CHAPTER 4: FINANCING AND FINANCIAL MANAGEMENT

4.1 INTRODUCTION

The age-old perception has been drinking water given by the local body is a free service. Slowly, this has changed at least in the urban sector and people are becoming aware of their obligation to pay for the service received. However, even now, there is no change in the rural sector. Similarly, the awareness to avoid open-air defecation also has been realized in the urban sector, but not so in the rural sector. It has been ascertained that even in the urban sector, open defecation continues to be practised by about 12.6% of the population. Recognizing the importance of MDG for water and sanitation, it is imperative to eradicate open defecation, but the obstacle is the paucity of required capital and O&M funds for sewerage and sanitation. The difficulty is compounded by the unwillingness of the public to pay their dues, except in some urban areas. Even in the urban sector, the revenues of many local bodies do not meet the actual expenditures of sewerage, leave alone saving towards a corpus fund for development in the future. Thus, it is a challenge to identify the ways and means of achieving the physical objective of total sanitation by a judicious blend of location specific technologies and managing finances diligently by devising newer models of project delivery mechanisms. This chapter presents the possible options.

Subsidies for latrines have long been announced by the Governments both State and Centre. Yet, the conveying of the message to the likely beneficiaries and getting the concept into practice has not been happening as expected. One of the notable schemes is the news item (The HINDU, March 20, 2011) which reports that Dakshina Kannada and Shimoga districts of Karnataka have earned the distinction of being the “cleanest” districts, having won the annual sanitation award of the state as a part of an effort to encourage sustainable sanitation.

A subsidy of Rs. 3,000 is given to below poverty-line families who want to build toilets in their houses, but some districts are yet to come out of the “mindset” that toilets are unnecessary. In Tamil Nadu, the subsidy has been increased to Rs. 4700 (Source The HINDU, March 20, 2011 and June 14, 2012).

4.2 CAPITAL AND REVENUE

The financial needs are mainly the capital, which is meant for creation and upkeep of the infrastructure and O&M on a day to day basis. This is a symbiotic exercise and both aspects are equally important. Usually, the finances for the capital works come from the Government sector, but the funds for O&M have to be met by the population, who should pay taxes and charges for services. Herein lies the basic problem. The funds for capital also indirectly come from the taxes to be paid by the population for other services as well. Thus, as long as the revenues earned by the Government are not compatible with the totality of the provision and upkeep of the various services, the exercise within the Government is prioritization of allocations to the various services from limited funds continues. As long as this cycle goes on, it is simple to understand that the objectives stated above can never be achieved. Thus, it is essential to devise changes in the physical and financial contents of sewerage services in such a way that it is still possible to bridge the gap.

4.3 SOURCES OF FUNDING

4.3.1 Central Assistance (Grant in Aid, Loan)

The GOI disburses funds to the States as grant-in-aid under the Central Programmes based on its own assessment of the financial stability of the States to handle the grants effectively, and the human resources available with the concerned local bodies.

4.3.2 State Funding

State Budget, which is the official annual announcement by the Government on funds for various sectors like, transport, roads, sewage, education, and so on, is a source of funding.

Some projects are subsidized by central governments, namely, the MoUD and the MoEF. Their subsidies vary from 35%–100% depending on the date of approval of projects and population size. The rest of the budget has to be prepared by the states and ULB. Financing of projects would be as given in Table 4.1.

Table 4.1 Example of Financing Pattern

Category of Cities / Town / UAs (Urban Agglomerations)	Grant		ULB or Para-Statal Share / Loan from Financial Institutions
	Centre	State	
Cities / UAs with 4 million plus population as per 2001 census	35%	15%	50%
Cities / UAs with million plus but less than 4 million population as per 2001 census	50%	20%	30%
Cities / towns / UAs in North Eastern States and Jammu & Kashmir	90%	10%	-
Cities / UAs other than those mentioned above	80%	10%	10%
For setting up desalination plants within 20 kms from sea-shore and other urban areas predominantly facing water scarcity due to brackish water and non-availability of surface source.	80%	10%	10%

Source: MoUD, 2005

4.3.3 Institution Funding

These are loans from standing financial institutions such as banks, HUDCO, LIC, NABARD, IL&FS, etc. The outline of funding implemented currently by these institutions is summarized in Table 4.2 overleaf.

Table 4.2 Outline of Funding Implemented currently by Funding Institutions

Institution	Area/Field	Loan Applicant/Joint Venture Partners	Loan Terms & Conditions	Case Studies
National Bank for Agriculture and Rural Development (NABARD) Rural Innovation Fund (RIF)	NABARD is a refinancing agency that has instituted this fund for financial assistance made available in the form of grants and/or loans to support innovative, risk friendly, unconventional experiments in farm, non-Farm (including design of economic and efficient water harvesting structures, innovative rain harvesting for rural dwellings, rural sanitation and waste disposal, and so on) and micro-Finance sectors with the potential to promote livelihood opportunities and employment in rural areas.	Individuals, NGOs, Community Based Organisations, Self-Help Groups (SHGs), Farmer's Club, Panchayati Raj Institutions and corporates with expertise and willingness to implement innovative ideas for improving the quality of life in rural areas.	1) Assistance given is limited to a maximum of 95% of the total project outlay. 2) The Fund will be utilised in a span of 5 years, with an extension period of two years subject to conditions. 3) Support in the form of loan / grant/ incubation fund support, or a mix of all three components. 4) Support decided on a case-by-case basis.	Sanitation Scheme based on the model successfully implemented by Gram Vikas, a renowned NGO in Orissa for a twin structure of toilet and bathing room costing about Rs. 8600/- per unit.

Table 4.2 Outline of Funding Implemented currently by Funding Institutions - continued

Institution	Area/Field	Loan Applicant/Joint Venture Partners	Loan Terms & Conditions	Case Studies
Life Corporation of India (LIC) LIC Infrastructure Bond	Life Insurance Corporation of India (LIC) is the largest insurance group and investment company in India. It is a state-owned in which the Government of India has 100% stake. LIC endeavours to provide security to as many people as possible and to channelize the savings mobilised for the welfare of the people. LIC has been promoting social welfare through investments in infrastructure and social sector including * Projects for generation and transmission of power, * Housing sector * Water supply and sewerage projects/schemes *Development of roads, bridges & road transport .., http://www.licindia.in/ (LIC Annual_Report_2011)	(a) Central and State Governments (b) Banks and financial institutions (c) Subsidiaries (d) Companies (e) (f) Municipalities (f) State Electricity Boards (g)State Road Transport Corporation (h) Co-operative Industrial Estates (i) Sugar Co-operatives (j)Housing Co-op Societies Ref: LICAnnual_Report_2011	As of 2012 LIC Infrastructure Bonds: •Term: 10 years •Minimum lock in period: 5 years •Loan on Bond: After 5 years •Interest Rate: 7.85%-7.95% after tax. •Exit options: Buy back or through Demat account •Open for Individual or HUF.	website : http:/indiabudget.nic.in Fund requirement for water supply and sanitation in the Tenth Plan Rs. 2500 crore

