CHAPTER 3

3.Project Reports

CHAPTER 3: PROJECT REPORTS

3.1 Introduction

All projects go through various stages between the conceptualisation until the time of completion and commissioning of the project. The important stages are as follows:

(i) Identification of a project - for some projects where existing system is available, pre-feasibility can be carried out as a part of the feasibility report (refer Section no. 3.6)

(ii) Execution of a Pre-feasibility study;

(iii) Preparation of a feasibility report (population projections, source availability, conditional assessment of the infrastructure, land availability for all component sites, concept development, alternatives, technological options, funding, revenue generation, operation and maintenance (O&M) expenditure, asset management etc.)

(iv) Preparation of a Detailed Project Report (DPR) including GIS survey, collection of data, GIS mapping of existing infrastructure, consumer survey including geo coding of consumer meters, raw water quality characteristics. The conditional assessment of existing infrastructure, population projections of city, ward-wise population forecast, supply, demand forecast, demand allocation to nodes of distribution network using GIS based land use patterns, capacity/sizing of various components, viz., WTP, ESR/GSR, network, etc., should be included. Special emphasis should be given to source identification, source sustainability, selection of treatment technology/ method, land availability for all components of the system, electrical feeder availability, environmental social safeguards. The detailed engineering design including layouts, hydraulic flow diagram, single line diagrams, GIS-based network modelling incorporating zoning and District Metering Areas (DMAs), rehabilitation plan of existing infrastructure, system improvement plan, estimation and costing, O&M plan, financial analysis, and revenue generation, etc.

(v) Technical appraisal and financial and administrative sanctions or approvals, including various permissions needed from concern departments, viz., water resources, highways, railways, forest, etc.

(vi) Execution/Implementation of the project (bidding, contract award and project management)

(vii) O&M

3.2 Project Reports

Project reports deal with all the aspects of pre-feasibility planning and establishes the need as well as the feasibility of projects technically, financially, socially, culturally, environmentally, legally, and institutionally. A project report should be prepared in four stages, viz., (i) identification stage; (ii) pre-feasibility stage; (iii) feasibility stage; and (iv) DPR stage. Detailed engineering and preparation of technical specifications and tender documents are not necessary for taking investment decisions since these activities can be carried out once source and financial sustainability are ensured. At the end of each stage, decision on broad technical and financial feasibility should be taken into consideration while deciding whether to proceed to the next planning stage and commit the necessary manpower and financial resources for the next stage. The basic design of a project is influenced by the authorities/organisations who are involved in approving, implementing, and operating and

maintaining the project. Therefore, the institutional arrangements through which a project will be brought into operation must be decided at the project preparation stage itself. Sometimes more than one organisation may have a role to play in the various stages of preparation of a project, it is therefore, necessary to identify a single entity to be responsible for overall management and co-ordination of each stage of project preparation. The implementing authority and authority responsible for O&M of a project should be consulted at the project preparation stage itself.

3.3 Project Identification Report

The identification of the project is based on the existing infrastructure and need of additional infrastructure to attain Service Level Benchmarks (SLBs, as published by MoHUA). The project identification report provides an overview of the existing water supply systems, the need for the project, and a brief description of the indicated project and its alternatives and order-of-magnitude costs. At this stage, the planner explains the project and its priority within the context of ULB, state, regional and national development plans for the sector.

The project identification report can be prepared in a reasonably shorter time if the planner is familiar with the local, sectoral, and regional development plan, and sector programme is available. Where there is considerable information already available and some analysis has already been carried out, such a knowledgeable planner should be able to produce the report based on a "desktop study". It is essential, however, that the project area and the site is inspected to ensure that existing background information is realistic including confirmed sustainable source, land availability and that future developments are unlikely to provide any surprises/challenges to project planners. If there is little existing data and analysis, some block estimates of necessary facilities and land acquisition/resettlement cost (if any) will have to be made. If new technologies are being considered for treatment. ULBs can first go for pilot studies. The following checklist shows the kind of information which should be included in a Project Identification Report:

(i) Identification of the project area and its physical environment;

(ii) Provision of a GIS map showing the project area, project components, and a definition of intended beneficiaries. The following plans may be enclosed with the report:

   a. an index plan to a required scale of 1 cm = 2 km or so, showing the project area, existing works, proposed works, location of community/township or institutions to be served;

   b. a schematic diagram showing the salient levels of project components;

(iii) Analysis of the existing population, its physical distribution and socio-economic factors;

(iv) Identification of the present water supply arrangements and status of SLBs in the project area including the baseline performance indicators, gap between the benchmark and the actual performance indicator, population projections including ward-wise population projection, for planning period according to existing and future land use plans or master plans;

(v) Evaluation of water availability and requirements during project horizon for domestic, industrial, commercial, institutional and any other uses;

(vi) Establishment of the need of the project in respect of local, regional, national context. State the objective of short-term and long-term plans in terms of population to be served, SLB to be achieved and the impact of the project after implementation;

(vii) Alignment of sectoral strategies with ongoing related activities;

(viii) Identification of any adverse impacts on the environment and positive impact on the livelihood of the proposed beneficiaries of project area;

