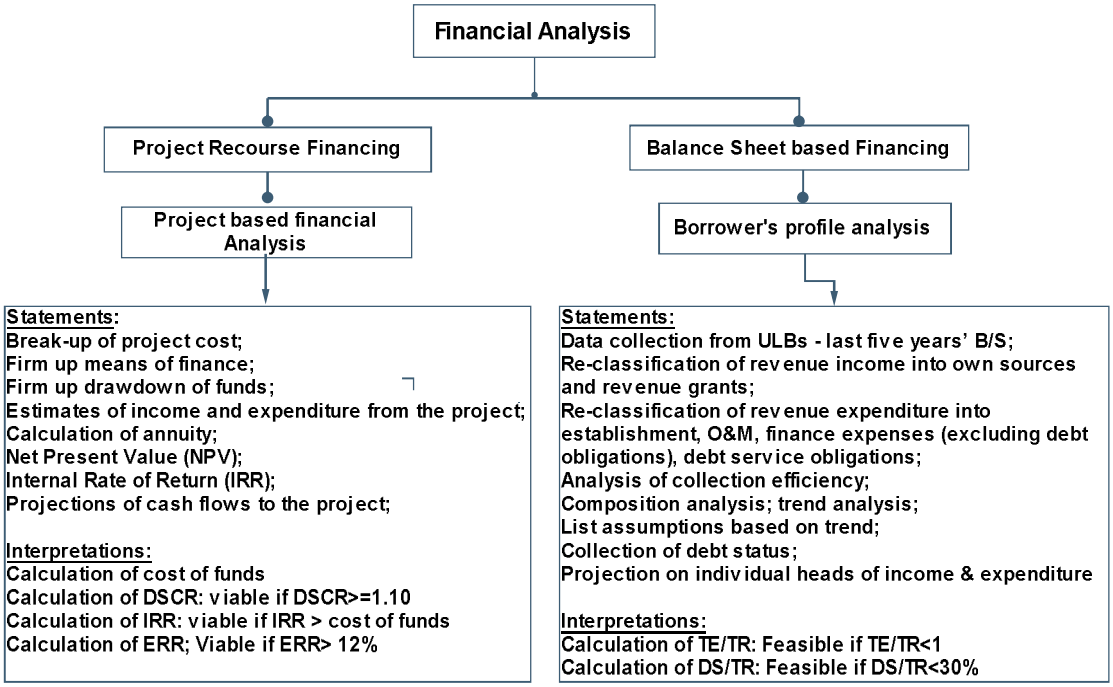
Appraisal in the Context of NCRPB. For capital intensive subprojects, grants allocated by the government may not be sufficient to meet the funding requirements of the subproject. Accessing loans are also not possible beyond a certain extent as it has an impact on the balance sheet of the borrower. In such cases, NCRPB has to look into possibilities of other sources of finance like introduction of one-time contributions (equity contribution), etc., which can enhance the financial worthiness of the subproject, as it will provide free money and cover certain cost like the O&M of the subproject.

These subprojects are said to meet their expenditures from their own revenue. This also called the project recourse financing or stand-alone subprojects. This kind of financing is different from the traditional method of financing that is based on the balance sheet support. Generally, subprojects in areas of water supply, sewerage, solid waste management, toll bridges, etc., opt for project recourse financing as costs are recovered through user charges, fees, tolls, etc. figure 4 gives a pictorial representation of financial appraisal of any subproject.

It is also worth mentioning that the revenues generated from the subproject may not be sufficient enough to meet O&M costs or the debt service. But there could be limited recourse to the subproject. Road, drainage, etc., subprojects do not present the opportunity of charging a user fee. In such a case there is no recourse to the subproject revenues, but repayments have to rely on the balance sheet surplus of the borrowers.

A detailed approach for undertaking financial analysis of subprojects is outlined below:

Figure 4: Financial Appraisal of Sub-Project



Subproject Recourse Financing

Recourse to revenues generated by subproject. First step is to prepare a cash flow of the subproject on a standalone[6] basis for a period equivalent to the number of years for sub loan repayment, or the life of the asset whichever is higher. In order to do analysis of subproject recourse financing, the following factors need to be looked into:

i. Subproject cost. The subproject cost will include price and physical contingencies. A break-up of base cost[7], contingencies and other charges should be highlighted, as illustrated in table 3 . Similar break up will be given for other sectors as well according to nature of works involved in the subproject.

ii. Means of Finance. The funding pattern of a subproject has an impact on the viability. More the grants, higher the viability. But there are limitations for providing grants and hence the concept of deposits or contributions from public can be attempted in subprojects having quantifiable beneficiaries. Means of finance for subprojects to be financed by NCRPB will be done according to prescribed norms described earlier; table 4 outlines a sample format for means of finance.

[6] Standalone means existence of a cash flow that is exclusively available for the project that does not require bringing in other revenues from any other source such as the balance sheet.
[7] Base Cost – cost excluding contingencies and supervision charges; precisely it relates to only the cost of works of the project

Table 3: Break-up of Cost for Sewerage Subproject

Particulars	Rs.	Rs.
Collection System	Xxx	
Pumping Station & Pumping Main	Xxx	
Treatment Plant	Xxx	
Low Cost Sanitation	Xxx	
House Service Connections	Xxx	
Subtotal Base Cost (A)		(A)
Contingencies-		
Price Contingencies – 10% of (A)	Xxx	
Physical contingencies- 5% of (A)	Xxx	
Subtotal Contingencies (B)	-	(B)
Sub-total (A)+ (B) = (C)	-	(A) + (B) = (C)
Supervision Charges (D)	-	(D)
Interest During Construction[8] (E)	-	(E)
Total Project Cost (C)+(D)+(E) =(F)	-	(C) + (D) +(E)

Table 4: Sample Format for Means of Finance

Particulars	Rs.	% to Project Cost
Sub loan	A	
Grant, if any	B	
Borrower Contribution	C	
User Contribution	D	
Total Project Cost	A+B+C+D	100%

iii. Draw down of funds. NCRPB is to provide both sub loan and grant to the subproject. Draw down means the amount to be withdrawn by the borrower both of sub loan and grants for financing subproject construction. DPR provides details on schedule of physical implementation that should form the basis for draw down. Apart from the DPR, the sub loan application of NCRPB also contains the draw down information. Based on the physical implementation schedule, NCRPB shall prepare a draw down schedule which will chart out the period and amount of the sub loan draw down for the subproject. Table 5 outlines a sample format of a financial draw down schedule is given below assuming a construction period of three years.

iv. Estimate of income and expenditure. While estimating income, any revenue generated by the subproject should be taken as income, like monthly user charges, fees, or periodical deposits, etc. For estimating the user charges the following data will be required:
    a. Are there any additional beneficiaries apart from the existing beneficiaries?
    b. Number of such beneficiaries of the subproject;

[8] Interest during construction – In case of projects exceeding construction period of 1 year, there will be interest accruing on loans drawn on the project even before construction period is complete. Such interest will be added to the project cost.

c. Income levels of such beneficiaries;
d. Tariff/user charges fixed by the council;
e. Is the tariff charged for both the existing and the additional beneficiaries?; and,
f. Income per annum by way of this revenue to the subproject.

Table 5: Sample Format of a Financial Draw down Schedule

Particulars	Years of Construction		
	Year 1	Year 2	Year 3
Phasing of Expenditure[9] (A)	30% of subproject cost	40% of subproject cost	30% of subproject cost
Amount spent every year (B)	Project Cost * Year 1 of (A)	Project Cost * Year 2 of (A)	Project Cost * Year 3 of (A)
Draw down (*)			
Grant, if any	30% of eligible grant amount	40% of eligible grant amount	30% of eligible grant amount
Sub loan	30% of eligible sub loan	40% of eligible sub loan amount	30% of eligible sub loan amount
Own Contribution	30% of the amount to be brought in by the borrower	40% of the amount to be brought in by the borrower	30% of the amount to be brought in by the borrower

(*) This is a tentative schedule and the actual disbursements of sub loan and grant will be made on the actual progress of work.

This would need to be followed for all revenues generated by the subproject. An increase based on the projected increase in the number of beneficiaries has to be calculated. Increase in the rates of tariff needs to be considered while calculating revenues. An assumption on the collections of user charges must be made, as the local bodies may not be able to collect the projected level of revenues. Table 6 outlines a sample format for estimation of income, assuming a repayment of 5 years.

Table 6: Sample format for Estimation of Income

Particulars	Assumption	Projected Financials				
		Year 1	Year 2	Year 3	Year 4	Year 5
No. of beneficiaries at the beginning of the subproject (A)						
No. of beneficiaries added during implementation (B)						
No. of beneficiaries at the end of the year (C)=(A)+(B)						
User Charges/Tariffs per month	Rs.100 per month					
Increase in user charges/tariffs	5% per annum					
User charges per annum (D)						
Revenues by way of user charges (C)*(D)						

Expenditure

Expenditure normally consists of O&M cost of the subproject and the debt service obligations of the subproject. Details of O&M can be obtained from the DPR, and should be cross-checked for its adequacy. An escalation equivalent to the inflation rates prevailing in the country should be used for projecting the cash flow.

[9] Phasing of expenditure means the amount scheduled to be spent for the project during the years of construction

With respect to the debt service, the actual debt to be serviced by the ULBs/ Statutory Board/Department for the subproject has to be taken for projections. Accordingly, annuities (explained below) can be worked out for the repayment period. For doing this, NCRPB has to be clear on the tenure of the sub loan, grace period, rate of interest and the repayment period.

Annuity and how to calculate it: Annuity is an equalized stream of cash flows (principal and interest payment by the borrowers) over a period of time. The formula for calculating annuity is:

$$\text{Annuity} = P \frac{r(1+r)^n}{(1+r)^n - 1},$$

Where, p = sub loan amount; r = rate of interest; n = no. of years

This can be simplified by using excel function in the computer which is @ PMT(rate, no. of years repayment, -(sub loan))

Illustration 1.Calculation of Annuity

Assuming a case where sub loan amount is Rs.20 million, rate of interest is 10.5%, tenure of sub loan is 12 years; grace period is 2 years; repayment is 10 years (tenure minus grace period).

The formula to be applied is @ PMT (10.5%, 10, -20) which gives the result of Rs.3.33 million. This is the annuity (Rs.3.33 million) to be paid by the borrowers over a period of 10 years. During the grace period, interest will be paid by the borrowers. Interest amount is the product of sub loan amount and the rate of interest (Sub loan amount x rate of interest).

In the case of the example cited, the interest amount will be Rs.2.10 million per annum during principal moratorium period. One calculates the interest payment by multiplying 20 million by 10.5%.

NCRPB will need to prepare an annuity schedule and incorporate the same in the cash flow of the subproject. Table7 outlines a sample format of an annuity schedule for a borrower. The annuity schedule has to be developed for the duration of sub loan.

Table 7: Sample Format for Annuity Schedule

S.No.	Years	Opening Balance of Sub loan	Annuity	Interest	Principal Repayment	Closing Balance of Sub loan
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Original Loan disbursed	Formula as given in eg.	(3) * rate of interest	(4)-(5)	(3)-(6)

Cash Flow Projections

Based on the calculations above, a projection for the number of years of repayment, or the life of the asset whichever is higher, will need to be calculated. Table 8 outlines a

sample format of statement showing cash flow projection assuming that the life of asset is 7 years and the loan repayment is 10 years[10].

Cash Balances in Cash Flow Projections. Opening balance of cash will be nil in the first year as the subproject will have just started implementation and from there on the closing balance of the previous year will be the opening balance. For example, the closing balance of 1st year will be the opening balance of 2nd year and so on. Surplus and closing balance can be determined as follows:

i. Surplus is the excess of income over expenditure for each year (income minus expenditure); and

ii. Closing balance of cash is the sum of opening balance and surplus of that year (opening balance + surplus).

Table 8: Sample Format of Statement showing Cash Flow Projections

Particulars	C1	C2	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Income	**(Construction Period)**											
Grant												
Loan												
ULBS/ STATUTORY BOARD Contribution												
Income from user charges												
Other income, if any												
Total Income (A)												
Expenditure												
Operation & Maintenance												
Debt-Service												
Other expenses, if any												
Total Expenditure (B)												
Opening Balance of cash (C)												
Surplus (A)-(B)= (D)												
Closing balance of cash (E)												

Interpretations on Feasibility. As described in the introductory section of financial appraisal, infrastructure subprojects can be judged based on their cash flows. The subproject is said to be viable if it has a positive cash flow. It will said to be unviable if the cash flow is not positive. Financial feasibility can be supported on the basis of couple of other parameters. These are (i) Debt Service Coverage Ratio (DSCR), and (ii) the Internal Rate of Return (IRR). These are discussed below:

Debt Service Coverage Ratio (DSCR)

DSCR denotes the number of times the surplus generated by the subproject can cover the debt service obligations. In other words, how many times of debt-service is the surplus of the subproject. The formula by which this can be worked out is given below:

DSCR = Surplus before interest / (Principal payment + Interest payment).