Table 4.2 Outline of Funding Implemented currently by Funding Institutions - continued

Institution	Area/Field	Loan Applicant/Joint Venture Partners	Loan Terms & Conditions	Case Studies
Infrastructure Leasing & Financial Services Limited (IL&FS)	IL&FS is an infrastructure development and finance company. Rather than disbursing loans, it participates and promotes development projects from concept to execution in joint ventures with various organizations. IL&FS has the requisite capabilities to take infrastructure projects from concept to commissioning in various sectors, such as transportation, power, finance, ports, water and waste water, urban infrastructure, and so on.	IL&FS has participated in various projects in joint ventures such as: Special Economic Zone, Public-Private Partnerships, JNNURM & UIDSSMT Schemes, Indian Power Sector, Tourism Infrastructure, Urban Public Transport Project, Hydro Power Development, Developing Sustainable Strategies to Finance Urbanisation, Indian Water Market, Integrated Development & Project Development Approach, Inland Water Transport Projects and so on.		Tiruppur Water Supply and Sanitation. In case of Tiruppur Water Supply and Sanitation scheme, a MOU was signed on 25th August 1994 between Government of India, TACID, TEA and IL&FS. The Concessionaire (Build-Own-Operate-Transfer) contract for a period of 30 years, has been granted jointly by the Government of Tamil Nadu and the Tiruppur Municipality to the New Tiruppur Area Development Corporation Ltd (NTADCL)

Table 4.2 Outline of Funding Implemented currently by Funding Institutions - continued

Institution	Area/Field	Loan Applicant/Joint Venture Partners	Loan Terms & Conditions	Case Studies
Housing & Urban Development Corporation Ltd (HUDCO)	HUDCO is a public sector company fully owned by the Government of India for financing housing and urban infrastructure in India. Its major activities include implementation of a variety of schemes –including low cost sanitation schemes; water supply; sewerage and drainage- for providing shelter and services. Categories of projects under Housing Finance include all types of Housing projects including Community Toilets, Slum Upgradation, etc. Eligible projects for HUDCO finance in Infrastructure Sector include construction, augmentation, and improvement of Water Supply Projects, Sewerage and Drainage, Solid Waste Management, Low Cost Sanitation, etc.	Eligible borrowers are: i) State level financing institutions / corporations ii) Water supply and sewerage boards iii) Development authorities iv) State functional borrowers for housing & urban development v) New town development borrowers vi) Regional planning boards vii) Improvement trusts viii) Municipal corporations / councils i) Joint sector companies ii) Cooperative societies / trusts iii) NGOs xii) Private companies/borrowers BOT operators, concessionaires	1) Extent of finance– Govt. Borrower -The loan amount for a project may be up to 90% of the project cost subject to maximum of 15% of Net Owned Fund (NOF) of HUDCO; and Private Sector Borrower - Loan amount may be up to 66% of project cost subject to maximum of 15% of NOF of HUDCO for a project/ SPC and up to 25% of NOF of HUDCO to group companies. 2) Tenure of loan is minimum 5 years and maximum 10 years (for private projects) & 15 years (for Govt. projects) including construction period /moratorium period.	Under its core infrastructure portfolio, HUDCO has financed a total of 430 water supply, 71 sewerage & 22 drainage projects with cumulative cost of Rs. 84067.85 crores and loan amount of 27542.77 crores in different towns. During 2011-12, it sanctioned a total loan of Rs. 5451.76 crores for 12 water supply, 6 sewerage & 2 drainage projects. The important projects in the recent past include Godavari Drinking Water Supply Project Hyderabad, Urban Drinking Water Supply Scheme Ranchi, Water Supply Scheme Dhanbad, Comprehensive Sewerage System Nellore, New Sewerage Scheme for Aurangabad & Integrated Storm Water Drainage System Jabalpur.

4.3.4 International and Bilateral Funding

Financial assistance is provided by international bilateral and multilateral donor agencies like the World Bank (WB), Asian Development Bank (ADB), Japan International Cooperation Agency (JICA), Advisory Services in Environmental Management of Germany (ASEM), British Department for International Development (DFID), Danish International Development Agency (DANIDA) and similar agencies. Some of these are grants for the report preparation for a new project or evaluation of an on-going project, while others are soft loans for capital works. However, they do not fund the O&M costs. There is also the bilateral funding between one country to another as grants of funds for the receiving country to import technical expertise from the donor country. An example is the twinning arrangement between the British and Indian governments between 1984 and 1989 to send British sewerage experts to reside and guide the CMWSSB. That exercise made a very positive change by introducing for the first time in the country the practice of submersible sewage pumps and today these have become the standard practice all over the country. There are many other such instances of bilateral assistance at other locations in the country such as the Delhi Jal Board (DJB), Indore and Varanasi STPs, etc.

4.3.5 Community Funding

There are mechanisms whereby the population to be benefited by a sewerage project agrees to meet the capital costs of a sewerage project. The sewered area will be improved in sanitary condition, convenience and comforts compared to unsewered area. Eventually, the value of the land in sewered area will increase. It is considered fair that the beneficiaries and end users pay the costs of the project within the parity of the benefit. Table 4.3 below shows the example of proposed or implemented community funding schemes.

Table 4.3 Example of Proposed or Implemented Community Funding Schemes

No	Project	Form of projects	Situation of plan or implementation
1	Alandur sewerage in Chennai	PPP	A part of capital cost was funded through public contribution. Collection of sewerage fee from the public (on a graded structure amounting to a weighted average of Rs. 75 per connection per month) amounts to Rs. 2 crore per month and covers both debt repayment and O&M costs of the AM
2	Community Managed Sewerage Scheme in Gwalior	Public Participation Scheme	Before implementation of this scheme, the proposal was discussed in the stakeholder's consultation with the residents of the slum conglomerate. It was decided that out of the total cost for the laying of sewer lines within the locality, a sum of Rs. 500 in five equal instalments of Rs. 100 per month will be collected from 2500 households, which the community agreed to contribute. The remaining amount was provided by the District Administration under public participation scheme of the Govt of Madhya Pradesh.

Source: 1. MoF, 2010.