(ix) Examination of the master plan for present and future requirement of infrastructure for various project components, with alternatives for physical facilities and supporting activities (O&M, capacity building, etc.);

(x) Presentation of preliminary cost estimates (component-wise) for pre-construction activities (e.g., project preparation cost, land acquisition/resettlement cost, etc.), construction of physical facilities, supporting activities and cost of O&M, consumer services, etc. Also, identify the source of funding for financing capital works and work out plan for probable financial burden on the ULB as per annual revenue and expenditure calculated;

(xi) Indication of institutions responsible for project preparation, project approval, financing, implementation, O&M, viz., ULB, State Government, and National Government;

(xii) Outline water-related policy issues that need to be addressed prior to the project approval;

(xiii) Indication of challenges with respect to technical capacity of the implementing agency required for next stage that may become an obstacle;

(xiv) Specification of the preliminary terms of reference for the pre-feasibility and feasibility stages of the project preparation.

3.4 Survey and Investigations

Once the project is approved in-principle based on the Project Identification Report, the survey and investigation must be carried out in full details, to plan and design the components of the proposed water supply system.

The details of all the survey and investigation are referred in Section 2.7 of Part A of this manual and covering the following:

- Basic information
- Physical aspects
- Survey of natural conditions
- Sanitary survey of sources
- Asset surveys and condition assessment of existing facilities
- Detailed project survey including population, water demand, land availability, asset availability from existing water supply scheme for new project, pipeline network, identification of source and its sustainability for future demand
- Digital terrain modelling
- GIS mapping
- Geotechnical investigations

3.5 Environmental and Social Safeguards studies

The development of water supply projects and programmes has a wide range of environmental and social impacts, both beneficial and adverse. The safeguard measures are designed to first identify and then try to avoid, mitigate, and minimise adverse environmental and social impacts that may arise in the implementation of development projects. The studies have to be carried out to avoid delays in the execution and implementation of the project.

3.5.1 Environmental Safeguards

Environmental safeguards aim to ensure the environmental soundness and sustainability of projects, and to support the integration of environmental considerations into the project decision-making process. The project impact and their significance have to be identified, alternatives have to be examined, and environmental impact management plans have to be prepared, implemented, and monitored. The people likely to be affected by the project are also consulted. The costs involved in environmental safeguards can be arrived at and included in the project cost.

3.5.2 Social Safeguards

Major development projects frequently have adverse implications that harm vulnerable communities. Projects that are likely to evict families from their homes, deteriorate Indigenous peoples' living conditions, or aggravate social problems on a local level.

Social safeguards help development programmes avoid negative consequences, manage social risks, and encourage social inclusion.

Social safeguards are meant to prevent these and other unforeseen consequences, and to devise appropriate strategies to minimise them when they cannot be avoided. They also enable projects develop their full potential, manage social risks, and promote social inclusion. The costs involved in social safeguards can be arrived at and included in the project cost.

3.6 Pre-Feasibility Report

After technical and administrative clearance is accorded to the project identification report by the concerned authority and/or owner of the project, and commitments are made to finance further studies, the work of preparation of pre-feasibility report should be undertaken by an appropriate agency. The agency may be State/UT Urban Development Department or Water Supply Department/Board/Urban Local Body, or other similar agencies. Professional consultants working in the water supply sectors may also be engaged by the Agency. The terms of reference and the scope of the project preparation should be carefully set out.

Since feasibility studies are time extensive and expensive, the essence of the pre-feasibility stage is the screening and ranking of all project alternatives to select the preferred project before the detailed feasibility evaluation continues. This logic should be followed whether the pre-feasibility report is a separate activity, is an interim report towards a full feasibility study, or is included with the findings of the feasibility stage in a single report. The pre-feasibility study may be a separate and discrete stage of project preparation, or it may be the first stage in a comprehensive feasibility study. A pre-feasibility report can be taken to be a Preliminary Project Report, the structure and component of which are as follows:

(i) Executive summary

(ii) Introduction

(iii) The project area, its selection, and the need for a project

(iv) Proposed “Drink from Tap” with 24×7 water supply systems project

(v) Financial, environmental, and social analysis

(vi) Conclusions and recommendations

(vii) Tables, figures/maps, and annexures

3.6.1 Executive Summary

It is a good practice to provide an executive summary at the beginning of the report. The executive summary provides a brief overview of the project and contains its main points, salient features, basic strategy, and approach adopted in developing the study project. It is the summarised version of a complete project.

The objective of achieving “Drink from Tap” with 24×7 pressurised water supply system has to be clearly mentioned with ULB’s intentions and proposed actions planned to be taken.

3.6.2 Introduction

This section briefly explains the origin and concept of the project, how it was prepared and the scope and status of the report. The sub-sections may be detailed as under:

a) Project Genesis:

(i) Describe how the proposed project idea was developed and its alignment with current related policies of development.
(ii) Indicate the agency responsible for promoting the project and their roles.
(iii) List and explain previous studies and reports on the project (particularly the project identification report) prepared by different agencies.
(iv) Refer to related long-term plans for the sector, regional development, land use, water resources sustainability, environmental and social safeguards, public health, etc.
(v) Explain the Methodology adopted for carrying out the study.
(vi) Outline the study's timelines.

b) Scope and intended use of the Report:

(i) Explain how this pre-feasibility report fits in the overall process of project preparation.
(ii) Identify data limitations.
(iii) List interim reports or notes submitted during the pre-feasibility study and summarise any guidance provided by the responsible project authority.
(iv) Explain whether the pre-feasibility report is intended to be used to obtain in-principle approval for the proposed project. If so, the report needs to be more comprehensive and less tentative in its conclusions than in cases where a feasibility study is already underway or expected to be initiated shortly after the pre-feasibility report is completed.