[10] It is always better to restrict the loan period within the life of the asset.

For explaining to you this concept, we give an example that will help you calculate the DSCR.

Illustration 2.Calculation of DSCR

Let's assume the following for calculation purposes-
Payment of Principal= Rs.2 million
Interest payment= Rs.2.2 million
Existing Surplus = Rs.8 million
Calculation of DSCR:
Surplus before interest = Surplus (Rs.8 million) minus interest (Rs.2.2 million) = Rs.5.8 millions (A)
Total debt repayment = Principal (2m)+ Interest (2.2 m) = Rs.4.2 millions (B)
DSCR is 1.38 times (A/B)

The normal accepted DSCR by Financial Institutions is 1.25. However, for infrastructure subprojects the accepted norm could be even 1.10. DSCR provides comfort for financial institutions like NCRPB to ensure consistent repayments of sub loan. NCRPB should ensure that DSCR is at least 1.10 times and anything below that is not worth funding. Table 9 outlines a sample format for calculation of DSCR.

Table 9: Sample Format for Calculation of DSCR

Particulars	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Total income										
Less-										
O&M										
Subtotal (A)										
Debt Service:										
Principal payments										
Interest payments										
Total debt payment (B)										
DSCR (A/B)=(C)										
Average DSCR	@SUM (Y1...Y10(A)) / @SUM(Y1…Y10(B))									

Present Value of Money. The value of money accruable in future, as on date is called the present value of money. Decisions on capital subprojects are taken based on present value. If the net present value of a project is positive, the project should be reviewed in greater detail. If the NPV is negative, perhaps the project should be dropped or the project should be reconfigured to a more acceptable design. to be dropped. A simple illustration will help you understand this concept.

What is a Net Present Value. The **net present value** of an income stream is the sum of the present values of the individual amounts in the income stream. Each future income amount in the stream is **discounted**, meaning that it is divided by a number representing the opportunity cost of holding capital from now (year 0) until the year when income is received or the outgo is spent. The opportunity cost can either be how much you would

have earned investing the money someplace else, or how much interest you would have had to pay if you borrowed money.

The word "net" in "net present value" indicates that our calculation includes the initial costs as well as the subsequent profits. It also reminds us that all the amounts in the income stream are net profits, revenues minus cost. In other words, "net" means the same as "total" here.

The net present value of an investment tells you how this investment compares either with your alternative investment or with borrowing, whichever applies to you. A positive net present value means this investment is better. A negative net present value means your alternative investment, or not borrowing, is better.

Let's assume that the discount rate (the interest rate that you could earn elsewhere or at which you could borrow) will not change over the life of the project. This makes the calculation simpler. With this assumption, we can use the usual formula:

Year	0	1	2	3	4	5	6
Income(Rs. In lacs)	-1000	200	200	200	200	200	200

Present Value of any one income amount = **(Income amount) / ((1 + Discount Rate) to the *a* power)**

a is the number of years into the future that the income amount will be received (or spent, if the income amount is negative).

The net present value (NPV) of a whole income stream is the sum of these present values of the individual amounts in the income stream. If we still assume that income comes or goes in annual bursts and that the discount rate will be constant in the future, then the NPV has this formula:

$$NPV = I_0 + \frac{I_1}{1+r} + \frac{I_2}{(1+r)^2} + \ldots + \frac{I_n}{(1+r)^n}$$

Three properties of the net present value of an income stream are:

1. Higher income amounts make the net present value higher. Lower income amounts make the net present value lower.
2. If profits come sooner, the net present value is higher. If profits come later, the net present value is lower.
3. Changing the discount rate changes the net present value. For an investment with the common pattern of having costs early and profits later, a higher discount rate makes the net present value smaller.

The results of the illustration is as follows-

Illustration 3: Calculation of Net Present Value

Year	Income (Rs. In lacs)	Discount Rate	Discounted Cash flow
		9%	
0	-1000		-1000
1	200	0.917	183.49
2	200	0.842	168.34
3	200	0.772	154.44
4	200	0.708	141.69
5	200	0.650	129.99
6	200	0.596	119.25
	Net Present Value		-102.82

The result shows that the NPV is negative, and therefore, the project should not be accepted. However, if the project is considered to be essential, a negative NPV result should prompt project developers to perhaps reconfigure the project design or dimensions. Let's assume a different income stream, which is higher, the existing one, and check out the results. The following table provides the same

Year	Income (Rs. In lacs)	Discount Rate	Discounted Cash flow
		9%	
0	-1000		-1000
1	220	0.917	201.83
2	250	0.842	210.42
3	270	0.772	208.49
4	230	0.708	162.94
5	200	0.650	129.99
6	230	0.596	137.14
	Net Present Value		50.81

In summary, the net present value is higher if the income amounts are larger, or if they come sooner, or if the discount rate is lower. The net present value is lower if the income amounts are smaller, or if they come later, or if the discount rate is higher. When there are two projects, they can be compared, and one which generates maximum NPV can be chosen to be taken up further.In the context of NCRPB, this could be more theoretical, however, it is suggested that these are known, and applied wherever it is required,

Internal Rate of Return. The Internal Rate of Return is the rate at which the future discounted cash flows equal the initial investment (cash outflow), in other words, the rate at which point, NPV equals 0. In order to understand what we mean by the future discounted flows, it will be necessary to know the present value of money.

Calculating IRR. The same concept of present value as used in the illustration given above is used for calculating the IRR. An illustration of IRR calculation is given overleaf.

NCRPB while doing financial appraisal will have to apply the same concept for calculating IRR for infrastructure subprojects. For calculating IRR, only the operational outflows like O&M need to be taken and interest and annuities should not be taken for calculations. Table 10 outlines a sample format for IRR calculations.

Table 10: Sample Format for Calculations of IRR

Particulars	C1	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Revenue Income											
User Charges											
Other income											
Total (A)											
Revenue Expenditure											
O&M											
Total (B)											
Net surplus/deficit (C)											
Cost of the subproject (D)	xxx										
IRR	@ IRR (C1...Y10)										

An important question, however, is: with the given IRR, how do we decide that subproject is viable or unviable? The basic criterion for viability check with respect to IRR is that the IRR should be greater than the cost of funds / cost of capital.

Cost of funds or capital. Theoretically, cost of capital is the term used to refer to the weighted average of the cost of the debt and equity. In other words, the term cost of capital refers to the minimum rate of return that a firm must earn on its investments so as to keep the value of the firm intact. Hence, if IRR is said to be higher than the cost of funds, the subproject is said to be viable. An illustration for calculation of IRR for a sample subproject has been reproduced for your benefit.

Illustration 4: Calculation of IRR

A project costing Rs.320000, has a cash flow stream of year 1 = 95000 ; year 2 =105000; year 3= 90000; year 4 = 80000; year 5=100000. Calculate IRR.

Particulars	Cash Outflow	Cash inflows				
		Year 1	Year 2	Year 3	Year 4	Year 5
Cash inflows		95000	105000	90000	80000	100000
Cash outflow	320000					

Now, we need to find the rate at which the discounted cash flows equal the present outflow of Rs.320000. The steps are:

i. Calculate the discount factors for the next five years;
ii. Multiply the cash inflows with that year's discount factor;
iii. The above gives the discounted cash flow of every year, i.e., the present value of the cash flows; and
iv. The sum of the discounted cash inflows of the five years should be equal to the outflow towards the project, i.e., Rs.320000.

This can be done on Excel using a computer by doing an iterative process as mentioned below:

For calculating IRR by using MS excel on a computer, discount factors can be calculated as follows: For example, we take a discount rate of 10%; the actual formula used is 1/(1+.10)^1for first year, 1/(1+.10)^2 for second year and so on. The advantage of using computers is that accuracy is obtained while doing IRR and iteration is possible as well.

In the above case, the result comes to 14.54% as is described below:

Particulars	Cash Outflow	Cash inflows				
		Year 1	Year 2	Year 3	Year 4	Year 5
Cash inflows (A)		95000	105000	90000	80000	100000
Cash outflow (B)	320000					
Discount factor (C)	14.54%	0.873	0.762	0.665	0.581	0.507
Discounted cash flows (D)=(A * C)		82940	80034	59892	46479	50724
Cumulative cash flows (E)		82940	162975	222867	269346	320070

At the end of year 5, the discounted cash inflow = present cash outflow. So the IRR of the project is 14.54%.

In the context of NCRPB, how does one calculate the subproject's cost of funds? NCRPB gets subprojects which consist of a sub loan and in some cases is blended with grant financing. The cost of a loan is the cost at which NCRPB lends to the subproject. In case of other loan funding, the cost of other loan needs to be taken. However a grant does not bear any cost. The following illustration will give clarity on the cost of capital.

Illustration 5: Calculation of Cost of Capital

A project costs Rs.40 million. The means of finance for the project is: Loan-75% (Rs.30.0 mn); Grant-15% (Rs.6.0 mn.); ULB contribution-10% (Rs.4.0 mn). Loan is given at 7.5% rate of interest.

Calculation of Cost of Capital

Particulars	Rs.mn.	%	Weighted Average*
(1)	(2)	(3)	(4)
Loan amount(A)	30.00	7.50%	2.25%
Grant (B)	6.00	0%	0%
LA Contribution (C)	4.00	0%	0%
Total (D)	40.00		2.25%

Therefore, Cost of funds/ capital is 6.63% for the project

Weighted Average Calculations- (2A * 3A)/ 2D - 21.20 * 12.50%/ 40=6.63%

Note: The grant and ULB contributions do not bear any cost to the subproject, as it's free money brought into the project.

Feasibility. NCRPB while doing a financial appraisal has to do the above with respect to a subproject generating revenues on its own. Since the subprojects appraised by NCRPB will be infrastructure subprojects, NCRPB can rely on the cash flows generated by the project. In addition, DSCR of the project should be analyzed to give a comfort on repayments. As a standalone subproject, IRR can be used to find out whether the subproject is a feasible proposition.

Since the subproject involves public welfare as their priority and involve community participation and envisages an economic impact, even if IRR is not greater than the cost of capital, the subproject can be taken up if the economic impact or the ERR is higher. However, since these projects deal with public at large, which solely depends on the pro-active functioning of the local bodies, it is always better to analyze the balance sheet in order to have a back up for repayments. A detailed balance sheet analysis is given as follows.

IV. Economic Appraisal

Economic analysis examines the benefits and costs of undertaking an activity, subproject or program for the country and people as a whole, rather than that of an individual, organization or business.

Need for Economic Analysis

An economic analysis is needed when the government or a state institution is interested in investing for the welfare of the people or the citizens. A financial analysis provides answers to whether a subproject or an investment is profitable to an individual, firm or institution. But such an analysis does not provide any information on the benefits and costs to the people at large or country as a whole. Economic analysis indicates the costs and benefits to the society and hence the country as a whole. Economic analysis is,

therefore, much broader in its scope than the financial analysis of a subproject. Thus an economic and financial analysis taken together is a useful decision tool for the decision maker, whether he or she is from the private or public sectors. Obviously many infrastructure subprojects do not bring in financial revenues and if investments are to be undertaken, the only way to assess such subprojects is through an economic analysis.

Economic Analysis: The Basic Steps

Basic steps for an economic analysis of subproject are mentioned below:

i. Prepare an initial statement about:
    a. Need for the subproject;
    b. Objectives of the subproject;
    c. What are the major benefits from the subproject;
    d. What will be the situation with and without the subproject;
    e. What will be the positive and negative impacts of the subproject on the environment, society, and the area or the country as a whole;
    f. Who are winners and losers by the subproject and will the losers be compensated; and
    g. Were the alternatives to the subproject in question examined and if examined, what was the rationale for choosing this alternative.
ii. Collection of basic data on the subproject costs, which includes:
iii. Preparation of detailed cost estimates of the subproject components, that may include, costs of construction, purchase of equipment, materials, design and supervision, labor costs, etc. It is necessary to identify and cost every item of expenditure needed for the satisfactory completion of the subproject along with the required quality standards, environmental safeguards and timing;
iv. Phasing of investment;
v. Estimation of O&M costs;
vi. Estimation of other quantifiable economic costs arising from the subproject (usually costs for which mitigation is not possible could be included here);
vii. Provision for environmental mitigation costs identified in the preparation stage; and
viii. Other intangible costs.