2. Gwalior Municipal Corporation.

4.3.6 Corporate Social Responsibility

Corporate Social Responsibility (CSR), is understood as the responsibility of "haves" to allocate a portion of their revenues to upgrade the living of the "have nots" and the habitation by and large. Historically, it has been implemented by the erstwhile rulers towards, charity and philanthropy. With independence, the appeal by Gandhiji ***"I desire to end capitalism almost, if not quite, as much as the most advanced socialist. But our methods differ. My theory of trusteeship is no make-shift, certainly no camouflage. I am confident that it will survive all other theories."*** influenced business houses to establish trusts for schools and colleges. This helped in setting up training & scientific institutions.

The crucial phase of CSR is between 1960 and 1980 when the concept of public sector enterprises was pursued and private sector was driven almost to backseat. However, the public sector was effective only to a certain limited extent and in mid-60's reconciliation was initiated to more clearly implement the CSR towards the public. This has steadily grown to bring about a change in the current social situation in India in order to have an effective and lasting solution to the social woes. Partnerships between companies, NGOs and the government are in vogue to facilitate a combination of their expertise, strategic thinking, manpower and money to initiate extensive social forward change on a fast track.

In order to assist the businesses to adopt responsible governance practices, the Ministry of Corporate Affairs (MCA) has prepared the Corporate Social Responsibility Voluntary Guidelines 2009, which indicated some of the core elements and implementation guidance that businesses need to focus upon while conducting their affairs. One of the core elements is that companies should undertake activities for economic and social development of communities and geographical areas, particularly in the vicinity of their operations depending on their core competency and business interest. These could include: education, skill building for livelihood of people, health, cultural and social welfare, etc. In addition, one kind of implementation guidance indicates that companies should allocate a specific amount in their budgets for CSR activities. This amount may be linked to profits after tax and cost of planned CSR activities or any other suitable parameter. According to these guidelines, companies could undertake to fulfil their CSR commitment by funding activities related to sanitation and sewerage services in the communities (MCA, Corporate Social Responsibility Voluntary Guidelines, 2009).

The Companies Bill 2011, clause 135(1) states that "Every company having net worth of Rupees five hundred crores or more, or turnover of rupees one thousand crore or more or a net profit of Rupees five crores or more during any financial year shall constitute a Corporate Social Responsibility Committee of the Board consisting of three or more directors, out of which at least one director shall be an independent director. In Clause 135(5) states "The Board of every company referred to in sub-section (1), shall make every endeavour to ensure that the company spends, in every financial year, at least two per cent of the average net profits of the company made during the three immediately preceding financial years, in pursuance of its Corporate Social Responsibility Policy: provided that if the company fails to spend such amount, the Board shall, in its report made under clause (o) of sub-section (3) of section 134, specify the reasons for not spending the amount".

In specific reference to sewerage and sewage treatment, an initiative by industries to come forward to adopt decentralized sewerage systems in the region by incremental sewerage is useful.

This can be by “ownership” and use of the sewage for industrial uses is needed to attain the twin objectives of fulfilling the CSR by the industry and also fulfilling the resolution of challenges of environmental sanitation upgrades needed in the peri-urban and rural habitations.

4.3.7 Member of Parliament Local Area Development Scheme (MPLADS)

The MPLADS under the Ministry of Statistics and Programme Implementation (MSPI) is entrusted with the responsibility of implementation, progress review and monitoring of Member of Parliament Local Area Development Scheme (MPLADS).

The objective of the scheme is to enable Member of Parliament (MP) to recommend works of developmental nature with emphasis on the creation of durable community assets based on the locally felt needs to be taken up in their constituencies. Right from inception of the scheme, durable assets of national priorities namely, drinking water, primary education, public health, sanitation and roads, etc., are being created.

Under the scheme, each MP has the choice to suggest to the District Collector for works to the tune of Rs. Five crores per annum to be taken up in their constituency. Elected Members of the Rajya Sabha can recommend works for implementation in one or more districts as they may choose in the State of their election. The nominated members of the Lok Sabha and the Rajya Sabha can recommend works for implementation in one or more districts anywhere in the country. MPs may choose some works for creation of durable assets of national priorities namely drinking water, education, public health, sanitation, and roads under the scheme.

The Department has issued guidelines on scheme concept, implementation, and monitoring. The Department has also initiated all necessary steps to ensure that the scheme is successfully implemented in the field. The progress of the works being implemented under the scheme is monitored on a regular basis.

4.3.8 Public Private Partnership

Even during the pre-independence and the immediate post-independence periods, the infrastructure created by the Governments has been handed over to private parties to invest the money required to keep the services up-to-date, and levy their own fee and maintain the services. Examples are many in the electricity sector where even the power generation was under the control of such players. The recent Public Private Partnership (PPP) is thus nothing new. The major difference however is that the PPP model includes investing of money by the private player to develop the infrastructure also and its O&M for a number of years agreed to beforehand. The repayment is by the Government by way of billing and collection from the public. Details on PPP are provided in Chapter 6 of this manual.

4.3.9 Other Financial Revenues (Bonds)

These are floated by the Government not for a specific project but as a whole for the State. These generally carry better credibility for the safety of the invested money as the Government itself is the borrower from the public. The Government is of course required to guarantee the repayments on pre-agreed terms, when the bonds are encashed after their term or foreclosure.

4.4 REVENUE AND EXPENDITURE

These are two categories, namely planned and emergency. The planned category of revenue and expenditure is shown in Table 4.4.

Table 4.4 Planned Category of Revenue and Expenditure for Local Bodies

Revenues		Expenditures	
1	Property Tax	1	Power
2	Water and sewage charges	2	Chemicals
3	Sale of secondary treated sewage	3	Establishment
4	Surcharge for special events	4	Repairs and Renewals
5	Fines for delayed payment of tax and charge	5	Free services of water and sanitation
6	Interest on bank deposits if any	6	Water cess
7	Consultancy charges if undertaken	7	Depreciation on equipment
8	Loans from banks, institutions	8	Repayment of loans
9	Grant from state / central governments	9	Public announcements, websites, etc.
		10	Manpower

The emergency expenditures occur in case of occurrence of natural calamities like earthquake, epidemics, acts of war, fire, electrical faults, etc. Sometimes, it may become necessary for the local body to override public opinion and provide an entirely new facility on a war footing.