3.6.3 The Project Area and the Need for the Project

This section explains why the project is needed and talks about the following:

(i) the project area and population served;

(ii) the present water supply services in the project area;

(iii) the prospects for future development;

(iv) the need to improve existing services.

3.6.3.1 Project area

- Give a geographical description of the project area with map/maps, describe special features such as topography, climate, culture, religion, migration, etc., which may affect project design, implementation, O&M.

- Provide a GIS Map showing administrative and political jurisdiction;
- Include details of notification of additional towns/villages as urban area, if any;
- Describe, if any, ethnic, cultural, or religious aspects of the communities that may have a bearing on the project proposal.
- Show coverage areas where the pipe network is expected and mark the areas where a pipeline is not expected to be laid (for example cantonment area, industrial area, etc.).

3.6.3.2 Population pattern

- Estimate population in the project area, indicating the source of data or the basis for the estimate.
- Review previous population data of the project area, historic growth rates and its causes.
- Estimate future population growth with different population forecasting methods and indicate the most probable growth rates and compare with past population growth trends.
- Adopt computation of ward-wise future population density based on equivalent area (GIS based application) made for projection of city population. Population projected using various methods should be analysed and considered judiciously.
- Estimate probable densities of population in different parts of the project area at future intervals of time, e.g., five, ten, fifteen, twenty, and thirty years ahead.
- Compare growth trends within the project area, with those for the region, state, and the entire country.
- Discuss other factors likely to affect the population growth rates in the project area such as development marked for the area in the master/regional plans that may increase or decrease the growth rate, e.g., national park, special economic zone (SEZ), industrial parks, industrial corridors, proposed merger of adjoining villages, etc.
- Discuss patterns of seasonal migration, if any, and estimate floating population within the area. Indicate implication of the estimated growth pattern on housing and other local infrastructure.

3.6.3.3 Economic and social conditions

- Describe present living conditions of the people of different socio-economic and ethnic groups and their likely uplift in the future.
- Identify locations according to income levels or other indications of socio-economic studies.
- Show on the project area map ward-wise density of population and the present and future land uses (as per the development plan).
- Provide information on housing conditions and relative proportions of owners and tenants.
- Provide data on education, literacy, and unemployment by age and gender.
- Provide data and project housing standards, and average household occupancy in various parts of the project area.
- Describe public health status within the project area, with particular attention to diseases related to water and sanitary conditions; provide data on maternal and infant-mortality rates, and life expectancy.
- Provide status of health care programmes in the area, as well as other projects, which have bearing on improvements in environmental sanitation.

3.6.3.4 Institutions involved

- Identify the institutions (government, semi-government, non-government, etc.) involved in any of the stages of water supply systems project development in the area (planning, preparing projects, financing, implementation, O&M, and evaluation).

- Comment on roles, responsibilities, and limitations (territorial or others) of all the identified institutions, in relation to water supply systems (this may also be indicated on a diagram).
- Outline various institutions involved in granting permissions for implementation of the water supply projects for, e.g., Water Resources Department/Ground Water Development Authority for water source availability, forest department for pipeline alignment through forest area, national/state highways departments for alignments along or across highways, railway crossings, etc. The process and costs involved for availing the permission/s has to be clearly mentioned.

3.6.3.5 Available water resources

- Summarise the quantity and quality of surface and ground water resources, actual and potential, in the project area and vicinity (give information of sources).
- Indicate studies carried out or being carried out concerning development of potential sources, and their findings.
- Describe the existing patterns of water use by all sectors (irrigation, industrial energy, domestic, etc.), and comment on supply surplus or deficiency and possible conflicts over the use of water, at present and in future.
- Discuss any pollution problems, if any, which might affect available surface and ground water resources.
- Assess sustainability of water resources and propose suggestive measures to ensure sustainability.
- Mention the role of agencies/authorities responsible for managing water resources, allocation, and quality control.

3.6.3.6 Existing water supply systems and population served

Describe all existing water supply systems in the project area, indicating the details as under:

- source of water, quantity and quality available in various seasons, components of the system such as head works, transmission mains, pumping stations, treatment works, balancing/service reservoirs, distribution system, reliability of supply in all seasons;
- areas supplied, hours of supply, water pressures, operating problems, bulk meters, metered supplies, un-metered supplies, bulk supply connections, AMR connections, supply for commercial use, industrial use, and domestic use;
- additional sources for water supply such as, wells, tube wells, bores, water vendors, other authorities, e.g., state industrial development corporations, etc.;
- information of number of Operational Zones (OZs) and DMAs in each OZ;
- number of people served according to water supply systems of the following category:
  - unprotected sources like shallow wells, rivers, lakes, ponds, etc.;
  - protected other sources like wells, tube wells, bores, rainwater storage tanks etc.;
  - areas not served by distribution network.
- number of household tap connections, number of stand-posts and percentage of population served with household tap connection and stand-post, if any;
- consumers' opinion about stand-post water supply, (e.g., distance, hours of supply, waiting time etc.) and their aspiration for household tap connection;

- number of people obtain water from more than one source, note these sources, and their water used, e.g., drinking, bathing, washing, etc., and reasons for their preferences;
- explain non-revenue water (NRW), probable causes and trends and efforts made to reduce NRW;
- engineering and social problems of existing systems and possible measures to resolve these problems and the expected improvement of the systems.