Items that should be excluded from an economic analysis (but included in a financial analysis) include taxes and duties, sunk costs, interest payment, principal payment and interest during construction period, and contingencies.

The basis for estimating economic costs should be clearly specified, and data to be collected may include the following:

i. Financial revenues arising from the subproject;
ii. Tangible benefits from the subproject that can be quantified and valued. (For example, fuel savings due to road improvement, medical costs saved by a water subproject, etc);

iii. The basis for estimating the benefits should be clearly specified;

iv. Intangible benefits arising from the subproject; and

v. With and without subproject benefits.

The next step is to undertake an economic analysis using any simple spread sheet program such as Excel or a more sophisticated statistical program with projected cash flows over the life of the subproject or subproject period. The Economic Rate of Return (ERR) or the Financial Rate of Return (FRR) if only financial revenues and costs are analyzed, can be estimated using such data. In order to help you understand economic analysis of a subproject, we give an example of economic appraisal of a subproject in its actual setting at the end of this section.

Other Relevant Aspects of Economic Analysis

Other aspects that must be examined in order to complete the analysis are mentioned below:

i. Fiscal impact of the subproject. The financial impact of the subproject on the institution or the organizational entity that is going to invest in the subproject should be analyzed on the basis of the terms and conditions of the sub loan;

ii. Financial sustainability of the subproject. The financial sustainability of the subproject in terms of the institution's capacity to repay may be discussed briefly. A detailed analysis of the financial sustainability of the institution should be undertaken in the financial analysis to be undertaken separately for the subproject; and

iii. Environmental impact of the subproject. A more detailed analysis of the environmental impact – both positive and negative – should be undertaken.

Limitations and Benefits of an Economic Analysis

The major limitations are:

i. The difficulty in obtaining accurate data which can result in a poor subproject being shown as a viable one;

ii. The person who conducts such analysis should be experienced or have the advice of several specialists in the field to prepare a good report. Such resources are difficult to obtain in the local areas; and

iii. The economic analysis is only a guide, and consideration may be given to other factors such as wants of the population, endangering of life etc may be given priority in decision making.

The major advantages are:

i. It reduces the probability of making a very poor decision on investment;

ii. It promotes a more detailed examination of the non financial benefits and costs and also economic benefits of a subproject and aids decision making; and

iii. It provides the appraiser of the subproject much greater information that becomes helpful in decision taking for subproject implementation.

Illustration 6.Simulated Example of Economic Analysis of a Road Project

Economic Appraisal

A town has an area of about 9 sq. kms, is located in a hilly locality. The topography is hilly with tea and spice crops grown in home gardens. The economy of the town is largely agriculture based, with major crops grown being tea, paddy, spices including cocoa, cardamoms, cinnamon, and coffee, areca nut and betel leaves. There are not many large industries in the area. Rice and saw mills are the most common industries in the area followed by garment manufacture (3 factories), wood work, brass products, jewellery making and other small industries. There are only two commercial banks, but there are a variety of business and commercial establishments in the area.

The improvement of these roads will provide a number of benefits to the local population, including reduction in travel time, reduced delays in transport of produce, goods and services, and improved environment by reducing dust and muddy pools. It will also facilitate public transport, link cities and villages within the local body and improve access for vehicles coming in to the area. Some roads will significantly reduce the distance of travel due to the impassability of the present roads. Therefore, the population of the local body as well as persons from outside of the area doing business and industries within this area, and also the businesses and commercial establishments will receive considerable economic benefits from the subproject.

The environmental impacts of improving the road are negligible, with considerable improvement in the surrounding environment possible with the rehabilitation of the roads. Financially, the local body has the capacity to meet the repayment requirements of the proposed sub loan including interest and capital. The repayment will not exceed 24% of estimated total revenue in any year during the sub loan repayment period. The operating surplus is positive at present and is expected to remain positive throughout the sub loan repayment period and is expected to triple from the present value of by the end of the sub loan repayment period. Thus finances of the local authority appear satisfactory and the sub loan is expected to be fiscally sustainable.

Economic Cost and Benefits

In estimating the Economic Rate of Return (EIRR), tangible economic benefits pertaining to the roads have been evaluated and corresponding annual cost savings compared with the subproject capital and annual maintenance costs

Costs

The total cost of the subproject is estimated at Rs 64 million as follows

	Rs Million
Civil Works	54.24
Design and Supervision (8%)	4.34
Physical Contingencies (8%)	4.34
Price Contingencies (2%)	1.08
Total Cost	64.00

The subproject cost will be financed as follows:

	Rs. Million
Subloan	21.12
Grant	38.40
ULB finances	4.48
Total	64.00

Benefits

Cost Savings from Reduced Time of Travel through Improved Roads.

Present number of vehicles (cars, lorries, vans, buses) within ULB:		1,100
No of motor cycles/three wheelers within ULB:		2,000
Present no of vehicles (cars, lorries, vans, buses) entering ULB:		900
No of motor cycles/three wheelers entering ULB:		2,500
Estimated reduction in fuel per annum (litres):		79,200
Annual cost saving (79,200*39):	Rs.	3,088,800

The aforementioned estimate of cost savings has been made based on the following assumptions

Saving of 1.5 litre/month per vehicle for vans, lorries, cars & buses (2,000*1.5)

Saving of 0.8 litre/month for motor cycles and three wheelers (4500*0.8)

Cost saving @ Rs 39 per litre (average of petrol and diesel prices) (45+33)/2

Apart from the above benefits, there are also intangible benefits such as improvements in health due to reduced dust, reduction in repair and maintenance to vehicles, improved productivity in estates, commercial and business establishments due to reduced transport delays, improved aesthetic environment for the city, better business climate for investments and improved roadside development activities, less hassle for men and women in carrying goods, water and accompanying children to school and other work, less traffic congestion on the roads, reduced emissions from vehicles, better drainage of storm water and reduced flooding of roads, etc.

The total population of the area is estimated at around 65,000 in 2005 and growth rate between 2001 and 2005 has been estimated to be in the region of 1% per annum. It is estimated that about one-third of the population of the local authority area will directly benefit from the roads as they reside in the areas where the roads have been selected for rehabilitation. Thus approximately 20,000 persons will benefit directly from the improvement of roads in the area. Apart from this, vehicles using these roads will benefit from less wear and tear and vehicle owners will be able to save on fuel due to road improvement. Over 3000 vehicles including motor cycles, three wheelers, buses, vans, cars and lorries, enter the municipal area daily for business, commercial and other purposes. The owners of these vehicles would also gain substantially in economic terms by the improvement of these roads. Most people can be identified as winners in this subproject, with all sectors of the population benefiting from the subproject.

Economic Rate of Return

Based on total annual savings in cost through implementation of the proposed road subproject and the pertinent Capital and Annual O&M costs, the Economic Rate of Return (ERR) for the subproject has been estimated over a 20 year design period as 13.3 %. If it is possible to estimate the economic value of other economic benefits that are non-tangible and could not be quantified, the benefits would be much higher than indicated above and the ERR would also be consequently much higher.

Sensitivity analysis of the subproject shows that if the economic costs go up by 10% the ERR drops to 11.8% and if the economic benefits go down by 10% the ERR drops to 11.6%.

V. Environmental Appraisal

This section is applicable only when NCRPB approaches ADB lending. This is subject to change according to the norms applicable as on date of loans from ADB.

For environmental appraisal of subproject, NCRPB will advise ULBs to prepare and submit an environmental subproject information document and subproject brief along with DPR. NCRPB will identify the extent of environmental impacts and the scope of Environmental Analysis. Projects with no significant impacts will be cleared at this stage itself. Subprojects classified as "Category A" of significant environmental impacts according to ADB classification, (i.e., that could have significant adverse environmental impacts or some adverse impacts) will be undertaken only with prior concurrence of ADB. Other subprojects will go through the normal statutory processes followed by the Pollution Control Board or as agreed with ADB.. Environmental assessment will determine the extent of impacts and how the impacts will be mitigated, minimized by planning, approaching the activities in an environmentally sensitive manner and adopting specific mitigation measures. No scheme shall have a negative environmental impact on the communities.

A step-by-step approach of doing an environmental assessment is outlined below-

i. The first step in environmental assessment will be preliminary screening. The borrower or the ULB, through its Environmental Officer/Technical Officer, will accomplish this task using the rapid environmental assessment checklist. Based on the screening the environmental officer will prepare an environmental subproject brief.

ii. All these can be taken from the DPR prepared by the consultants. The categorization will also be given in the DPR. This process is to create understanding about the environmental impacts on sub-projects which is generally not found in any part of India.

iii. Projects assessed to have some adverse environmental impacts will be required to go through the ADB and adhere to their guidelines, with respect to developing environmental mitigation measures or an Impact Assessment (IA) depending on case to case. Normal statutory requirements of PCB also may be followed.

iv. Once the ULB adheres to this, NCRPB will forward for the review and endorsement of ADB for approval;

v. Rapid environmental checklist is attached to the sub loan application form. This will be useful in accepting or dropping a subproject proposal in early stages. NCRPB should review and approve the subprojects subject to EA and Government procedures;

vi. The ULB will also ensure that the environmental assessment is undertaken in a participatory manner. Stakeholder consultations will be documented in the environmental assessment documents consistent with Government and ADB

guidelines and policies. The NCRPB will ensure compliance with Government regulations on environmental permits, licenses, and clearance. Release of any NCRPB funds for specific subprojects will be contingent on prior issuance of necessary permits, licenses and clearance by relevant Government authorities;

vii. NCRPB will also provide contractors with guidelines for environmentally sound construction practices and include environmental safety requirements into the technical specifications and contracts for civil works;

viii. Environmental assessments will be approved before commencement of detailed design in order to ensure that good practices are included in the technical design. The results of the environmental assessment will be communicated to the local community before commencement of construction; and

ix. Technical supervision during planning, design, construction, and operations of the subprojects will be provided by the NCRPB / respective implementing agencies to ensure that environmental concerns are addressed and appropriate mitigation measures are in place. Monitoring will be undertaken in each phase of subproject implementation.

An environmental assessment checklist for subprojects to be financed through NCRPB is reproduced below, and NCRPB will ensure compliance of all subprojects to these criteria.

Environmental Assessment Checklist

The environmental assessment checklist is outlined in table 11. If the subproject does not comply with requirements of this checklist, wherever applicable, ULBs/Statutory Board will need to ensure that outlined special specifications are addressed to in the DPR.

Table 11 : Environmental Assessment Checklist

Item	Special Specifications	Sector
Water Supply Schemes		
The subproject will not be located in the premises of historical, cultural, religious sites.	If this is absolutely not possible, approval in writing from the relevant Government agencies and custodians of religious centers needs to be obtained.	W, R, SWM, S, D
The subproject will not be located within conservation area, protected area, sanctuary and forest areas.		W, R, SWM, S, D
The source should be assessed and writing approval is obtained from the PWD with regard to all surface water sources.	The PWD will be assisted to ensure that all concerned parties are consulted and agreement is reached on the use of the source.	W
The subproject will not be developed if such development will adversely affect the present users of the source.	Detail investigation on the impacts of groundwater withdrawal on water table and other users should be carried out.	W

Item	Special Specifications	Sector
Sites located close to residential areas will be avoided	If this is not possible consent for locating the site will be obtained from the community.	SWM, S
Subproject components will not be located on steep slopes, landslide areas, and moist areas.	If this is not possible clearance shall be obtained from respective Government agencies, as required.	W, R
Scheme will not be implemented if the raw water quality is likely to be impaired over the capability of the treatment system.	Source protection measures are recommended in order to ensure the raw water quality.	W
Scheme will not be implemented if it is not possible to maintain an adequate flow during the dry weather after considering the environmental flow requirements	Storage of water as a solution shall be considered if the economic and environmental impacts are within acceptable.	W
Scheme will be not be implemented if critical components of the subprojects are likely to be subjected to frequent floods.		W, SWM, S
Construction activities as far as possible will be undertaken during the dry season unless otherwise directed in the environmental assessment.		W
Site for disposal for spoil will be selected prior to the start of construction work	Local Authority shall select environmentally and otherwise suitable sites for disposal of spoil	R
Any cleared topsoil will be set aside for later use. Vegetation cover will be replaced after construction of the scheme.		W
Subproject is not implemented if more than 20 families are involved in resettlement and RAP will be developed for each subproject involved with resettlement.	The RAP will be developed in accordance with the GosL policy on resettlement.	W, R, SWM, S, D
Avoid destruction of trees as far as possible		R
Avoid unaesthetic cults and fills		R
Pipe laying on steep slopes will be avoided. Also pipe laying on the road surface in newly rehabilitated roads will be avoided	Adequate protection measures will be implemented if this is unavoidable. Prior approval from roads authorities will be obtained in all cases of road excavation.	W, S, D
If premix plants if established shall have environmental licenses from authorities	Obtain necessary clearances as applicable	R
Obtain construction material only from licensed and approved quarries		R