For example, we can recall the (in) famous case of the “Broad street pump” (now named Broadwick Street) in UK. The cholera epidemic of 1854 (which eventually claimed the lives of 616 people) was traced to the groundwater pumped out by a lone hand pump from this street. At that time, the fact that cholera is spread by drinking water contaminated with faecal matter of an infected person was not known. Though there were other hand pumps in other streets, the people were drawing their drinking water from this well only apparently because they found the taste was possibly more appealing. The pioneers John Snow and Reverend Henry Whitehead proved by circumstantial evidence that there was a sewage cesspool nearby and its foul matter was seeping into this tube well. There was nothing on record or otherwise for the local authority to deactivate this popular drinking water source. However, the fact remains that the local body decided and boldly deactivated this tube well. It was subsequently established that this hand pump water was the cause of the epidemic. This event showed the whole world what is water borne epidemic of cholera. In later day acknowledgement of the same, the monument of the deactivated pump still stands there as in Figure 4.1 (overleaf) reminding the whole world of the trade-off between what the consumers may insist and what the Government must resist. The population was saved from subsequent cholera epidemics as in Figure 4.2 (overleaf) by the lesson of this pump.

Clearly, in the cases of Figure 4.1 and Figure 4.2, the lesson is that local Governments may not blindly venture into a particular type of infrastructure facility merely because it is desired by the public. There is an obligation to educate the public and get a safer option installed.

Thus, revenue and expenditure can be a tricky procedure in some cases like these and other emergencies, such expenditures may also be solicited through voluntary contributions from those who can afford to help.

Source: http://en.wikipedia.org/wiki/1854_Broad_Street_cholera_outbreak

Figure 4.1 The monument of 1854 Broad Street pump of Soho, England

Photograph of cholera inoculation by the doctors in British India. This was possible mainly by the discovery of water borne transmission of cholera established by the forcible deactivation of the pump and the subsequent decline of cholera in the Broad Street episode and the discovery of cholera vaccine.

Source: Life Magazine - 1894

Figure 4.2 The File Photo of Cholera Inoculation by the doctors in British India

4.4.1 Billing and Collection

Revenue management is an important aspect of any sewerage & sanitation system as it governs the financial aspect. Fixing a tariff structure, and billing and collection of revenue plays important roles in financial sustainability. Sewerage tariff is normally added to the water use charges.

4.4.1.1 Tariff Fixation

The charges to be fixed by the utility must take into account the ability of the system to meet the following:

a. Operating cost (excluding establishment cost)
b. Establishment cost
c. Depreciation
d. Debt services (both capital repayment and interest)
e. Asset replacement fund
f. Capital development

Tariff structure should be fixed and revised periodically. Automatic increase of tariff periodically on an index basis can also be adopted. In many cases, the same authority also provides water supply services, and the charges for sewerage are included as a percentage of the water charges.

In setting tariffs, the first consideration must be a consistent transparent tariff policy endorsed by the Government. Demand management through higher rates for high consumption and a lifeline rate where there are urban poor, should be considered in the tariff structure.

4.4.1.2 User Categories

The users may be categorized as:

a. Domestic
b. Commercial (business entities, hotels, industries, etc.)
c. Government authorities
d. Partly commercial
e. Bulk consumers

4.4.1.3 Methods of Charging

The methods of levying charges can be any one or more of the following:

a) Metered system: Based on water consumption charges (with minimum fixed charge)

b) Non-metered system:

i. Fixed charge per house per month
ii. Fixed charge per family per month
iii. Fixed charge per tap per month
iv. Percentage of rateable value of the property.
v. Charge based on number of toilet seats in the house / building

As of 2012, in many cases, sewerage charges / cess are levied as a percentage of the water bill, or as a percentage of property tax. In addition, users also need to pay one-time connection charge at the time of connection. In areas where water meter is not available or not working, flat charges per household / connection may be adopted.

While the advantage of flat charges is that it requires no expense for installing and reading meters, the disadvantage of flat charges is that the customers pay either too much or too little for what they use and is not based on use. It may promote high water consumption. Therefore, if the system is not metered or water meter is not working, it is strongly recommended to promote installing meters or considering a plan for replacement of the meters. In addition, for any water utility to be financially self-sustainable the tariffs should be reasonably fixed and levied. The charges should be collected and accounted as accurately as possible.

4.4.1.4 Billing Process

The billing for sewerage is mostly included in the water bills. Various stages in the water billing process are:

a. Data gathering (meter reading in case of metered billing)
b. Preparation of bill based on collected data
c. Distribution of bill to consumer
d. Payment of the bill by the consumer
e. Sending the receipt details to billing section
f. Related accounting.

The frequency of billing depends mainly on the type of system used. For non-metered system the billing frequency could be quarterly and for the metered system the billing frequency could be bi-monthly. But in both cases all non-domestic, industrial and bulk consumers must be billed monthly. The only other factor which can be considered in this respect is the availability of manpower for billing process and the cost of issuing bills in one complete billing cycle. In many large cities, Water Supply and Sewerage Boards are responsible for billing and collection of water supply and sewerage charges. In medium scale cities, the PHED, Municipal Corporation/Council, Development Authority, etc., are responsible for raising the bills and collecting the revenue.

The payments of bills by consumers can be accepted at any one or more of the following:

g. Counters at various offices of the Board/Corporation/Utility
h. Various branches of bank/banks authorized for accepting payments
i. Door to door/on the spot recovery by concerned person/team
j. Electronic fund transfer through various banks offering such option/directly
k. By cheque through post or drop boxes
l. Through societies authorised by government, such as cooperative societies
m. On line payments
n. Automatic kiosk

4.4.1.5 Japanese System

In Japan, the sewerage charges are normally based on water consumption. The following methods are adopted for calculating sewage charges:

a. Volume of water consumed
b. Land size: When the sewerage system is started, the beneficiary is required to pay the services charge one time, which is estimated based on land/property size.

The volume of consumed water is based on meter (if available) as otherwise estimated. The methods of computing volume of consumed water for different cases are as follows:

c. When tap water is used: By reading water meter
d. When groundwater is used: Calculated using per capita consumption
e. Tap water + groundwater used: Meter reading + calculation based on per capita consumption

The sewerage charge is calculated as certain percentage (say 50-150%) of the total water charges. The sewage charges are added up along with the water use charges in the bills.

The billing is done usually once every two months. To reduce the cost, private agencies are hired for meter reading and billing. In future, it is also planned to transfer data through wireless system or to use same reader for reading meters related to gas, electricity and water consumption in order to further reduce the cost.

Upon receiving the bills, the user can opt for either of the following modes to make payment against their bills:

f. Counter of financial institutions & ULBs (Banks, Post office, Agricultural cooperatives, etc.)
g. Electronic bank transfer
h. Convenience store
i. Credit cards, etc.