3.6.3.7 Existing sanitation systems and population served

Even if the proposed project may be for providing a single service, i.e., water supply and not sanitation, the existing sanitation arrangements should be described, giving details of the existing sanitation and waste disposal systems in the project area, and the number of people served by each system. Impact of the existing system on drinking water quality and environment should be assessed and details provided for past contamination events.

Briefly describe existing systems of storm water drainage and solid waste collection, treatment, and disposal. This discussion should be focused in terms of their impact on water supply systems and environment.

3.6.3.8 Need for the project

The following may be included:

- Describe why the existing system cannot satisfy the existing and projected demands at the desired SLBs to the population, commercial, institutional, and industrial demand with adequate quantity and quality on long term basis.
- Describe the consequences of not taking up a project for rehabilitation/ augmentation of the existing system and/or developing a new system.
- Indicate priorities for improvement of existing system, expansion of system, construction of new system, supply for domestic, industrial, and commercial and institutional use.
- Assess the need for consumer education in hygiene.
- Comment on the urgency of project preparation and implementation.

3.6.4 Long Term Plan for Water Supply

(i) **Water supply services improvement**

Improvement in water supply services has to be planned as a phased development programme keeping in view of consistency with the future overall development plans associated with term project or strategic plan. The implementation should be made as an integrated programme for all components of the water supply systems. A long-term plan may be prepared for a period of 30 years, and alternative development sequences may be identified to provide target service coverage and standards at affordable costs. From these alternative development sequences, a priority project to be implemented in near-term can be selected. It is this priority project, which then becomes the subject of a comprehensive feasibility study.

(ii) **Service Coverage**

The planning of new water supply schemes shall be made for “Drink from Tap” 24x7 pressurised water supply system basis to achieve the SLBs for water supply systems, released by the Ministry of Housing and Urban Affairs, Govt. of India, from time to time. Redevelopment or retrofitting of existing water supply infrastructure should also be adopted to achieve the SLBs.

Alternative development sequences should be identified in the light of the service coverages to be achieved during the planning period in phases. This calls for definition of the following:

- population to be covered with improved water supply facility with adequate quantity and of prescribed quality on long term basis;
- other consumers of water to be covered (industrial, commercial, government, institutions, etc.);
- service standards to be provided for various section of population, e.g., functional household tap connections (FHTC), yard-taps, bulk connections, public kiosk, utility services and temporary point sources, etc.;
- target dates by which the above-mentioned service coverage would be extended within the planning period, in suitable phases.

(iii) **Project affordability**

It must be noted that service standards can be upgraded over a period of time. Therefore, various options can be considered for different areas. While selecting a service standard, community preferences and affordability should be ascertained through a dialogue with the intended beneficiaries. Only those projects, which are affordable to the people they serve must be selected. This calls for careful analysis of the existing tariff policies and practices, cost to the users for various service standards, willingness to pay and income of various groups of people in the project area.

(iv) **Water requirement**

Achieve the service coverage in stages over a planned period, requirements of water can be worked out for each year (or in suitable stages), by adopting different standards at different stages. The demand for industrial, commercial, and institutional users may also be added. Thus, water for the projected needs throughout the planned period can be quantified, (duly considering realistic allowances for unaccounted for water and the daily and seasonal variations) for alternative service standards, and service coverage. These demands form the basis for planning and providing system requirements.

The annual water requirements should also take into consideration water demands for upgrading sanitation facilities if proposals to that effect are under consideration. Consistency and co-ordination have to be maintained between projections for both water supply and sanitation services.

(v) **Anticipation of funds**

It must be noted that availability of funds, through various missions of the central government, states/UTs government/loan or grant from bilateral and multilateral agencies, private investment, public-private partnership, or any other sources, is one of the prime factors that will ultimately decide the scope and scale of a feasible project.

(vi) **Selection of a strategic plan:**

Each of the alternative development sequences, which can overcome the existing deficiencies and meet the present and future needs, consists of a series of improvements and expansions to be implemented over the planned period. Since all needs cannot be satisfied in the immediate future, it is necessary to carefully determine priorities of target groups for improvement in services and stages of development and thus restrict the number of alternatives.