Item	Special Specifications	Sector
Measures for mitigation of construction impacts will be identified for all subprojects		W, R, SWM, S, D
Provide a buffer strip around the site where ever possible.	Take adequate environmental safeguards to maintain the environmental quality of the surrounding area in absence of a buffer zone	SWM, S,
Subprojects will not be implemented without a leachate collection system and treatment if leachate will critically pollute the downstream water-bodies		SWM,
Hazardous waste will not be allowed		SWM, S
Transfer stations will be avoided as much as possible	If this is not possible community approval will be obtained for citing transfer stations	SWM
Adequate measures will be taken to prevent pollution of roads during transport of garbage / solid waste		SWM
Sites will be properly covered and fenced to avoid any further encroachments, prevent stray animals and scavengers		SWM, S, D
Local regulations /standards applicable to discharge of treated effluent, sewer overflows, disposal of sludge and operations of plant and pumping stations will be observed	Pollution Control Board will be obtained for operations	S
Treated wastewater will not be discharge to water bodies that will be adversely affected by such discharge.	Detailed environmental assessment will be made prior to selection of discharge location/water body	S
Storm water will not be directed to streams or canals that are adversely affected in terms of water quality and by siltation as a result by impairing the short or long-term uses.	If this is not possible a siltation ponds or silt traps will be provided in the system.	D
Measures will be taken to prevent dumping of solid waste and directing sewerage and wastewater into drains.	Implementation of SWM program, carrying awareness programs, enforcement of pollution control regulations are needed as parallel actions.	D
Change to natural drainage patterns will not be included in the subproject		D
Treated wastewater will not be discharge to water bodies that will be adversely affected by such discharge.	Detailed environmental assessment will be made prior to selection of discharge location/water body	D

VI. Social Appraisal

NCRPB shall carefully select subprojects that will not involve significant resettlement impacts[11], to start with. Gradually this can be attempted. Major impacts are defined as involving affected persons being physically displaced from housing and/or having 10% or more of their productive, income generating assets lost.

Subprojects wherein resettlement (voluntary and involuntary) is envisaged, the following procedure will need to be followed:

i. The ULBs will screen potential involuntary resettlement impacts through a screening checklist and will send it to NCRPB for review. If the checklist indicates any potential resettlement impacts, the ULBs with guidance from the NCRPB will formulate a Resettlement Plan (RP) consistent with the resettlement framework;

ii. The ULBs will conduct consultations with all stakeholders regarding how to avoid and minimize involuntary/voluntary resettlement impacts. Needs and preferences will be identified;

iii. A socio-economic survey of a sample population will be conducted to identify different categories of Project Affected Persons (PAPs), based on the degree and scale of impacts of the subproject on PAPs. A census, an asset inventory, and a detailed measurement survey will be undertaken;

iv. An entitlement matrix to outline entitlements of all PAPs including non-titled PAPs will be formulated. If new categories of PAPs and types of losses other than those listed in resettlement framework entitlement matrix are identified, appropriate entitlements will be added in the RP;

v. A time-bound schedule for RP implementation, procedures for grievance redress, monitoring and evaluation (both internal and external) will be formulated.

vi. The draft RP will be disclosed to all PAPs and will be sent to NCRPB who will review the same for compliance with ADB procedures;

vii. Once NCRPB reviews the RP, it will be sent to ADB for approval. A subproject with significant resettlement impacts will have a full RP which is consistent with ADB's Involuntary Resettlement Plan (IRP);

viii. The RP will be finalized based on the findings of the detailed measurement surveys, census and full asset inventory. The final RP will be translated into local language and disclosed through public notices at ULB's office and the Collector's office, and through mass media. The final RP will also be posted on Government and ADB resettlement websites;

ix. The approved RP will be implemented before any award of construction contracts of the subproject; and

x. Before the means of finance are fixed, the above issues should be addressed and remedies designed in order to see that no legal proceedings result in future date.

[11] resettlement is significant where 200 or more people experience major impacts

Resettlement Principles, Procedures and Resettlement Matrix

i. The draft Resettlement Framework is based on the Involuntary Resettlement Policy (IRP) of ADB, the Land Acquisition Act (LAA) of the region shall be followed, as agreed with ADB, in resettlements.

The entitlement matrix as agreed with ADB shall be followed.

G. Institutional Appraisal

The key criteria to be taken into account in the appraisal of the DPR in relation to institutional capacity would be the capacity to operate, monitor and maintain the subproject. The judgments about the capacity which the ULB / Statutory Borad possesses for operating, monitoring and maintaining of subproject should be concentrated on the following aspects.

Organization Chart. The existing organizational chart will disclose how the work distribution in the ULBS/ Statutory Board has been effectively organized. The unit or department and the job positions that are responsible for executing the operations of the subproject should be evident from the functional distributions shown in the chart. For instance the demarcation of responsibility under the Sanitary Inspector or the Health Officer attached to the ULBS/ Statutory Board would establish the capacity available to operate health awareness programs and community participation on subproject work.

Capacity of the Technical Department. In any subproject to be implemented, the responsibility for operation, monitoring and maintenance devolves on the Technical Department. Hence much attention has to be planned on appraisal of the capacity of the technical department to undertake the subproject. The availability of the required machinery, equipment and the men is necessary to be ascertained. This should include the qualified technical staff and the required number of workers to undertake the subproject. A detailed work plan of the subproject, indicating the activities to be undertaken with target dates, should be obtained.

Experience. The experience, which the Technical Department has acquired in managing subprojects of this nature, has to be established with documentary evidence. A schedule of such subproject activities completed with the necessary details of time period, the nature of work and the processes followed would be necessary. ULB / Statutory Board would have also acquired appropriate training to manage donor funded subprojects earlier. Such information should confirm that the ULBs/ Statutory Board possess the required standard of capacity. These particulars will also indicate innovative activities undertaken to increase the revenue earning capacity of the ULBs/ Statutory Board.

Management Efficiency and Effectiveness. The operational activities of the ULBs/ Statutory Board need to be managed efficiently and effectively to ensure that the end results of infrastructure development are achieved. The capacity of such efficiency could be established with documentary evidence of action plans, budgets and annual reports prepared for the year.

With these appraisals done, NCRPB should go ahead with obtaining approvals from their Board of directors.

BALANCE SHEET ANALYSIS

A balance sheet analysis represents the traditional method of funding a subproject. In the context of NCRPB, irrespective of whether the subproject generates revenue or not, it is advisable for NCRPB to do a balance sheet analysis, so that any set back in the subproject revenue generation can be backed up by the support of the balance sheet. The methods of doing a balance sheet analysis are given in the following paragraphs:

I. Presentation of ULBs Balance sheet.

ULBs in NCR, follow cash based accounting method. NCRPB's clients include Urban Local bodies, Statutory Boards and State Governments. Though each of them have different way of presenting their income and expenditure statements, the concepts are anyway the same. Therefore, in the absence of any statement produced, with generic heads of income and expenditure, a balance sheet analysis is briefed below.

The various heads under which any department, Urban Local Bodies in particular, would have their statements are (i) General Administration, (ii) Health Service, (iii) Physical Planning, (iv) Public Utility Services, (v) Welfare Services, among others. Both revenue Incomes and expenditures are generally shown under these heads of the department.

Heads of Income and Expenditure

Heads of income

i. Assessment rates and taxes: rates and taxes at which properties are assessed. This income is generated by ULBs themselves. According to 74th Constitutional Amendment, ULBs have the power to increase the tax rates;

ii. Rentals: this is also an income generated by the ULBs on their own. These are the rentals collected from their properties such as markets, shopping complex, etc;

iii. Licenses: Trade licenses;

iv. Fees for services: this is the fees collected by the ULBs for the services provided by them like parking fee, etc;

v. Other income : these are miscellaneous incomes received by ULBs; and

vi. Revenue grants / Assigned Revenues: this is the major source of income for a ULB, which is obtained from the State government. These revenue grants normally boost up the position of the ULB. However, the ULB has to largely depend on the State for their releases, which invariably gets delayed.

Heads of Expenditure

i. Personal emoluments: these are the salaries and other perquisites paid to employees;

ii. Traveling expenses: include conveyance expenses incurred by the officials. This can be treated as an administrative expense;

iii. Supplies and requisites: these refer to the uniforms and other small materials supplied to the employees, contracted staff, like uniforms supplied to sweepers, etc;

iv. Repairs and maintenance: this refers to the O&M expenditure;

v. Transportation and communication: another administrative expense;

vi. Interest payments, dividends & bonus: these refer to all the financial expenses incurred by the ULBs. This can be segregated during appraisal into debt service and other financial expenses;

vii. Grants, subsidies, contributions: these are the grants and subsidies given by the ULBs for various services provided by them; and

viii. Pensions and retirement benefits: these are payments for retired employees of the ULBs by way of pensions.

Classification of Income

The revenue income of ULBs can further be classified into two different categories as mentioned below:

i. Own revenues: These are the income which is generated by the local bodies themselves. In such revenues, the council of the local bodies has the option to increase tariffs on their own without obtaining any prior approval. While doing a balance sheet analysis, it is important to see the quantum of such revenues, which gives strength to the finances. This is discussed in detail in the forthcoming paragraphs; and

ii. All income except revenue grants given above are own revenues.

Revenue Grants

These are the grants given by the State which are linked to the Sales tax revenues of the State. Normally, the financials of local bodies are such that they are dependent on such grants. A ULB, whose revenue grant component from the State, is less than the own source of revenues they raise, has a sound financial strength, as they are not dependent on such devolutions for their day-to-day affairs, to a large extent.

The head “Revenue grants” fall under this category, and all others fall under own revenue.

Classification of Expenditure

Expenditure can be classified into four broad categories as mentioned below:

i. Establishment: this includes all personal emoluments, salary payments, pension payments and administrative expenses. All expenses incurred for running an office is treated as establishment expenditure;

ii. Operations and maintenance: these refer to the O&M expenses incurred by the ULBs for various services rendered by them to the community;

iii. Finance expenses (excluding debt service obligations): these include all financial expenses like bank charges, etc; and

iv. Debt service obligations: this head must exclusively have the debt-service obligations of the ULBs, as it gives a clear picture on the debt status of the ULBs, and how much more the ULBs will be able to borrow.

II. Financial and Operating Plan (FOP)

The balance sheet analysis, in other words, is called FOP. This term will be used henceforth in this manual many often. The balance sheet has items of two different natures: (i) revenue or recurrent in nature; (ii) capital in nature. Revenue items are the ones which occur repeatedly and frequently, like salary payments, administrative

expenses, repairs and maintenance, etc. Capital items are the ones which occur only once and there is no repetition, like construction of roads, buildings, drains, etc. Capital income and expenses are unpredictable in nature, and hence for analyzing the exact trend of income and expenses, only revenue items will be taken into consideration. There will not be any projection on capital items[12]. For doing a FOP with the revenue items, the following are the steps to be taken:

Collection of past five year's data. In order to do a reasonable projection for the future, it is required to know the past trends on the growths of various income and expenditure. In this regard, it is essential to collect the past five year's data, which will provide a reasonable data for analysis of trends; suggested format for collection of data is reproduced in table 12. This table is more suitable for local bodies.

Table 12: Suggested Data Collection Format

S.No.	Details of Account	Y1	Y2	Y3	Y4	Y5
		(Last Five Financial Years)				
Opening balance of cash /bank						
REVENUE INCOME						
General Administration						
1	Assessment tax & sales tax					
2	Licenses					
3	Fees for services					
4	Other income					
5	Revenue grants					
	Total					
HEALTH SERVICES						
6	Rental					
7	Licenses					
8	Fees for services					
9	Other income					
10	Revenue grants					
	Total					
PHYSICAL PLANNING						
11	Rental					
12	Licenses					
13	Fees for services					
14	Other income					
15	Revenue grants					
	Total					
PUBLIC UTILITY SERVICES						

[12] Capital items include capital income by way of capital grants and sub loans. Capital expenditure is amount spent on creating assets, like a water supply system, road or shopping complex. They are one-time investments. Capital expenditures are normally unpredictable and are need-based, which may arise at any point of time. Hence, it is not correct to assume a future capital expenditure. However they may be taken from the budgets for which they are available. These days CDPs are also helpful in making projections on Capital income and expenditure. If we assume a capital expenditure, corresponding capital income by way of grants and sub loans must also be assumed.