4.4.2 Self-Sustainability

Two issues related to self-sustainability need to be considered as:

a. the extent to which the system can sustain itself without external support
b. the fraction of time in which the system is self-sustaining

Ideally, both these should be satisfied all the time. This is a question of balancing the revenues and expenditure. The expenditure cannot be curtailed to match shortage of revenue. The classical documents on this subject are the report by the High Powered Expert Committee (HPEC) for Estimating the Investment Requirements for Urban Infrastructure Services and the report of the sub-committee of the High Level Committee on Financing Urban Infrastructure in the 12th plan. The following extracts from these reports will bring out the situation analysis to enable decision making on remediation approaches.

a. The rate of development is clearly related to the rate of urbanization.

b. In the year 2009–10, GOI invested about Rs. 75,000 crores for the rural sector, while its disbursement under Central Urban Programmes was about Rs. 8000 crores.

c. This makes it evident that the urban sector continues to suffer neglect over the years, with policy and resources directed mainly towards the rural sector.

d. This neglect has now created a huge infrastructure challenge of having to cater both to the new population and the backlog of the past.

e. Given the current level of ULB finances and the traditional low viability of projects related to the water supply, sewerage sector and quality public transport, the private sector has stayed away from investment in the urban infrastructure sector.

f. A sanitation rating of 423 class-I cities done in 2009–10 by Ministry of Urban Development, GOI revealed that only 39 cities qualified on three basic water quality parameters of turbidity, residual chlorine and thermo-tolerant coliform bacteria.

g. Nearly 70% of the Gross Domestic Product (GDP) contribution from the urban areas, and the recent population projections indicating well over 40% urbanization in the coming decade, there is a clear need to focus attention towards the urban sector and to provide adequate financing for urban infrastructure.

h. However, given the multiplicity of institutions involved and the challenges of capacity availability and governance, it may be difficult to expect immediate results, unless conscious efforts are made to bring about all round improvement in urban infrastructure and services, besides improvement in local governance.

i. A study of municipal finances by the RBI in 2007 also revealed that the total revenue of Municipalities is growing at a lower rate compared to the growth of combined Central and State Government revenues. This is in contrast to the situation in advanced countries, where local bodies normally account for 20% to 35% of the total government expenditure and the principle of ‘subsidy’ is regarded as a cornerstone of fiscal federalism.

j. Revenues can be obtained from by-products such as raw material for factories, manure, poultry feed, industrial wastewater and so on. More emphasis should be laid on generating revenues through by-products instead of only concentrating on levying tariffs.

k. The service backlog in sewerage is assessed as in Table 4.5 overleaf.

l. The per capita investment cost and per capita O&M cost has been assessed as Rs.4,704 and Rs. 286 respectively at as recent as 2009–2010 prices.

m. The projected expenditure on sewerage for capital and O&M for the 12th plan is given in Table 4.6 overleaf.

Table 4.5 Service backlog in Sewerage in Stated Categories of Population

Class	Population	Network (%)	Treatment (%)
Ia	> 5 million	53	53
Ib	1 to 5 million	44	53
Ic	100,000 – 1,000,000	64	77
II	50,000 – 100,000	84	88
III	20,000 – 50,000	90	96
IV	< 20,000	100	100

Source: MoUD, 2012.

Note: Network backlog % is estimated assuming underground sewerage network for all city size classes and 100 percent collection and treatment of sewage.

Table 4.6 Projected capital and annual O&M expenditure for sewerage and all sectors in 12th plan

	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	Total
Sewerage						
Capital expenditure, Rs Crores	3,931	4,411	4,915	5,543	6,213	25,013
O&M expenditure, Rs Crores	4,299	4,675	5,097	5,569	6,098	25,738
Total	8,230	9,086	10,012	11,112	12,311	50,751
All Sectors						
Capital expenditure, Rs Crores	58,604	67,342	77,383	88,920	102,178	394,428
O&M expenditure, Rs Crores	70,328	75,919	82,150	89,094	96,830	414,320
Total	128,932	143,261	159,533	178,014	199,008	808,748

Source: MoUD, 2012.

4.4.3 Financial Planning

The requirement of funds for sewerage in the 12th plan is proposed by HPEC for the next plan period as given in Table 4.7 overleaf and has been accepted by the steering committee on urbanization set up by the Planning Commission.

The Financing Framework envisioned by HPEC is as given below. For realizing the shortfalls and potential impracticability in harnessing revenues, the HPEC has suggested a multi pronged strategy covering the following:

Table 4.7 Investment over the next Plan period as projected by HPEC for next 20 years with backlog covered in 5 years (Figures in % of GDP at current prices)

No	Item	2012-13	2013-14	2014-15	2015-16	2016-17
1	Total revenue	1.19	1.23	1.26	1.32	1.34
2	Own revenue	0.74	0.83	0.89	1.03	1.05
3	Exclusive taxes	0.33	0.33	0.34	0.34	0.35
4	Revenue-shared taxes	0.23	0.31	0.36	0.49	0.50
5	Non-tax revenue	0.19	0.19	0.20	0.20	0.21
6	Other revenue	0.46	0.41	0.37	0.29	0.29
7	Transfers from SFC	0.10	0.10	0.10	0.10	0.10
8	Grants-in-aid from State Governments	0.06	0.06	0.06	0.06	0.06
9	Transfers from CFC	0.08	0.08	0.08	0.08	0.08
10	Grants-in-aid from GOI	0.05	0.05	0.05	0.05	0.05
11	Revenues of entities other than municipalities	0.17	0.12	0.08	0.00	0.00
12	Total revenue expenditure	0.90	0.90	0.91	0.93	0.96
13	Annuity payments	0.00	0.00	0.01	0.02	0.04
14	Debt repayment	0.01	0.01	0.02	0.02	0.03
15	Reduction in revenues on the account of PPP	0.00	0.00	0.00	0.00	0.01
16	Investible surplus of municipalities	0.29	0.32	0.32	0.34	0.31
17	Capital expenditure	0.78	0.87	0.97	1.08	1.21
18	Deficit (-)/Surplus (+)	-0.50	-0.55	-0.66	-0.75	-0.90
19	PPP	0.02:	0.03	0.05	0.07	0.09
20	Annuity	0.04,	0.08	0.12	0.17	0.23
21	Borrowing	0.03	0.03	0.03	0.03	0.03
22	Land based instruments	0.07	0.07	0.12	0.16	0.16
23	Unfunded deficit (-)	-0.35	-0.35	-0.34	-0.33	-0.38

Source: MoUD, 2012.

4.4.3.1 Simulation of Municipal Own Sources

This should cover the following:

a. Efficient application of revenue instruments
b. Use of fiscal monitoring and control innovations

4.4.3.2 Taking Citizens into Confidence

It is also necessary to take the citizens into confidence in relation to determining the levels of user charges by increasing property taxes, land monetization, enhancing floor space index, etc.

4.4.3.3 Devolution of Fiscal Powers and Funds

A significant share of the revenues for the Municipalities would come from a constitutionally mandated revenue sharing arrangement as recommended by the HPEC and adopted by the Working Group.