(vii) **Planning for system requirement**

The following needs to be considered as part of planning:

- Possibilities of rehabilitating and/or de-bottlenecking the existing systems
- Reduction in water losses which can be justified economically, by deferring development of new sources
- Alternative water sources, surface and ground water with particular emphasis on maximising the use of all existing water sources
- Alternative transmission and treatment systems and pumping schemes
- Distribution system including pumping station, balancing/service reservoirs and adoption to "Drink from Tap" with 24×7 pressurised water supply systems, with DMA approach. The details can be referred from Section 2.8 of Part A manual.
- Providing alternative service standards in future, including upgrading of existing facilities and system expansion

(viii) **Need Assessment for Supporting Activities**

It may also be necessary to ascertain if supporting activities like Information, Education and Communication (IEC), health education, staff training and institutional improvements, etc., are necessary to be included as essential components of the project. All the physical and supporting inputs need to be carefully costed (capital and operating), after preparing preliminary designs of all facilities identified for each of the alternative development sequences. These alternatives may then be evaluated for the least cost solution by net present value method, which involves:

- expressing all costs (capital and operating) for each year in economic term;
- discounting future costs to present value;
- selecting the sequence with the lowest present value by net present value method.

(ix) **Costings and their expressions**

As stated above, costs are to be expressed in economic terms and not in terms of their financial costs. This is because the various alternatives should reflect resource cost to the economy as a whole at different future dates. Costing of the selected project, however, may be done in terms of financial costs, duly considering inflation during project implementation.

3.6.5 Proposed Water Supply Project

(i) Details of the Project

The project to be selected are those components of the least cost alternative by net present value method of development sequence, which can be implemented during the next two to four years. Components of the selected project may be as follows:

- Rehabilitation, retro-fitting and de-bottlenecking of the existing facilities for providing "Drink from Tap" with continuous (24×7) water supply systems
- Construction of new facilities for improvement and expansion of existing systems
- Support activities like information, IEC, consumer education, public motivation, etc.
- Equipment and other measures necessary for O&M of the existing and expanded systems

- Consultancy services needed (if any) for conducting feasibility study, detailed engineering, construction supervision, socio-economic studies, environment and social safeguards studies, studies for reducing water losses (NRW reduction), tariff studies, willingness to pay, acceptance of metering, studies for improving accounts support activities

(ii) Support documents

All project components should be thoroughly described, duly supported by documents such as:

- GIS-based project area map with clear demarcation of ward boundary;
- technical information for each physical component (infrastructure), socio-economic study, statutory clearances and economic analysis, where necessary;
- preliminary engineering designs (hydraulic design) and drawings in respect of each physical component, such as head works, transmission mains, pumping stations, treatment plants, balancing reservoirs, distribution lines, etc.

(iii) Implementation schedule

A realistic implementation schedule should be presented, taking into consideration the time required for all further steps to be taken, such as conducting feasibility study, appraisal of the project, sanction of the project, fund mobilisation, various permissions needed, implementation, trial runs, and commissioning. In preparing this schedule, due consideration should be given to all authorities/groups whose inputs and decisions can affect the project and its timing, bottlenecks expected during execution of the project, time required for getting statutory approvals, No Objections Certificates (NOCs), and other necessary components.

(iv) Cost estimates

Cost estimates of each component of the project should be prepared and annual requirement of funds for each year should be worked out, taking into consideration the likely annual progress of each component. Due allowance should be made for physical contingencies and annual inflation. This exercise will result in arriving at total funds required annually for implementation of the project.

(v) Environment and social impact

The pre-feasibility report should bring out any major environment and social impact the project is likely to cause and if these aspects will affect its feasibility.

(vi) Institutional responsibilities

The pre-feasibility report should identify the various organisations/departments/ agencies that would be responsible for further project planning, preparation, approval, sanction, funding, implementation and O&M of the project. This should also indicate the strength of personnel needed to implement and later operate and maintain the project. It should also discuss special problems likely to be encountered during O&M, in respect of availability of skilled and technical staff, training and professional development required, funds, transport, consumables, communication, power, spare parts, etc. Quantitative estimates of all these resources should be made and included in the project report.

(vii) Financial aspects

The capital cost of a project is a sum of all expenditure required to be incurred to complete design and detailed engineering of the project, construction of all its components, including support activities and conducting special studies. After estimating component-wise costs, they may also

be worked out on annual basis, throughout the implementation period, taking into consideration construction schedule and allowances for physical contingencies and inflation. Basic item costs to be adopted should be of the current year. Total of such escalated annual costs determines the final cost estimate of the project. Financing plan for the project should then be prepared, identifying all the sources from which funds can be obtained, until the project is completed. The possible sources of funds include:

- cash reserves available with the project authority;
- cash generated by the project authority from sale of water from the existing facilities;
- grant-in-aid from the Government;
- loans from the Government;
- loans from Indian financing institutions, banks, etc.;
- loans and grants-in-aid from bilateral and multilateral funding agencies like AFD, World Bank, JICA, ADB, etc.;
- open-market borrowings, e.g., bonds;
- public-private partnership (PPP);
- capital contributions from company social responsibility (CSR), voluntary organisations, etc.

If the lending authority agrees, interest payable during implementation period can be capitalised and loan amount increased accordingly.

The next step is to prepare recurring annual costs (annual operating budget) of the project for the next few years (say five years) covering the operating and maintenance expenditure of the entire system (existing and proposed). This would include expenditure on staff, chemicals/consumables, energy, spare parts and other materials for system operation, transportation, up-keep of the systems and administration.