S.No.	Details of Account	Y1	Y2	Y3	Y4	Y5
		(Last Five Financial Years)				
16	Rental					
17	Licenses					
18	Fees for services					
19	Other income					
20	Revenue grants					
	Total					
WELFARE SERVICES						
21	Rental					
22	Licenses					
23	Fees for services					
24	Other income					
25	Revenue grants					
	Total					
REVENUE EXPENDITURE						
GENERAL ADMINISTRATION						
1	Personal emoluments					
2	Travel expenses					
3	Supplies, requisites assets					
4	Repairs& maintenance					
5	Transportation, communication, utility& other services					
6	Interest payments, dividends &bonuses					
7	Grants, subsidies, contributions					
8	Pensions, retirement benefits					
	Total					
HEALTH SERVICES						
9	Personal emoluments					
10	Travel expenses					
11	Supplies, requisites assets					
12	Repairs& maintenance					
13	Transportation, communication, utility& other services					
14	Interest payments, dividends &bonuses					
15	Grants, subsidies, contributions					
16	Pensions, retirement benefits					
	Total					
PHYSICAL PLANNING						
17	Personal emoluments					
18	Travel expenses					
19	Supplies, requisites assets					
20	Repairs& maintenance					

S.No.	Details of Account	Y1	Y2	Y3	Y4	Y5
		(Last Five Financial Years)				
21	Transportation, communication, utility& other services					
22	Interest payments, dividends &bonuses					
23	Grants, subsidies, contributions					
24	Pensions, retirement benefits					
	Total					
PUBLIC UTILITY SERVICES						
25	Personal emoluments					
26	Travel expenses					
27	Supplies, requisites assets					
28	Repairs& maintenance					
29	Transportation, communication, utility& other services					
30	Interest payments, dividends &bonuses					
31	Grants, subsidies, contributions					
32	Pensions, retirement benefits					
	Total					
WATER SUPPLY ACCOUNTS						
WELFARE SERVICES						
33	Personal emoluments					
34	Travel expenses					
35	Supplies, requisites assets					
36	Repairs& maintenance					
37	Transportation, communication, utility& other services					
38	Interest payments, dividends &bonuses					
39	Grants, subsidies, contributions					
40	Pensions, retirement benefits					
	Total					

Please Note: The above data should tally with the figures in the books of accounts of the Local bodies

Analysis of collection efficiency. The strength of the financials of the local bodies depends on the efficiency of collections they make. This is more relevant to the assessment rates and taxes, fees and rentals. The potential to collect shall also be verified by NCRPB based on the institutional and management structure they have for collections. Collection efficiency should be analyzed as follows for assessment rates and taxes, fees and rentals which are the own sources of income of a local body. Table 16 outlines a sample format for analyzing collection efficiency; illustration no.7 outlines the methodology for this.

Illustration 7.Methodology for Analyzing Collection Efficiency

Collect data on actual amount to be collected: this is the "Demand".

Collect data on actual amount collected: from the books of accounts of the local body

Collection efficiency = Actual collection / Demand; this gives the % of amount collected

The above analysis of collection efficiency would need to be done for each of past five years.

Calculate the average of collection efficiencies of the last five years. This is the average collection efficiency which can be extrapolated during projecting collections for the future

Table13: Sample Format for Analyzing Collection Efficiency

Particulars	Y1	Y2	Y3	Y4	Y5
Assessment rates & taxes					
Actual demand (A)					
Actual collections (B)					
Collection efficiency (C)=(B/A)					
Average collection efficiency	AVERAGE of column (C)				

Composition analysis. The share of each item of income and expenditure should be worked out, in order to know the % of own revenues and assigned revenues, with respect to revenue income and the % share of establishment, debt service and other expenditures. This gives an overview of the performance of the local bodies with respect to expenditures and also potential for growth in revenues. Table 17 outlines a sample format for undertaking composition analysis.

Table 14 : Sample Format for Undertaking Composition Analysis

Particulars	Y1	Y2	Y3	Y4	Y5	Average
Revenue Income						
Own revenues (A)						
Revenue grants (B)						
Total revenue income (C)=(A+B)						
Revenue Expenditure						
Establishment (D)						
Operation & Maintenance (E)						
Finance Exps. (F)						
Debt-Service (G)						
Total Revenue expd. (H)=(D+E+F+G)						
Composition of income						
(A/C) –Own rev.						Average (Y1..Y5)
(B/C) – Rev. grants						Average (Y1..Y5)
Composition of						

Particulars	Y1	Y2	Y3	Y4	Y5	Average
Expenditure						
(D/H)- Establishment						Average (Y1..Y5)
(E/H) – O&M						Average (Y1..Y5)
(F/H) – Finance expd..						Average (Y1..Y5)
(G/H) – Debt-service						Average (Y1..Y5)

Trend analysis. The past trends are analyzed in order to look at the behavior of each item of income and expenditure. The formula for doing a trend analysis is:

(Y2-Y1)/Y1, where, Y2 is the second year and Y1 is the first year.

This should be done for the last five years. An average of the trend will be worked out based on which future projections will be made. Normally in balance sheets of ULBs, there are possibilities that there will be an abnormal increase or decrease in an income or expenditure due to unforeseen income or expenditure. In such cases, the year where abnormality occurs should be left out for the purpose of calculating the average, as it will lead to misleading results. A simple illustration will explain the trend analysis.

Illustration 8: Sample Trend Analysis

The assessment rates of a ULB is Y1: Rs.2 mn ; Y2: Rs.3 mn., Y3: Rs.17 mn., Y4: Rs.6 mn.; Y5: Rs.5 mn.

Calculation of Trend Analysis

Particulars	Y1	Y2	Y3	Y4	Y5	Average
	(1)	(2)	(3)	(4)	(5)	(6)
Assessment. rates & taxes	2.00	2.25	7.00	4.00	5.50	
Trend (*)		12.5%	211.1%	-42.9%	37.5%	2.4%

* Trend is calculated as follows: Year 1: (Y2-Y1)/Y1; Year 2: (Y3-Y2)/Y2; Year 3: (Y4-Y3)/Y3; Year 4: (Y5-Y4)/Y4.

Average: since Y3 has an abnormal increase as compared to other years, this year is removed for working out the average and the average of other years works out to 2.4%. This is the basis for making future assumption on growth in assessment rates

Listing Assumptions. Based on the trends calculated above, assumptions should be listed for each item of revenue income and expenditure. A minimum growth from the trends will be a reasonable assumption. For the example quoted in (iv) above, the reasonable assumption on rate of growth of assessment rates and taxes would be 2.5% or a maximum of 3%, based on the potential growth of the town which can be taken from the DPR, or based on innovative mechanisms proposed by the ULB.

Collection of Loan Data. Before sanctioning a new loan, NCRPB would need to collect information on the present debt status of the ULB. The details should contain information on individual loans taken by the ULBs, rate of interest, loan tenure, amount to be paid etc. Table 15 outlines sample format for collection of data on debt status.

Table 15: Sample Format for Collection of Data on Debt Status

S. No.	Loans taken from	Loan Amount	Interest Rate	Loan taken during the year	Loans paid		Loan Balance		
					Principal	Int.	Principal	Int.	Total
1									
2									
3									
4									
	Total								

It is sufficient if the required information is obtained on the above format duly filled in for the latest financial year

Projection of individual heads of income and expenditure. Projections are made in order to analyze the future potential of the ULBs with respect to debt repayments and strength of its financials. It is, therefore, preferable to project revenues and expenditures for the next 10 years till the sub loan period ends. For doing this, the amount mentioned in the last year of data received must be extrapolated with the assumed percentage.

Taking the example of above, an illustration of calculation of projections has been done.[13]

Illustration 9.Calculation of Projections of an individual head of account

The average rate of growth of assessments and taxes is 2.4%. The assumption on growth is 3%. The future projection will be as follows:

Particulars	P1	Y1	Y2	Y3	Y4	Y5
Assessment	5.50	5.66	5.84	6.01	6.20	6.38
Taxes and Rates						

P1 refers to the previous year (latest year of the actual data collected)

Projection is done as follows:

Y1 = P1 + (P1 * 3%), or, P1 * 103%

Y2 = Y1 + (Y1 * 3%), or, Y1 * 103%, and so on.

While making a projection, the actual debt obligation of the subproject has to be taken into consideration with respect to projecting the finance expenses (debt-service).

III. Interpretations of balance sheet

Once you have made all the required projections, you will be required to finally take a decision regarding funding. The ratios will help you in deciding this. The result of the projections made by you can be identified. After doing all projections, the results can be identified by working out the ratios. These are mentioned below:

i. **Total Expenditure/Total Income (TE/TR):** This relates to revenue income and expenditure. The rationale behind this ratio is that expenses should not exceed income. Therefore, expenses should be equal to income (ie., 100%) or less than that (<100%). If expenses exceed 100%, it means that the ULB has ended up in a deficit. The TE/TR should be worked out for the latest 5 years. To remind again, financial data has to be collected for last five years. It makes more sense to work out for the past 5 years, as it gives a picture on the surplus for each year. In cases where TE/TR is less than 1 in some of the past five years, an average can be worked out, and it is acceptable if the average TE/TR is less than 1.

TE/TR should be less than 1

ii. **Debt-Service/Total Revenue Income (DS/TR):** This provides information on the percentage of debts to revenue income. The rationale behind this ratio is that, ULB's expenses like establishment which averages around 40-50%, repairs and maintenance around 15-20%. So, it is advisable that the debts do not go beyond 30%. If it goes beyond 30%, it will mean ULBS/ STATUTORY BOARD is left with small surplus to meet other expenditures. Therefore, NCRPB should ensure that DS/TR should not exceed 30%[14].

DS/TR should be less than or equal to 30% of revenue income

Balance sheet is said to be viable if they fall within the criteria mentioned above.

[13] For the purpose of illustration in the manual, projections are done for next 5 years. Normally it is advisable to do for the next 10 years

[14] This is arrived based on certain assumptions mentioned in the para. However, this can undergo a change, if a clear picture of composition of expenditure is arrived in common for all the local bodies in the NCR region.

ANNEX 7: MODEL SUB LOAN SANCTION LETTER

To
Sir(s)

Sub: Sanction of financial assistance in the form of the Sub loan for …….(name of the Subproject)

Ref: Project proposal and Sub loan application dated……. forwarded by ……and further correspondence dated……. and discussions with the officials ……

With reference to the above, NCRPB is pleased to provide a loan of Rs…….. (Rupees……) for implementation ……..(name of the Subproject) in ……(name of the ULB).

1. The Sub loan terms are:

Rate of Interest:

Amortization Period:

2. The detailed terms and conditions of the Sub loan sanction are set forth in the Sub loan Agreement and Guarantee Agreement of the State annexed hereto. The ……(name of the ULB) should enter into a Sub loan Agreement and tripartite Escrow Agreement, to the satisfaction of the NCRPB.

3. The Sub loan sanction may kindly be placed before the Council / Board of ……(name of ULB / Statutory Board) and furnish a certified copy of resolution accepting the terms of conditions of the Sub loan and authorizing the officials to execute the agreement and other documents for availing the Sub loan.

4 This sanction is valid for a period of 60 days from the date of its receipt. If the …….(name of the ULB / Board) fails to communicate its acceptance and execute agreements and documents as may be required within 60 days from the date of its receipt, the sanction stands cancelled automatically, without any further communication from the NCRPB. The NCRPB reserves the right to extend the period of validity.

Kindly acknowledge the receipt of this letter.

ANNEX 8: TERMS OF REFERENCE FOR SUPERVISION CONSULTANTS

A model TOR developed in TNUDF is given, which may be improved and followed

TERMS OF REFERENCE
CONSULTANCY FOR CONSTRUCTION SUPERVISION OF
THE PROPOSED ROADS AND STORM WATER DRAINS IN
TIRUVANNAMALAI MUNICIPALITY

Introduction

Tiruvannamalai is a selection grade municipality spread over an area of 13.64 Sq.km and is located at a distance of 190 km south west of Chennai. The population of the town is 1,30,376 as per 2001 census. There will be a floating population of about 20,000 per day since this is a pilgrim town. The municipality maintains 73.026-km length of various types of roads. It is proposed to resurface some of the roads with Black Topping and provide storm water drains as covered in the City Corporate Plan of Tiruvannamalai Town.
The total estimated cost for BT roads is Rs. 317.13 lakhs and for storm water drains is Rs.172.18 lakhs.

Tiruvannamalai Municipality has now approached TNUIFSL to appoint a consultant to undertake the construction supervision of the proposed Roads and Storm Water Drains.