4.4.3.4 Scaling up the PPP

Some interesting examples may be mentioned in respect of the sources of financing the investment needs for urban infrastructure.

One such instance is the re-development of airports. While the Kolkata and Lucknow airport re-development projects have been undertaken by the Airports Authority of India (AAI), at a cost in the order of Rs. 2,000 crores each, a similar project for Delhi has been implemented at zero cost to the Government, but the project even gives sustained revenue returns to the Government in the revenue-sharing arrangement built in the model.

4.4.3.5 Annuity Model

The infrastructure projects in urban sub-sectors to be implemented in PPP should be encouraged for annuity models too. This is necessary because some such projects, particularly in smaller cities, may not be financially viable by themselves and would need yearly financial payments from the sponsoring municipality.

4.4.3.6 Double Entry Accounting (DEA)

States have to push accounting sector reforms through DEA for necessary provisions / approvals to apply at the ULB level so as to build transparency and borrowing capacity among Municipalities.

4.4.3.7 Budget Rationalization

Budgeting needs to be rationalized for normative performance oriented, participatory budget, which is implemented throughout the year in a fixed manner.

4.4.3.8 Innovative Asset Management

Innovative asset management, which includes listing, classification, valuation and finally assessment of each asset for optimum utilization of its revenue potential, needs to be practised.

4.4.3.9 Local Bodies Finance List (LBFL)

Local bodies finance list along the lines of the Union and State Lists aims to empower Municipalities to exclusively levy property tax, urban infra cess along with property tax, profession tax, entertainment tax, and advertisement tax and retain the whole of their proceeds (hereinafter referred to as 'exclusive taxes').

4.4.3.10 Sharing of Revenues

Sharing of a pre-specified percentage of revenues from all taxes on goods and services which are levied by States to enable municipalities to meet their functional responsibilities assigned to them by the 74th Amendment (hereinafter collectively referred to as 'revenue-shared taxes').

4.4.3.11 Specific Actions

A set of specific actions that can be taken are presented in Table 4.8.

Table 4.8 Exclusive actions suggested by HPEC for Municipalities

Area	Actions
Accounting	• Introduce double entry accounting • State to prepare accounting standard and coding • Develop financial statements and ratio analysis
Budgeting	• Introduce budget cycle, apply innovative performance budgeting, apply participatory funding
Asset Management	• Listing and classification, assessment of revenue and potential
Procurement	• Standardisation of procurement system, E-procurement of services and goods
Auditing	• Timely audit, private/concurrent audit, social audit, effective internal audit, energy audit, citizens charter
Information System and Feedback Mechanism	• Performance monitoring and service level benchmarking as per GOI / norms / indicators, complete automation, initiate GIS application
Billing and Collection	• Timely billing, use of IT & advertisements, prepare DCB statements, ABC analysis of arrears, innovative collection
Grievance Redressal	• Decentralised system of grievance redressal, promote downward accountability - social audit, area sabha, citizens charter, promote E-Sewa Kendra, initiate one window approach
Capacity Building	• Three Tier Training - awareness, class rooms, hand holding/on job training, documentation and dissemination of best practices, incentive system for good performance, suitable material (Manual, checklist, guidelines) exchange/study visits, city to city cooperation, budget allocation for capacity building and in house capacity building

Source : K. K. Pandey, 2011

4.4.3.12 Why PPP is not Taking off in Sewerage

There are barriers for private sector investments in urban infrastructure in India, more so in the critical water supply and sewerage sub sectors. A quick review of the relevant literature indicates a number of reasons for the reluctance on the part of the private sector to assume commercial risks in a majority of the urban sub sectors. These are mainly: (a) Most of the urban sector investments involve three tiers of governments, which increase the perceived risks for private sector investments and (b) Historically, water supply and sanitation services have been seen as “public goods” that need to be provided at affordable prices (meaning nominal low costs). Also see Chapter 6 for details on PPP.

4.4.3.13 Municipal Bonds

Municipal Bonds form nearly 10% of the debt market in the US. By contrast, in India, just 1% of the total ULB contribution is funded by municipal bonds. Hence, municipal bonds have played a limited role as a source of finance for funding ULB contribution for urban infrastructure projects. A number of regulatory, supply and demand side constraints exist which need to be tackled in order to promote municipal borrowing as a significant source of funding local bodies. However, it is relevant to note that development of Municipal Bond Markets have taken about 100 years even in USA.

4.4.3.14 Repayment Tenure

The tenure of the term loans for urban infrastructure too needs to be reviewed. As most such projects have life of 20 to 30 years, and the user charges would be able to generate only small surplus, if at all, after paying up the O&M expenses, it would be necessary to extend the loan repayment period for the term loans availed by the developer/concessionaire of such projects.

4.4.3.15 Empowering Municipalities

Fundamental to the framework is the need for Municipalities to increase their own sources of revenue. Failure to do so will put at risk the ability to use other financing instruments like PPPs or borrowings. A weak revenue scenario, with borrowing or PPPs being ruled out, will put further strain on the GOI to support the State governments and Municipalities in urban infrastructure financing. Accordingly, the design of the New and Improved Central Programmes should be such that it creates an environment for Municipalities to increase revenues through better service delivery, which will cause upward revision of the user charges and other revenue streams.

4.4.3.16 Need of the Hour

The urgency to deploy more investment through these sources is necessitated because of the precarious position of the resource generation (own revenue) capacity of our cities. The need to utilize the avenues of funding through these sources has to be explored in the 12th Plan. Any lag or slippage in this regard would put a lot of stress on the ability of cities to deliver services effectively and reduce economic activity also. This view needs to be revisited because urban areas will increasingly accommodate a greater portion of the total population of the country. Financing for urban infrastructure needs to be stepped up to the level of 1.5% of GDP in the next plan and it should increase to 2.0% by 2021–22 and 2.2% by 2031–32.

4.4.3.17 MoUD Recommendations

The MoUD in its advisory note on Recent Trends in Technologies in Sewerage System has concluded that, “As the current sewage tariff levels are too low across ULBs in India and do not reflect the true economic cost of providing sewage collection, treatment and disposal services, increasing tariffs to a level that ensures the sewerage system generate sufficient revenues to meet its capital and O&M costs and become self-sustainable may not be possible in one stroke. This could be achieved by increasing tariffs gradually over a period of time.”

4.4.3.18 Willingness to Charge

There is growing evidence that many urban and rural communities are willing to pay more than the prevailing rates for water and sanitation, if they are convinced of more reliable service. However, governments seem unwilling to match this with a willingness to charge the consumers for the services and the result is a continuing cycle of low revenues, high costs, unsatisfactory services and financial crisis. Policy makers frequently refrain from raising tariff rates fearing that the people will not want to pay. If policy makers can establish what households are willing to pay, they should be able to:

- Revise tariffs to capture this willingness to pay;
- Plan future investment keeping in mind what consumers really want; and
- Move towards financial sustainability and independence.