The annual financial burden imposed by a project comprises the annual recurring cost and payment towards loan and interest (debt servicing). This has to be met from the operational revenue, which can be realised from sale of water. The present and future tariff of water should be identified and a statement showing annual revenue for five-year period, beginning with the year when the project will be operational, should be prepared. If this statement indicates that the project authority can generate enough revenue to meet all the operational expenditure as well as repayment of loan and interest, the lending institution can be persuaded to sanction loans for the project.

Every State Government and the Government of India has programmes/missions for financing water supply schemes in the urban and rural areas, and definite allocations are normally made for the national plan periods. It will be necessary at this stage to ascertain if and how much finance can be made available for the project under consideration, and to estimate annual availability of funds for the project till its completion. This exercise has to be done in consultation with the concerned department of the Government and the lending institutions, who would see whether the project fits in the sector policies and strategies, and can be brought in an annual planning and budgetary cycle taking into consideration the commitments already made in the sector and the overall financial resources position. The project may be finally sanctioned for implementation if the financing plan is firmed up.

3.6.6 Conclusions and Recommendations

(i) Conclusions

This section should present the essential findings and results of the pre-feasibility report. It should include a summary of:

- Review of the need for the project

- Existing service coverage and SLBs
- Long-term development plans considered
- The recommended project, its scope in terms of service coverage and SLBs
- Priorities concerning target-groups and areas to be served by the project
- Capital costs and tentative financing plan
- Annual recurring costs and debt servicing
- Tariffs and projection of operating revenue
- Limitation of the data/information used, and assumptions and judgments made; need for in-depth investigation, survey, and revalidation of assumption and judgments, while carrying out feasibility study

Administrative difficulties likely to be met with and risks involved during implementation of the project should also be commented upon. These may pertain to boundary question for the project area, availability of water, sharing of water sources with other users, availability of land for constructing project facilities, permissions from various agencies, co-ordination with the various agencies, acceptance of service standards by the beneficiaries, acceptance of recommended future tariff, shortage of construction materials, implementation of support activities involving peoples' participation, supply of power, timely availability of funds for implementation of the project and problems of O&M of facilities.

(ii) Recommendations

a. This should include all actions required to be taken to complete project preparation and implementation, identifying the agencies responsible for taking these actions. A detailed timetable for actions to be taken should be presented if found necessary and feasible, taking up of works for rehabilitating and/or de-bottlenecking the existing system should be recommended as an immediate action. Such works may be identified and costed so that detailed proposals can be developed for implementation.

b. The proposal of project authority for taking up detailed investigations, data collection and operational studies, pending undertaking, and feasibility study may also be indicated.

c. The feasibility study can then be taken up at the beginning of the implementation phase and results of the study, if noticed to be at variance with the earlier ones, suitable modification may be introduced during implementation.

d. With respect to projects, a comprehensive feasibility study may have to be taken up before an investment decision can be taken.

3.7 Feasibility Report

The feasibility report may have the following sections:

(i) Background

(ii) The proposed project

(iii) Institutional and financial aspects

(iv) Conclusion and recommendations

3.7.1 Background

This section should describe the history of project preparation, the relation of this project to studies carried out earlier and, in particular, set in the context of a pre-feasibility report. It should also bring out if the data/information and assumption made in the pre-feasibility report are valid, and if not, changes in this respect should be highlighted. References to all previous reports and studies should be made.

With respect to the project area, the need for a project and strategic plan for water supply, only a summary of the information covered in the pre-feasibility report should be presented, highlighting such additional data/information collected, if any, for this report. The summary information should include the planning period, project objectives, service coverage, SLBs considered and selected for long-term planning and the project, community preferences, and affordability, quantification of future demands for services, alternative strategic plans, their screening and ranking, recommended strategic plan, and cost of its implementation.

3.7.2 The Proposed Project

This section describes details of the project recommended for implementation. The information presented here is based on extensive analysis and preliminary engineering designs of all components of the project. The detailing of this section may be done in the following sub-sections:

(i) Objectives

Project objectives may be described in terms to achieve the objectives such as “Drink from Tap” with 24×7 pressurised water supply system, SLBs, functional household tap connection, health status improvements, ease in getting water by consumers, improved living standards, capacity building, institutional improvements, etc.

(ii) Project users

Define number of people by location and institutions/industrial units who will benefit from the project area and reasons for the same, and explain user’s involvement/participation during preparation, implementation, and O&M of the project.

(iii) Rehabilitation and de-bottlenecking of the existing water supply systems

All rehabilitation, improvements, and de-bottlenecking works, if necessary, should be planned for before execution of the proposed project. If so, these activities should be mentioned in the feasibility report. If, however, these works are proposed as components of the proposed project, the necessity of undertaking the rehabilitation/improvement/de-bottlenecking works should be explained.

(iv) Project description

This may cover the following items:

- Definition of the project in the context of the recommended development alternative (strategic plan) and explanation for the priority of the project;
- Details of existing infrastructure which shall be put in service;
- Brief description of each component of the project, with maps and drawings;
- Brief description of measures to be taken to achieve “Drink from Tap” with 24×7 water supply, SLBs, including the functions, location, design criteria, and capacity of each component;
- Technical specification (dimension, material) and performance specifications;
- Stage of preparation of designs and drawings of each component;

- Method of financing and constructing in-house facilities, like plumbing and service connection, etc.