In this connection it is proposed to appoint a consultant for providing construction

supervision for the above works.

Objective

The consultant shall aid the Tiruvannamalai Municipality in the bidding process, in line with the Asian Development Bank procedures, leading to the award of contracts for providing BT roads and storm water drains. The consultant should supervise the works in order to ensure time bound completion of the works to the specifications laid down in the bid documents. They will also be responsible for other project management related activities.

Scope of the assignment

The scope of the assignment covers the entire Tiruvannamalai Municipal limits. The consultant will perform all acts as are normally performed by a regular Engineering Division of a government department headed by Assistant Executive Engineer / Executive Engineer/ Superintending Engineer and will include the following:

1. Scrutinize the bids received by the municipality, prepare Bid evaluation report and submit to ULB with recommendations.

2. Finalize Contract Agreements to be signed by ULB and the contractors. In consultation with the contractors fixed for the works, (a) draw up project budget with monthly targets, (b) prepare network analysis such as CPM/PERT, for purposes of effective project monitoring and furnish the same to the clients.
3. Assist the ULB in obtaining utility diversions, connections and any clearances from different service departments such as Telephone and electricity departments for the purpose of executing the works.
4. Supervise construction works from start to finish by using the modern methods of control. Verify the setting out of the works done by the contractors and ensure that it is as per drawings. Ensure that the works adhere to the levels, alignment and dimensions specified in the drawings approved by the client.
5. Supervise the works to ensure conformance of construction works and materials to relevant IS standards/ Bid specifications/drawings. Approve materials and quality of works based on test results produced by the works Contractor. (Quality control)
6. Record measurements in measurement books at various stages of works, carry out check measurement, prepare bills and certify payments, based on recorded measurements. In case of such of those works where measurements are hidden after completion, as in the case of foundations, reinforcements in RCC structures etc. check measurements are to be carried out immediately after each activity is completed.
7. Monitor progress with reference to pre-fixed targets drawn up jointly with the Contractors and furnish monthly progress reports in the formats as decided in consultation with the ULB/TNUIFSL
8. Advise on extra claims and time extension on works contract. In case of any new items of works prepare specifications, carry out rate analysis (with supporting documents) for justifying/negotiating the rates quoted by the contractors and furnish these to the client for their approval.
9. Ensure environmental and social safeguards as per the EAR developed by TNUIFSL
10. Co-ordinate with all concerned agencies.
11. Ensure strict observance of labor laws by the contractor.
12. Inspect and certify that the works are completed according to the specifications on final completion before final settlement of bills.
13. Prepare as-built drawings and completion report for all the works.
14. Inspect all the completed works once a month during defects liability period of one year and assist the ULB in ensuring that the contractors attend to all kinds of construction defect brought to their notice.
15. Prepare periodic Statement of Expenditure in the Asian Development Bank format for getting reimbursement of expenditure.

Abstract of the work estimates

S. No.	Description of item	Estimated Cost(Rs)
1.	Providing BT surface to various streets (Total 90 works)	3,17,13,000/-
2.	Providing storm water drains in various streets (Total 71 works)	1,72,18,000/-

Total Rs. 4,89,31,000/-

.

Expected schedule of completion of tasks:

The main activities/events and the scheduled time of completion of these activities/events from LOI date are as follows:

S. No.	*Activities/Events*	Time from LOI in days
1.	Bid evaluation, submission of recommendations, drafting & Signing of Agreement	30
2.	Supervision of works etc	120

Data, services and facilities to be provided by the client:

The Municipal Commissioner / Engineer, Tiruvannamalai Municipality, will provide the estimates, drawings as approved by the competent authority and bid documents received from the contractors as well as details pertaining to the site.

Final outputs:

The consultant shall furnish the following documents during the course of the work:

- Bid Evaluation Report (3 Copies for each of the works)
- PERT/CPM chart & project budget
- Monthly progress report (3 copies)
- Quality check reports (3 copies)
- Scheme completion report including as-built drawings (3 Copies)
- ESR compliance report (3 Copies)
- Periodic Statement of expenditure

Composition of review committee and procedure for review

A review committee consisting of the following members will review the progress of work periodically once in a month and communicate the recommendations to respective organizations for adherence.

- Municipal Commissioner / Municipal Engineer, Tiruvannamalai Municipality.
- Advisor (Roads)/TNUIFSL, Chennai.

9. List of key professional positions whose C.V. would be evaluated.

S.No	Position & No	Experience & Qualification
1	Project Manager -1 No.	A graduate in Civil Engineering with about 10 years experience in implementation of Civil works such as Roads and storm water drains
2	Project Engineer –1 No.	A graduate in Civil Engineering with about 7 years experience in the fields mentioned above

10. Minimum support staff needed in the field during execution

S.No	Position & No	Experience & Qualification
1	Site Engineer - 2 Nos.	Graduate in Civil Engineering with about 5 years experience in implementation of Civil works such as Roads and storm water drains
2	Site Supervisor–3Nos and as required.	Diploma holder in Civil Engineering with about 3 years experience in the fields mentioned above

11. Payments

Payments shall be as per the quotation to be given in the financial proposal according to the schedule given in clause 11.1 below. However it may please be noted that there shall be no payment during the defects liability period, the cost of which will have to be factored in while giving the quotes.

11.1 Schedule of Payments

The fee quoted for the Project Management will be paid as follows:

- 10% of the fee quoted on completion of the activities up to Signing of the Works Contract by the ULB and the Contractors on a prorata basis with respect to the number of works. If contract is not finalized for some of the works after furnishing the evaluation report and re-bids are called for due to some other reasons or there is no response by the contractors, then the consultants have to carry out the tasks 3.1 and 3.2 again for those works without any extra cost. However, such works are expected to be very minimum.
- 70% of the fee will be paid over the period of completion of all the works. This will be in proportion to the payments made to the contractors towards progress or completion of works.
- 20% on submission of final bill, completion report and as-built drawings for all the works

ANNEX 9: MODEL PROGRESS REPORT

A model Progress Report for sewerage scheme prepared for a subproject in Tamil Nadu is placed below for reference

	<Name of the project>					
Progress as on _____						
	PKG1	**PKG2**	**PKG3**	**Means of finance**		
Contractor Name				**Rs. In Lakhs**		
Contract Value					**Sanctioned**	**Disbursed**
Date of Agreement						
Date of Completion				Loan		
Coll. System				Grant		
Stoneware(BOQ)				Own		
Target this month				Others		
Achievement this month				**Total**		
Cumulative target						
Cumulative achievement						
Cumulative %				SOE received		
RCC (BOQ)						
Target this month						
Achievement this month						
Cumulative target						
Cumulative achievement						
Cumulative %						
PS/LS/LM						
BOQ						
Present Status						
Pumping Main						
BOQ						
Target this month						
Achievement this month						
Cumulative target						
Cumulative achievement						
Cumulative %						
Decision on Last Meeting:				**Action Taken:**		
Comments:						

ANNEX 10: MODEL STATEMENT OF EXPENDITURE

Expenditure Details
Name of LA:
Project:
SOE No.:

Year/ Month	Payment S.No.	Voucher No.	Purpose	Bill Amt.	Deduction		Net Expre.	Sub-total
					Withheld	Others		
1	2	3	4	5	6a	6b	7(5-6)	8
	Total							

Note:

- **The table provides expenditure details with list of documents to be enclosed [(copies of paid vouchers duly supported by copies of bills (showing value of work, contractor's signature, pass order, amount paid, cheque number, date, name of the bank and stamped receipt), other documents (all documents duly attested)]**
- **Col 2 – The payment serial number is to be indicated at top right of the copy of voucher for easy referencing / checking**
- **Col 8 – This sub total indicates total reimbursement claimed for the project so far**

Signature

Seal

ANNEX 11: FORMAT OF LOAN DISBURSEMENT MEMO

FORM 3: LOAN DISBURSEMENT MEMO

1.	**PROJECT DETAILS**	:	
	Name of the ULB / Board	:	
	Name of the State	:	
	Name of the Contact person	:	
	Cheque Favouring	:	
	Loan Codes (system Codes, if any)	:	
	Total Cost	:	
	Loan sanctioned (in Rs.)	:	
	ULB / Board Source (in Rs.)	:	
	No. of disbursements of loan	:	
	Grant (if any) (in Rs.)	:	
	Loan released so far (if any) (in Rs.)	:	
	Amount applied for release (in Rs.)	:	
	Amount yet to be disbursed (in Rs.)	:	
	Expenditure incurred & physical progress achieved by the agency justifying the release now applied for	:	
	Rate of Interest	:	
	Rate of penal interest Moratorium Period for Interest for Principal No of Instalments (for repayment)	: : 	
2.	Date of issue of sanction letter	:	
	Date of execution of Loan Agreement	:	
	Agreement Value	:	
	Type of security	:	
	Date of receipt of security	:	
	Details of Bank Accounts (Escrow) Bank A/c No.	: 	

	Opened On Date of letter issued to Bank as Standing instructions		
	Date of completion of legal documentation	:	
	Whether land is in possession (if no, reasons therefor)	:	
	Whether all sanction conditions complied with (if any condition not complied with, the reasons therefor)	:	
	Whether the agency has requested for waiver of any conditions, enumerate the same. If yes, specific recommendations along with reasons.	:	
	Arrears position of the borrower as on date of date of disbursement	:	
	Physical progress of work, if any (in percentage) as on date of request for release of instalment	:	
	Financial progress of work, if any (Rs. in lacs) as on date of request for release of instalment	:	
3.	Site Inspection Report	:	
	If the scheme has been revised since documentation, indicate the revised subproject cost, loan amount and drawal/repayment (to be enclosed)	:	
	Whether the revision has been approved by the Competent Authority & Date of approval	:	
	Any running condition at this stage is required to be complied with, give details	:	
	Is there any cost over-run (if yes, reasons thereof and sources of additional funds Required for completion of the scheme)	:	
	Scheduled date of commissioning of the scheme	:	
	In case of deviation, revised date of Completion	:	
	Whether Completion Report is submitted or not (if not, when will it be submitted)	:	

4.	All the requisite formalities have been complied with by the agency for considering the release(s)	:	
	Required level of expenditure for release (Rs. in lacs)	:	
5.	Advance Stamped Receipt	:	Received
6.	Comments if any	:	

Disbursement approved for Payment

FOR ACCOUNTS USE ONLY

CHEQUE NO.	:
CHEQUE AMOUNT	:
CHEQUE DATE	:

Forwarded to	:	Accounts Department
To	:	COF
From	:	…….. (Projects)
Date	:	

Passed thro'-

ANNEX 12: FORMAT OF COMPLETION / UTILIZATION CERTIFICATE

Model Format of Completion Certificate and Utilization Certificate

…….[Name of department / ULB / Agency]

……..State

COMPLETION CERTIFICATE

Name of the Scheme :

Estimated Amount (Rs.) :

Administrative Sanction accorded on :

Administrative Sanction accorded by :

Technical Sanction accorded on :

Technical Sanction accorded by :

Amount released by NCRPB so far :

Certified that the work has been completed in all aspects and the total value of the work done was Rs……..(Rupees in words).

Date :

Place :

Authorized Signatory

…….[Name of dept.]

ANNEX 13: CRITERIA FOR FINANCIAL ASSISTANCE OF BORROWERS

Introduction

1. NCRPB rules empower the Board to sanction assistance to participating state governments, urban development authorities, housing boards and such other authorities of the state government for implementing the sub-regional plans and project plans or for developing the counter-magnet area. The borrowing entities therefore are the local (sub-national) authorities/governments, urban development authorities, statutory bodies set up by the state governments, the utility boards or corporations and special purpose vehicles sponsored by the above.

2. It is therefore essential to identify the broad parameters to assess creditworthiness of the borrowers over and above the detailed project evaluation for the projects sponsored by them. This evaluation is part of the three tier credit appraisal process which looks at the project risks, borrower creditworthiness and finally credit enhancements and security mechanisms structured for the specific borrowing program from NCRPB. The following sections attempt to outline these parameters for different classes of borrowers..

Local Governments

3. It is essential to assess the powers of the local governments to borrow money, to review whether prior approval/sanction of the [state] government is needed from time to time to borrow or re-borrow and take upon itself the interest liability arising out of term loans or bond issuances. Provisions of the governing act relating to repayment of loans, permissible security to lenders against loans such as establishment of sinking fund also needs to be reviewed.

4. Typically a statement of account for a local government comprises of revenue account and capital account. The major sources of revenue income are Octroi (where levied) & Toll Tax, municipal taxes, tax and fees from services, receipts from provision of infrastructure services such as water and sewerage works, grants and contributions and miscellaneous income.