4.4.3.18.1 Political Will towards Tariff Revision

In the matter of electricity, the levy of tariff is guided in that sector in compliance with section 3 of the Electricity Act 2003. The guiding principles therein state that the tariff should “encourage competition, efficiency, economical use of resources, good performance and optimum investment” and “progressively reflect cost of supply of electricity” and also “reduce cross subsidies”. Such a guideline is not traceable in the management of the water sector. Of course a practical view of the physical aspects of the two services brings about the inherent difficulty in the water sector. This is due to the fact that whereas the electrical supply cannot be polluted, the water supply can be polluted by ever so many factors which are not entirely in the control of the water authority. Moreover, levy of tariff for sewage is to be related to the quantity of sewage but this cannot be measured from each user because meters will get choked and plugged and hence, tariff based on volume of sewage is linked to tariff based on water supplied to the user.

As such, it is water and sewerage tariff as an integrated methodology. This being so, running a water authority on a self-equated basis of revenue vs. expenditure is not all that easy because the supply of drinking water is not an entirely commercial proposition in India. All the same, the levy of tariff even if it is to be incremental in small measures becomes a matter of political overtones as well. This is specifically compounded by the fact that supply of water “drinkable from the tap” is neither financially feasible not physically worthwhile in the mixed types of economically weaker segments, physical damages to infrastructure by other agencies and above all the capital cost of such a facility. Thus, it is an issue which does not have a single countrywide answer but localized answers to evolve as unique strategies for given locations.

4.4.3.19. Willingness to Pay

This is a confidence building process. It can be compared to the famous chicken and egg syndrome. Unless the people see the benefits, they will not be willing to pay. Unless they pay, the local body will not be in a position to improve the services. A method of solving this issue is to fix the initial price of a new service with a buffer, which can be developed as financial asset and used when needed.

4.4.3.20 Case of Alandur Sewerage through Community Funding

This is one of its kind of PPP initiated as early as in 1996 for a population of 165,000 with nearly 25% in economically weaker sections. The town did not have an underground sewerage system. A sewerage scheme for 12-MLD intermediate capacity and 24-MLD ultimate capacity with underground sewers and a mechanized sewage treatment plant was formulated and sanctioned in 1999. The funding pattern was conceived as in Table 4.9.

Table 4.9 Funding pattern (in Rs. Crores) proposed for the Alandur PPP sewerage project

No.	Source	Amount	Interest
1	Grant from TNUIFSL	3.00	
2	Grant from TUFIDCO	16.00	
3	Loan from TNUIFSL	6.11	15 years at 16%
4	Loan from TUFIDCO	1.00	8 years at 5%
5	Public contribution	12.40	
6	Interest on deposits	2.46	
7	Total	40.86	

Source: MoF, 2010.

The municipality targeted to provide about 22,000 connections both for domestic and non-domestic categories of users by end 2004–2005 at the one-time charge as shown in Table 4.10.

Table 4.10 One-time Sewer Connection Charges (in Rupees) proposed by the Local Body

No	Category	One-time deposit
1	Domestic	5,000 per connection
2	Commercial	10,000 per connection
3	Industrial	10,000 per connection

Source: NUS, 2009

It was anticipated to generate nearly Rs. 13 crores to be put into a revolving fund for repayment of loans to the lenders. In addition to the above, it was also decided by the municipality to collect sewer maintenance charges as shown in Table 4.11 (overleaf).

Table 4.11 Monthly Sewer Charges proposed to be levied by the Local Body

No	Category	Monthly charge	Yearly increase	Upper Limit in Rs.
1	Domestic	150	6%	180
2	Commercial	450	6%	540
3	Industrial	750	6%	900

Source: World Bank, 2010

As of 2005, the monthly charge and one-time deposit have been reported to have been adopted on a graded pattern for the domestic, commercial and industrial sectors based on the area of the premises as in Table 4.12.

Table 4.12 Graded Tariff Structure for UGD (Sewer) connections

No	Area (ft^2)	Domestic connection		Commercial and Industrial connection	
		Monthly charge (Rs.)	Deposit (Rs.)	Monthly charge (Rs.)	Deposit (Rs.)
1	< 500	60	6,000	200	13,000
2	500 to 1500	80	7,500	400	16,000
3	1500 to 3000	100	10,000	600	20,000
4	> 3000	120	20,000		
5	3000 to 5000			800	30,000
6	> 5000			1000	1,00,000

Source: GOTN-TNUDF, 2007.

4.4.3.20.1 Assessment of the Value for Money

This exercise has brought out the following as in Table 4.13 (overleaf)

4.4.3.20.2 Beneficiary Participatory Approach

People's participation in the project, including the fact that almost 29% of the project cost was garnered from public contributions, was the most outstanding aspect and learning from the ASP. The project established that mobilizing people's participation for infrastructure projects is possible through collective efforts and transparent procedures. The success of the project from the outset depended highly on effective collection of connection charges and monthly sewer fees as also public acceptance of engaging a private BOT participant. Community awareness, support and on-going cooperation were therefore, critical. The aggressive public outreach campaign conducted by the municipality and GoTN and the engagement of stakeholders was essential to assure the lending agencies and city officials that repayment provisions would be met.

Table 4.13 Difference made by the Project in terms of Value for Money

No	Parameter	Situation prevailing before the project	Situation which would prevail after the project
1	Urban Service	No sewerage system	Sewerage system
2	Urban Service	Septic tank & Sullage collection	Full-fledged Sewerage
3	Urban Service	Sewage entering storm water drains	Entry to storm water drains stopped
4	Environment & Health	Storm drains in turn polluting environment	Storm drains are clear of sewage flows
5	Environment & Health	Contamination of groundwater and soil	Contamination would be stopped
6	Public Participation	No participation	Mutually agreed participation
7	Payments by Public	No payment	Average of Rs. 75/ month per connection

Source: DEA, MOF, 2010

4.4.3.20.3 Stakeholder Involvement and Interdepartmental Coordination

Continued involvement of stakeholders throughout the project ensured timely completion of the project and addressing of issues even as they arise. To maintain support for the project, a citizen's committee was formed and it met frequently to review the status of the project, monitor performance of the BOT contractor and provide a forum in which citizens could air their concerns. The ASP established that close involvement of all stakeholders / departments at the key decision making stages, as also for review and monitoring, is critical to ensuring that the project stays on-track.