(v) Support activities

Need for description of components such as IEC, capacity building, and other stakeholders training; water quality testing and surveillance; improving billing and accounting; public awareness, consumer services, health education; community involvement/participation, etc.; and timing of undertaking these components and the agencies involved.

(vi) Integration of the proposed project with the existing and future systems

Describe how the various components of the proposed project would be integrated with the existing and future works to achieve the objects and purpose of the project.

(vii) Agencies involved in project implementation and relevant aspects

- Designate the lead agency (Implementing Agency).
- Identify other support agencies including government agencies who would be involved in project preparation and implementation, describing their roles, such as granting administrative approval, technical sanction, permissions, approval to annual budget provision, sanction of loans/grants and other funding agencies, and convergence of funds, construction of facilities, procurement of materials and equipment, etc.
- Outline of arrangements to co-ordinate the working of all concerned agencies with special attention needs to be on co-ordination with the road, railway, electricity, telecommunication, forest, and municipal authorities to get necessary permissions on time to avoid delay in implementation.
- Designate the operating agency and its role during the implementation stage;
- Define the role of Project Management Consultants (PMCs), if necessary, including the scope of their work and terms of reference.
- Describe regulations and procedures for procuring key materials and equipment, power, and transport problems, if any.
- Estimate the number and type of workers and their availability.
- Specify procedures for fixing agencies for works and supplies and the normal time it takes to award contracts.
- List any imported materials, if required, and outline a procedure to be followed for importing them, including an estimation of the delivery period, if any.
- Outline any legislative and administrative approvals required to implement the project, such as those pertaining to riparian rights, allocation of water reservation and point of allocation, water quality criteria, acquisition of lands, permission to construct across or along roads and railways, high-tension power lines, in forest area and defence or other such restricted areas.
- Offer comments on the capabilities of contractors and quality of material and equipment available indigenously.

(viii) Cost Estimates

- Outline basic assumptions made for unit prices, physical contingencies, price contingencies, and escalation.
- Create a summary of the estimated cost of each component for each year till its completion and work out total annual costs, to know annual cash flow requirements.
- Estimate foreign exchange cost if required to be incurred.

- Work out per capita and per connection cost for the construction phase of the project based on design population, and compare these with norms, if any, laid down by the government or with those for similar projects.
- Work out cost per unit of water produced and distributed and compare these with norms, if any, laid down by the government or with those for similar projects.

(ix) Implementation schedule

Prepare a detailed and realistic implementation schedule for all project components, taking into consideration the stage of preparation of detailed design and drawings, statuary clearances from various departments, additional field investigations required, if any, the time required for preparing tender documents, notice period, processing of tenders, award of works/supply contract, actual construction period, the period required for procurement of material and equipment, testing, trials of individual component and commissioning of the facilities, etc.

If consultants' services are required, the period required for completion of their work should also be estimated.

A detailed CPM/PERT diagram showing the implementation schedule for the whole project, as well as those for each component should be prepared, showing linkages and inter-dependence of various activities. Application of latest project management software systems should be encouraged for efficient project management.

The implementation schedule should also be prepared for support activities such as training, consumers' education, etc., and their linkages with the completion of physical components and commissioning of the project should be established.

(x) Operation and Maintenance of the project

Estimate annual operating costs, considering staff, chemicals, energy, transport, routine maintenance of civil works, maintenance of electrical/mechanical equipment, consumer service, cost towards occupational health and safety including normal cost of replacement of parts, spares, and supervision charges. Annual cost estimates should be prepared for a period of five years from the probable year of commissioning the project, taking into consideration expected output levels and escalation.

Proposal for monitoring and evaluating the project performance with reference to project objectives should be indicated.

(xi) Environmental and social impact

Brief description of the adverse and beneficial impacts of the project may be given covering the following aspects:

Beneficial Impact	Adverse Impact
Ease and convenience in obtaining safe and sufficient water at household levels. Increase in productivity of people in the time saved and internal social alleviation.	Risk of exploiting natural resources by withdrawing surface/ground water. Risk of affecting flora and fauna of surface water stream.
Improvement in public reuse of water in household premises or by water authority.	Effect of disposal of backwash water and sludge from water treatment plant.

Beneficial Impact	Adverse Impact
Effect of construction of storage reservoirs on flood moderation, navigation, ground water table, power generation, etc.	Effects of construction of storage reservoirs on ground water table, down stream flow of the stream, the reservoir bed, etc., and effects on ecology.

3.7.3 Institutional and Financial Aspects

In the long term, project benefits depend at least as much on the organisation responsible for operating and maintaining the project as they do on the organisation which constructs it. Sometimes the same organisations are involved in both stages. Whenever separate entities are involved in construction and O&M, detailed arrangements for a smooth transition from the construction stage to the operational stage should be explained and a clear implementation plan should be in place.

Financial planning and cash flow will affect the execution, operation, and maintenance of the project. A detailed financial analysis has to be carried out to include funding, revenue, and expenditure for the successful implementation of the project.