5. Expenditure on revenue account comprises expenditures on water supply services, education, conservancy, street lighting, general administration including salaries and fire services, public works and debt servicing including interest payments and contributions to sinking fund. Capital inflows on capital account comprise of grants, loans and sale of assets. Capital expenditures are on account of creation of infrastructure assets and principal repayments. The revenue account needs to be assessed for availability of operating surpluses for debt servicing (measure of operating efficiency and ability to support capital expenditure through own revenues).

6. An assessment of trends in revenues and expenditure and reasons for variations if any, needs to be carried out. Proportion of non-tax revenues in the overall revenue base, level of dependence on state governments for fiscal transfers, extent of cost recovery and expenditures incurred in operations and maintenance are some important parameters that need to be evaluated.

7. A review needs to be undertaken of the debts outstanding for the local governments. Indicators such as Debt Service Coverage Ratio (DSCR) and Interest Coverage Ratio (ICR) needs to be computed.

- Typically such indicators should have a value of at-least 1.25 on a year-over-year basis.
- Lower values indicate that the local body does not have the ability to support the borrowing program and additional credit enhancement measures in the form of guarantees, debt service reserve accounts etc need to be provided for.

8. The following financial indicators need to be computed as part of the financial analysis of the local government.

Sl.	Indicators
1	Operating Ratio (Total revenue receipts/Total revenue expenditure)
2	Non tax receipts / Total revenues
3	State Government grants / Total revenues
4	Operating Surplus (Deficit) / Total revenue receipts
5	Establishment expenditure / Total revenue expenditure
6	Non debt capital receipts / Total capital expenditure
7	Outstanding liabilities / Total revenues
8	Debt Service Coverage Ratio (Operating Surplus + Balances in sinking fund) / (Annual Debt Servicing)
9	Interest Coverage Ratio (Operating Surplus) / (Annual Interest Payments)

Utilities and Statutory Boards

9. Utilities/Statutory Authorities/Boards entrusted with infrastructure provision: state governments often set up a nodal agency or a statutory authority or a Board which is responsible for provision of specific infrastructure services such as power generation, water supply & sewerage services in the state. This utility is the predominant agency for asset creation and operations and maintenance thereof across urban and rural areas.

10. The analysis of such borrowers should include existing financial position, future financial profile, cash flow adequacy, trends in revenues from operations, an analysis of cost and profitability, interest coverage ratios, return on capital employed and an analysis of debt outstanding and track record of timely debt servicing.

11. Analysis of the revenue account / profit & loss (in case of corporate entities) needs to be carried out for the immediate preceding five years and financial projections need to be drawn up for the next five years. In the P&L account, the composition of the revenues in terms of volumes and per unit realizations needs to be analyzed. The overall operating profits (Profits before depreciation, interest and taxes) in relation to the revenues and emerging trends over the analysis period (typically 10 year periods) need to be undertaken.

12. The following financial ratios need to be computed as part of the financial analysis of these state-owned entities.

Sl.	Indicators
Profitability Ratio	
1	(Profit Before Interest Depreciation Taxes) / (Operating Income)
2	(PAT or Surplus after debt servicing and depreciation) / (Total Income)
3	Average Revenue Realization per unit
4	Average Cost Incurred per unit
5	Return on Capital Employed (ROCE) (Operating revenues-Operating expenses)/(Total Assets – Current Liabilities)
Solvency Ratio	
6	Gearing Ratio (Debt or Borrowed Resources)/(Equity or own capital + internal accruals)
7	Interest Coverage Ratio (Earnings before depreciation, interest and taxes) / (Interest Expense)
Liquidity Ratio	
8	Current Ratio – (Current Assets) / (Current Liabilities)
Turnover Ratio	
9	Average Collection Period
10	Working Capital Turnover Ratio

State Industrial Development Corporations (SIDC)

13. NCRPB also provides loans to SIDCs for land acquisition and provision of infrastructure services in industrial estates. SIDCs are typically involved in creating and managing industrial estates and providing term loans and equity support from State Governments to small and medium sized industrial enterprises in the State.

14. A financial analysis of SIDCs would involve a detailed analysis of revenues from different operating sources to understand their sustainability. In addition, level of support from State Government in the form of equity infusions and guarantees for debt need to be studied. The following ratios are required to be computed As part of this analysis.

Sl.	Indicators
1	(Profit Before Interest Depreciation Taxes) / (Operating Income)
2	Return on Capital Employed (ROCE) (Operating revenues-Operating expenses)/(Total Assets – Current Liabilities)
3	Cost of Capital
4	Net Spread (difference between lending rates and borrowing terms)
5	Gearing Ratio (Debt or Borrowed Resources)/(Equity or own capital + internal accruals)
6	Interest Coverage Ratio (Earnings before depreciation, interest and taxes) / (Interest Expense)

Development Authorities

Typically, Development Authorities are engaged in planning activity for new areas and area development. The planning activity includes preparation of development plans for the city and individual scheme plans as per existing bye-laws and approval of development plans for housing schemes/buildings. The development functions include acquisition of land, formation of layouts/schemes to provide for residential, commercial and civic amenity sites and construction of commercial complexes, houses and flats.

15. The following indicators may be computed for the past five years for Development Authorities. Projections need to be carried out, estimating the land bank acquired and in possession of the authority, extent of leveraging involved in land acquisition and site development and liquidity cushion available with the authority.

Sl.	Indicators
1	Revenues from sale of sites / Total Revenues
2	Total Debt / Net Worth
3	OPBDIT / Revenue Receipts
4	Loans / Capital Expenditure
5	Cash and Bank Balances / Total Assets

State Government Departments

16. Typically, state government departments such as Public Works Department (PWD) or Public Health Engineering Department (PHED) are part of the state government and their finances are consolidated with that of the state. It is important to analyse the budgets allocated to these departments and ensure that liabilities incurred for capital expenditures undertaken by these departments are properly accounted for by the finance department.

State Government Ratings

17. NCRPB has exposure to state government departments which are inherently the arms of the state government, where . A NCRPB lends to state entities which have explicit guarantees from the state government as a form of credit enhancement. As NCRPB deals with only four state governments, it is recommended that NCRPB engage its existing rating agencies to carry out a detailed credit assessment of these state governments.

18. Based on above criteria, it is recommended that NCRPB staff involved in appraisal carry out sample analysis of existing and new borrowers. These criterions can be fine tuned based on the initial experience.

ANNEX 14: REHABILITATION OF NAVALGUND TO KUSTAGI ROAD PROJECT (INDIA)

Introduction

There is increasing recognition that the quality of a country's infrastructure is an important determinant and prerequisite for economic development. Roads, both urban and rural, are key components of the infrastructure system in a country. Similarly, government operated transport services allow the low income group population to have access to economic mode of transportation.

The project appraisal must ensure that the present value of the sum of all the economic benefits from the road exceed the present value of the costs. Typically, there will be no financial cash inflows, unless there are toll charges for the road. Thus, the financial NPV (Net Present Value) will be negative. For a toll road, the government has to regulate the toll structure of the operator of the toll road. This is to ensure that the investor receives a reasonable rate of return and at the same time make sure the users are not charged excessive tolls. In many urban places, the existence of traffic congestion is clear evidence of the demand for new roads. In rural areas, the main criterion for new road projects is the need for additional connectivity which depends upon the villages and the population that do not have road access.

Main Economic Benefits

If a toll is charged for the road, it is also an indication of the consumers' willingness to pay for the services or the economic benefits derived by the users. However, most developing countries do not charge a toll and the economic benefits have to be estimated indirectly. Good road projects generate the following key economic benefits:

- Decrease the travel time for users and reduce congestion;
- Decrease the delivery time for goods and services;
- Reduce the annual vehicle operating costs (VOC); and
- Increase safety and comfort in travel and reduce accidents.

Travel Time for Users

With a good road, travelers and transporters take less time to complete their journeys. The time savings is valuable to the users of the road. To measure the economic benefits in monetary terms, we have to estimate the opportunity cost of the time for the different categories of users and the purposes of the trip. In other words, how much do the users value their time savings?

There will be great diversity in the types of users: trucks, buses and private vehicles. Also, the value of the time savings will depend on the timing of the trips. The value of the time saving is measured by the income of the population group for whom the time savings occurs. Also, one has to distinguish between the value of working time and the value of nonworking (or leisure) time. As a rule of thumb, the value of nonworking time

is approximately 30 percent of the weighted average of the value of the working time for the users of the road. If there is a comparable road that is currently charging a toll, then the toll charge may be an approximate assessment of the value of the time savings from using the road. If there is no comparable toll road, then we must rely on other survey information that measures the willingness to pay of road users.

Delivery Time for Goods and Services

A good road reduces the delivery time for goods and services. It lowers the cost for the existing providers of goods and services. In addition, it may encourage the production of new goods and services. In the absence of information, we may add up the value of the vehicle cost, the time value for the driver and the occupants of the vehicle.

Annual Vehicle Operating Costs (VOC)

The quality of the road affects the annual vehicle operating costs (VOC). One has to estimate the reduction in the maintenance costs for different types of vehicles.

Reduction in Accidents

A good road will increase safety and lead to a reduction in accidents. However, it is also true that when roads are good some drivers indulge into speeding and that may increases the chances of accidents.

Risks of Road Projects

In a road project, one of the key risk variables is the traffic projection over the life of the project.

One must ensure that the estimates are reliable and realistic. Another key risk variable is the value of the time saved. The traffic projections should be disaggregated by the type of vehicles, time of day and the professions of the occupants in the vehicles. If there are toll charges, then it is important to accurately estimate the willingness to pay (WTP) of the travelers. To ensure that the forecasted economic benefits of the road, in terms of time savings and reduction in VOC, are realized over the life of the project, the promoters of the road project should make the necessary financial arrangements for the investments during the investment period and the maintenance costs during the operations phase. Otherwise, the economic benefits will be reduced from the delays due to the nonavailability of funds during the investment period, and the deterioration in the conditions of the road during the operations phase due to the lack of maintenance.

Road Maintenance

If no tolls are charged for the road project, then the elements of the financial Net Cash Flow

(NCF) profile will be negative, consisting of the cash outflows during the investment period and the expenditures on operations and maintenance. Often the rates of return on road maintenance projects are very high and may be higher than the returns on new roads.

Public Private Partnerships on Road Projects

In some cases, the demand for a road project may be sufficiently high to attract private sector participation. With private equity participation, the toll structure should provide a fair return to the equity investor, taking into account the risks of the road project. For example, in some cases, the road project may be sanctioned on a Build Operate Transfer (BOT) basis. With project finance, the equity investor has recourse only to the cash flows that are generated from tolls with the road project.

Outcome of Analysis

The calculations show that the road rehabilitation project is financially nonviable while economically it is very attractive. Thus, the outcome of the analysis conforms to the normal pattern of results of such projects.

Conclusion

Roads are an integral part of the infrastructure system in a country, and contribute to economic development by creating benefits in terms of time savings for the users and reduction in vehicle operating costs.

Case Study: Rehabilitation of Navalgund and Kushtagi Road Project

It is well understood that roads lead to the prosperity. Roads lead to mobility and mobility is important requirement for economic growth in any country. Economic activities flourish in areas where accessibility is good and mobility is fast. At present, different types of roads that exist in the State are National Highways (NHs), State Highways (SHs), Major District Roads (MDRs), Other District Roads (ODRs) and Rural roads (RRs). The total length of first three types of roads is around 52,000 kms.

There has been about 10 to 12 percent increase in traffic each year. On SHs, the annual growth of traffic has been about 12 to 15 percent. The traffic on village roads and other district roads has also registered an increase of 10 to 12 percent per annum. Not only does the existing road need widening and strengthening to match the current and future traffic demands, but new roads also need to be constructed to improve accessibility, reduce distances and decongest existing roads.

Nearly 71 percent of SHs is single lane, 22 percent is intermediate lane and only 7 percent is two-lane in Karnataka. Among the MDR, 98 percent is single lane while 2 percent is wider than single lane. Almost all the SHs (99.9percent) are surfaced while only 65 percent of MDRs are surfaced. Almost all the village and rural roads is single lane and unsurfaced.

A sustained program of road development, rehabilitation and maintenance needs to be quickly initiated not only to minimize the diseconomies and regional imbalances but also to ensure that the desired economic growth is not constrained by a poor road infrastructure. The State’s allocation is about INR 1, 000 million annually for repairs and

maintenance of PWD roads. 80 percent is earmarked for resurfacing and about 1500–2000 kms can be surfaced out of nearly 40,000 kms.

Project Description

The current project involves rehabilitation (i.e., improving/widening the existing road to a minimum width of 5.5m) of the road from Navalgund to Kushtagi (97 kms long). Part of the
road (25.6 kms) is MDR, while the remaining section (71.4 kms) is part of SH30 .The project
road runs predominantly on black cotton soils mainly the section between Navalgund to Belavaniki (MDR) and Belavaniki to Gajendragarh (SH 30). The project road connects to National Highways NH 218 (Bijapur-Hubli) at Navalgund and NH 13 (Sholapur-Mangalore) at Kushtagi. The project road is entirely a single lane carriageway with some selected sections in village and urban limits having widened to intermediate lane width of 5.5m. The proposed widening of the road will establish a good connectivity to major commercial places in the state such as Hubli and Dharwad. Brief details of the project are as follows:

Road Characteristics

Total length of the road is 97 kms. Its width will be made uniformly to 5.5 meters.

Total Investment and Financing Arrangement

Total investment cost is expected to be INR 4660 lakhs. 80 percent of the investment cost will be raised as loan. The component of bank loan is expected to be INR 3728 lakhs. The remaining amount of INR 932 lakhs will be provided by the government as its equity contribution. INR 4060 lakhs that comes to 87 percent of the total investment cost will be the base cost. INR 500 lakhs or 11 percent of the investment cost will be for physical contingencies and INR 100 lakhs or 2 percent of the investment cost will be the cost of the supervision of the project. The construction period is two years. 40 percent of the cost will be spent in the first year while the remaining 60 percent will be spent in the second year. In the first year, the base cost will be INR 1624 lakhs while in the second year it would be INR 2436 lakhs. Similar proportion will be spent for physical contingencies and supervision. The Bank will charge an interest of 12 percent on this loan. The repayment period of the loan will be 8 years starting from the year of commission of the project (year2).

Axle Load Survey

The intensity of traffic loading and the corresponding damaging factor for commercial vehicles is an important parameter for the design of pavements. The government has not carried out axle load surveys through portable weighing system. So the recommendations of the Indian Road Congress -37 that provides the indicative VDF values as given. Operations and maintenance cost is calculated by dividing the vehicle damaging factor by 500.

Table 1: Indicative VDF Values

Commercial Vehicles	Plain	Rolling
0-149	1.5	0.5
150-1500	3.5	1.5
Above 1500	4.5	2.5

Operations and Maintenance

Operations and maintenance costs include patching, annual and other maintenance, overlay, edge repair and crack sealing. The cost per square meter for patching in annual maintenance will be INR 300. The cost of other maintenance will be INR 167 per square meter. The overlay will cost INR 181 per square meter while crack sealing and edge repair will cost INR 8 and INR 53 per square meter, respectively.

Working Capital Requirements

The toll will be collected on the spot and hence the amount receivable will be zero. The amount payable will also be zero. The project will however require 8 percent of the Operations and Maintenance expenses as cash balances.

Traffic Survey Results

In the Planning, design, operation and management of a highway system, an appreciation of the traffic characteristics is one of the basic requirements. The base year (2003) traffic characteristics of the project road corridors starting from Navalgund (Km 0/0 of MDR) to Kushtagi (Km 64/1 of SH 30) were assessed through primary surveys supported with data collected from secondary sources. Based on the traffic survey data and secondary data related to social and economic development of the influence area, the traffic growth rates for various modes of vehicles were derived for the design life period. Accordingly, the traffic forecast figures had been finalized.

The following traffic surveys were carried out:

- Traffic volume count surveys at four locations for three days;
- Origin and destination surveys for 24 hours at two locations;
- Axle load survey at one location for 24 hours; and
- Journey time, speed and delay studies over the entire project road.

The results of the survey were as follows:

Table 2: Average Daily Traffic Breakdown Per Vehicle

Average Daily Traffic at Base Year	Number	Growth Per Annum
Two Wheelers	479	8.8%
Car/Jeep/Van	250	8.3%

Three Wheelers	122	8.3%
Mini Bus	59	7.2%
Bus	123	7.2%
Light Goods Vehicle	49	7.6%
Two Axle	148	8.6%
Three Axle	34	7.9%
Multi-Axle	17	11.6%
Agri-tractor	70	0.0%
Non-Motorized Vehicle	324	0.0%
Total Vehicles	1676	

The project road was divided into four homogeneous sections based on preliminary reconnaissance studies in such a way that the traffic intensity within a particular section would be more or less uniform. These sections are as follows:

1. HS1 (Section 1) – Kustigi to Gajendragh
2. HS2 (Section 2) – Gajendragarh to Ron
3. HS3 (Section 3) – Ron to Belavanki
4. HS4 (Section 4) – Belvanki to Navalgund

Weights and traffic at different locations were estimated as follows:

Table 3: Traffic Weights by Road Sections

	HS1	**HS2**	**HS3**	**HS4**
Average Daily Traffic at Base Year	25.9	27	18	26
Two Wheelers	493	807	424	161
Car/Jeep/Van	265	331	254	149
Three Wheelers	78	277	113	11
Mini Bus	29	76	94	46
Bus	160	134	134	68
Light Goods Vehicle	38	79	45	30
Two Axle	198	122	151	124
Three Axle	46	50	19	17
Multi-Axle	33	18	10	4
Agri-tractor	88	104	33	42
Non-Motorized Vehicle	440	340	384	147
Total Vehicles	1868	2338	1661	700

For the sake of total vehicular loading on the road, the conversion factors for different multimodal transport system in equivalent passenger car units (PCU) were assumed as follows:

Table 4: Passenger Car Unit Breakdown by Transport Type

Average Daily Traffic at Base Year	PCU
Two Wheelers	0.5
Car/Jeep/Van	1.0
Three Wheelers	0.5
Mini Bus	1.5
Bus	3.0
Light Goods Vehicle	1.5
Two Axle	3.0
Three Axle	4.5
Multi-Axle	4.5
Agri-tractor	8.0
Non-Motorized Vehicle	1.1

Toll Structure

The road is to be operated as a tolled road. The toll charged from each type of transport vehicle is indicated below. The toll charges will be adjusted for inflation every year for the sake of analysis.

Table 5: Toll Structure by Transport Type

Average Daily Traffic at Base Year	INR
Car/Jeep/Van	10
Three Wheelers	1
Mini Bus	2
Bus	3
Light Goods Vehicle	2
Two Axle	3
Three Axle	4
Multi-Axle	5
Agri-tractor	3
Non-Motorized Vehicle	

Economic Benefits

Economic benefits of road improvement and widening were also estimated. Savings after the project as a result of fuel efficiency was estimated to be 65 percent of fuel cost. For motorized vehicles, there would be further savings in labor as well as maintenance cost, each accounting for 50 percent in the saving of fuel cost. Additionally, there would be savings in the opportunity cost of labor for savings in motor travel time cost/vehicle/day which was estimated to be 50 percent of total savings in fuel cost and operation and maintenance cost of the motorized vehicles.

For non-motorized vehicles, labor charges before the project was estimated to be INR 50 Per vehicle/day and other maintenance charges before the project was considered to be INR 30 vehicles/day. It is anticipated that 65 percent savings in labor charges as well as maintenance charges/day would be affected as a consequence of the project. For the purposes of the project, fuel per litre was taken at INR 48.

Discount Rate

Discount Rate on equity will be considered as 12 percent real.

Economic Life of the Project

Economic life of the project is 25 years.

Project Duration

Project operational life is 15 years.

Domestic Inflation Rate

Domestic inflation rate is taken as 7 percent for the project.

Financial Analysis

The financial analysis was conducted and financial viability of the project was calculated from the equity and total investment points of view. The analysis of the project from the total investment perspective looks at the overall financial feasibility of the project. Unlike the equity point of view, it does not include the loan and loan repayments as cash inflows and outflows, respectively. The pro froma cash flow statement from the total investment point of view is first developed in nominal terms in order to take into account the effects of inflation. The cash flows are then deflated to arrive at their real values. Cash flow profile from the equity point of view is obtained by adding the debt cash flow to the net cash flow from the total investment point of view. The results of the financial analysis show that NPV real as well as nominal for both the equity and total investment points of view was INR 5679 lakhs. Apparently, the project cannot be considered to be financially viable.

Sensitivity Analysis

The sensitivity analysis of the project was conducted for parameters such as toll fee, toll fee factor as well as a two way analysis of traffic growth factor and toll fee and the results are indicated as follows:

Toll Fee

The project is very sensitive to changes in toll fee. If the toll fee is raised from INR 10 per vehicle to INR 30, NPV gets increased from –INR 5679 lakhs to -INR 3880 lakhs. The project will break even at a toll rate of INR 73 per car vehicle.

Toll Fee Factor

The project is also very sensitive to toll fee factor. If the toll fee factor is increased, NPV gets better and the project breaks even at around 18.1 toll factor.

Vehicle Growth Rate and Toll Fee

If the simultaneous vehicular growth rate and toll fee is raised, NPV keeps on improving. At a toll fee of INR 32 per vehicle and growth factor of a little less than three, the project generates positive NPV.

Economic Analysis

For the construction of economic resource flow, the first thing we have to do is to calculate the conversion factors of various line items of financial cash flow.

Calculation of Conversion Factors

The following data is essential for the calculation of conversion factor (CF):
1. Foreign exchange premium;
2. Trade Tax/VAT;
3. Rate of excise duty;
4. Percentage of transportation and handling charges;
5. Foreign exchange component of transportation and handling charges;
6. Elasticity of supply for nontradable goods; and
7. Elasticity of demand for nontradable goods.

Data on various inputs both tradable and nontradables are indicated below to estimate the conversion factors of different items.

Table 6: Non Tradable Items

Items	Subsidy	Tax	Elasticity of Supply	Elasticity of Demand
Bricks	0%	0%	0.6	-0.2
Sand	0%	5%	3	-1
Gravel	0%	5%	2.0	-0.7
Labor	0	0	0.6	-1.2

Table 7: Tradable Items

Items	Price	Transport Charges	Port Handling Charge	Rate of Excise Duty	Sales Tax	FEP
Cement /MT	2897	4%	1%	18%	8%	10%
Steel/MT	20000	4%	1%	18%		
Bitumen and Oil/MT	11816	4%	1.25%	18%	8%	10%
Plant and Machinery/Hour	1000	4%	1.25%	18%	8%	10%

For other miscellaneous items, financial price and economic price both are INR 2 per square meter. The share of different items in the construction and maintenance of road is indicated:

Table 8: Road Construction Input Percentage Shares

Item	Share
Cement	15%
Steel	12%
Sand	15%
Bricks	15%
Gravel	40%
Others	3%

Based on the above data and calculations, the conversion factors of different items are indicated:

Table 9: Road Construction Input Conversion Factors

Item	Share
Cement	0.87
Steel	0.87
Sand	0.96
Bricks	0.96
Gravel	0.96
Others	1.00

The respective conversion factors are multiplied by the line items of financial cash flow for total investment point of view (TIP) in order to get the cash flow from which economic NPV can be estimated. The results of the economic analysis indicate that the economic NPV is +INR 2043 and IRR is 21 percent which appears higher than the hurdle rate. The project is therefore, considered viable from the economic point of view.

Distributive Analysis

In distributive analysis the gains and losses to various stakeholders are derived from the present value of economic resources minus present value of financial resources. The resulting figures show who benefits and who loses from the project. For doing it, we subtract each line item of financial cash flow (TIP) from the respective line item of economic resource flow. Each line thus obtained, is discounted by the economic discount rate to determine who gains or who loses from the project. The results of the distributive analysis show that economic NPV is INR 7723 lakhs higher than financial NPV. The beneficiary from this project will be primarily the consumers to a tune of 6971 lakhs and to some extent suppliers who gain INR 783 lakhs. The government loses INR 31 lakhs.

Benefits	Consumer	Government	Supplier
Economic Benefits	6871		

Benefits	Consumer	Government	Supplier
Toll		0	
Salvage value		-31	
Base Costs			419
Physical Contingencies			52
Supervision Costs			8
Miscellaneous Costs			0
Patching			34
Overlay			36
Edge Repair			198
Crack Ceiling			31
Change in Cash Balance		5	
NPV of Externalities	6971	-31	783

Conclusions

The probability of financial NPV for being positive is 0 percent and the probability of economic NPV and consumer NPV to be (negative) is also 0 percent. Therefore, there is no risk in the project from economic point of view and consumer point of view. Hence, project can be taken up.

Recommendations

As of now, currently, no toll is being collected on the project road in the state. For study purpose, it was assumed that the toll model as assumed in the project will be able to meet the annual maintenance expenditure on roads to some extent. Hence this type of toll model can be taken as a pilot project. If this yields fruitful results, this can be extended to other suitable roads in a phased manner.