(i) Institutional aspects

It is necessary to examine the capabilities of the organisations that would be entrusted with the responsibility of implementing the project and of operating the same after it is commissioned. The designated organisation(s) must fulfil the requirements in respect of organisational structure, personnel, financial, health and management procedures, so that effective and efficient performance is expected. This can be done by describing the following aspects:

- History of the organisation, its functions, duties and powers, legal basis, organisational chart (present and proposed), relationship between different functional groups of the organisation, and with its regional offices, its relationship with government agencies and other organisations involved in sector development.
- Public relations in general and consumer relations in particular, extension services available to sell new services, facilities for conducting consumer education programmes, stakeholder consultations, Project Affected Persons (PAPs) consultation, and settling complaints.
- System for identification of losses in system and making it good again by rectifying the deficiencies (NRW reduction and control, power factor rectification, etc.)
- Systems for capital budgeting and recurring expenditure and revenue, accounting of expenditure and revenue, internal and external audit arrangements, inventory management.
- Present positions and actual staff, comments on number and quality of staff in each category, ratio of staff proposed for maintenance and operation of the project to the number of people served, salary ranges of the staff and their comparison with those of other public sector employees or private sector employees.
- Staff requirement (category-wise) for operating the project immediately after commissioning, future requirements, policies regarding staff training, facilities available for training.
- Actual tariffs for the last five years, present tariff, tariff proposed after the project is commissioned, its structures, internal and external subsidies, the procedure required to be followed/to adopt, new tariff, expected tariff and revenues in future years, proposal to meet shortage in revenue accruals.

- Prepare annual financial statements (income statements. balance sheets and cash flows) for the project operating agency, for five years after the project is commissioned, explain all basic assumptions for the financial forecast and the terms and conditions of tapping financial sources, demonstrate ability to cover all operating and maintenance expenditure and loan repayment, workout rate of return on net fixed assets and the internal financial rate of return of the project.

(ii) Financing Plan

Identify all sources of funds for implementation of the project, indicating year-by-year requirements from these sources, to meet expenditure as planned for committing the project as per schedule; state how interest during construction will be paid, or whether it will be capitalised and provided for in the loan; explain the procedures involved in obtaining funds from the various sources.

3.7.4 Record Keeping

Record keeping has to be an integral part of any water supply utility and must maintain all the records (including historical records) of the drawings, investigation reports, project reports, analysis carried out, as-built drawings, O&M records, records of hazards, events, etc. With the advent of digital technology, all the records must be stored in a digital format and made available to the officer in-charge for designing, maintaining, and further planning of water supply system. A dedicated record keeping personnel must be appointed to take ownership of maintaining and up-keeping/ updating of records of water supply systems.

3.7.5 Conclusions and Recommendations

This section should discuss the justification of the project, in terms of its objectives, “Drink from Tap” with 24×7 pressurised water supply system, achieving SLBs, cost-effectiveness, affordability, the willingness of the beneficiaries to pay for services, and the effect of not proceeding with the project. Issues, which are likely to adversely affect project implementation and operation, should be outlined and ways of tackling the same should be suggested. Confirmation of sustainability of water source from the concerned authority such as central/state groundwater authority/central water commission/state water resource authorities may be received. Effect of changes in the assumptions made for developing the project, on the project implementation period, benefits, tariff, costs, demand, etc., should be mentioned.

Definite recommendations should be made regarding time-bound actions to be taken by the various agencies, including advance action which may be taken by the lead agency pending approval and financing of the project.

3.8 Detailed Project Report (DPR)

The DPR stage arrives once the project feasibility is assured and the authorities approve the pre-feasibility/feasibility report. The fundamentals, viz., water availability, sustainability, capacity to execute and implement as well as O&M, are established in the feasibility report, however, need to be reconfirmed and re-assessed in detail.

Thereafter, a detailed survey and investigation to assess the sites and existing infrastructure is carried out based on which specific requirements are identified for achieving the desired SLB and then followed by detailed engineering and design of all the components including environmental and

social impact assessment. GIS-based survey planning and hydraulic design of water supply systems should be carried out to ease in O&M of the systems. Based on these details, cost estimates are prepared which also incorporate costs of land acquisition, actual items in execution of work, safeguards, and mitigation measures. A detailed financial analysis is carried out covering all the aspects of revenue, and expenditure to ensure financial sustainability of the proposed water assets being created and adhering to various government policies being enforced from time to time. These aspects have been discussed and explained in various chapters of this manual.

The DPR has to be prepared as per DPR template (including checklist) made available by CPHEEO from time to time. The sections can be;

(a) Executive summary
(b) Background of project
(c) The existing and proposed project, baseline parameters and the proposed Key Performance Indicators (KPI)
(d) Survey and investigations
(e) Specific requirements of the project
(f) GIS-based detailed design of various components
(g) Environmental and social impact assessment
(h) Detailed cost estimate based on latest schedule of rates which should be updated every year for every state/UT (for each region in the state).
(i) Specifications for various Items
(j) Financial planning
(k) Conclusion and recommendations
(l) Checklist for “Drink from Tap” with 24×7 pressurised water supply system project