4.4.3.20.4 Political Will and Strong Decision Making, Especially at the Grass-root Level

The ASP demonstrated that 'political will and quick decisions make projects happen'. The political leadership and strong advocacy for the project provided by the chairman and council of the municipality proved to be the critical element of the success. While strong support for the sewerage system within Alandur existed, political will was essential to convince the customers and citizens to pay a significant share of the cost and accept the entry of the private sector, throughout the project decision-making stages.

4.4.3.20.5 Acceptance of Fiscal Discipline

The term lenders, TNUIFSL and TUFIDCO, placed strict lending conditions on the municipality, requiring the municipality to accept and implement strong fiscal discipline measures. TNUIFSL required the municipality to establish a separate sewer account distinct from the general budget of the municipality, forcing discipline and transparency on the officials managing the system. The municipality was also required to limit new debts to a certain percentage (typically 30%) of their revenue. GoTN, which provided loan guarantee, stipulated that any payment made to these entities on account of default by the municipality would be recovered from the annual transfer of payments from the municipality to the State government.

Similarly the contractual obligations and agreements between the municipality and the BOT operator forced the municipal government to ensure timely payment for management and sewage treatment services. Thus, the loan as well as contractual obligations ensured strong fiscal discipline by the municipal body, by making it take difficult decisions on capital priorities, closely oversee the sewerage system management, and ensure budgeting of sufficient funds to meet payment schedules.

4.4.3.20.6 Implementing an Effective Fee System

Despite the willingness-to-pay survey that indicated that public willingness was far below the tariff requirement to meet the capital and operational cost of the project, the municipal council, through its rigorous public outreach measures, managed to impose reasonable levels of connection charges and sewer fee on the public. The municipality also managed to collect the connection charges fairly well in time to pre-empt the need for the TNUIFSL loan. A large part of the success of the municipality in this aspect sprung from the fact that they provided sympathetic measures that addressed the concern of the public. For example, the connection deposits were collected in two instalments as per the convenience of the consumers; the local branch of the Punjab National Bank also offered financial support to the citizens of Alandur by creating a scheme for lending the connection deposit amount to them.

4.4.3.20.7 Assurances on Payment to the Private Sector Participant

The municipality agreed to provide the BOT operator a minimum level of income by accepting the ‘take or pay’ condition in the Agreement. Thus, the municipality assumed the risk of minimum payment to the operator while the private partner assumed all other responsibilities and risks of financing, constructing and operating the STP for a period of 14 years.

4.4.3.20.8 Access to Finance for the Municipality

An important aspect of the success of the project stemmed from concession financing and subsidies from the Government and public-private entities, established specifically to meet the credit needs of the municipalities without access to private capital, due to a low or non-existent credit rating. Though almost 30% of the capital was generated by the municipality from connection fees, grants from GoTN and loans from TUFIDCO were crucial. The loan agreement from TNUIFSL, while proving to be unnecessary in the end, was imperative for participation in the finance package by all the parties.

4.4.3.20.9 Technical and Financial Assistance

The expertise needed to plan and manage the technical and financial aspects of the project far exceeded the capacity of the municipality. Assistance from the other government bodies in the state, the Corporation of Chennai (CoC), and sources, such as the USAID’s FIRE project, was critical. TNUIFSL and FIRE played a substantial role in structuring the project, managing the feasibility studies, and preparing the bid and contract documents crucial to project success. The review and approval of the engineering reports by the management committee, consisting of senior officials of the AM, the TWADB, CMWSSB, and TNUIFSL, were essential for successful project management.

4.4.3.20.10 Transparency in Bidding and Contracting Procedures

The transparent approach to the project, right from inception to selection of contractor/operator and implementation, was critical to providing the necessary assurance to the private sector bidders on the professional approach of the municipality. This included strict application of WB and FIDIC processes, oversight and approval of the process by the WB. Public participation in the deliberations of the management committee overseeing the tendering process execution was also important.

4.4.3.20.11 In Retrospect

The project might not have materialized in the financial model as originally foreseen. This is because of the payment of sewer charges by the population, which had to be reduced after implementing the project according to the wishes of the people and made up by subsidy by the local Government. But the fact remains that the project is the first of its kind in the country and has set a trend in implementing sewerage projects by the local body and the population without looking up to the Government completely. The sewerage system component of the project was financed through several sources and the STP on the other hand was financed entirely by the contractor.

4.4.4 Methods of Raising Revenue

Each local body is an entity by itself. The successful model of one local body may not be successful in another. This depends on many local factors. For example, reuse of treated sewage for agriculture and farm forestry may be fine in desert areas of Rajasthan, but may not be appropriate in a water rich municipality in Kerala with no industrial activity. Similarly, artificial recharge of advanced treated sewage to stop sea water intrusion may be suitable for locations in coastal Puducherry, where there are no storage reservoirs and the entire public and agricultural water is almost entirely being drawn from groundwater and in coastal Gujarat locations where sea water intrusion is occurring and industrial activity is high. However, this may not suit a location like the Kolkata estuaries. Methods of raising revenue from such uses are almost entirely dependent on the local situation.

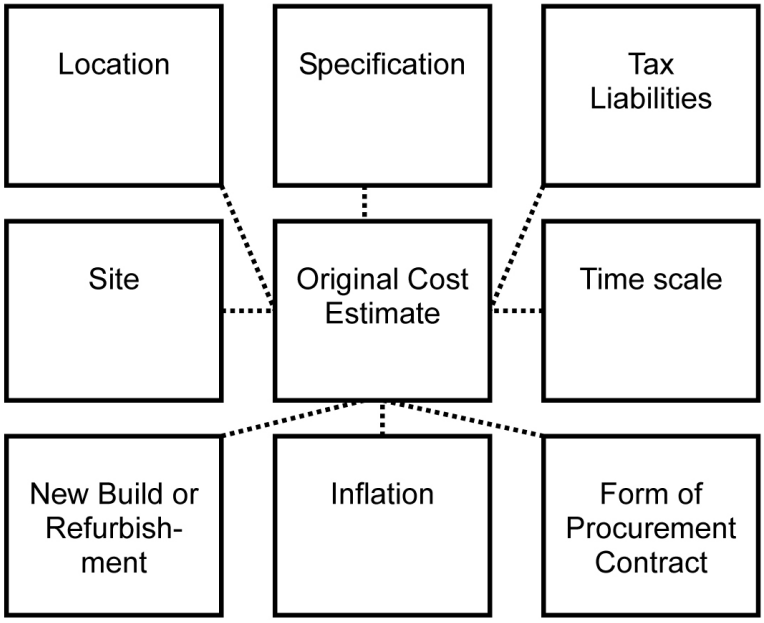
4.4.5 Computerised Billing Systems in Sewerage

Unlike a water supply system, it is not possible to meter and measure the volume of sewage discharged by a household. This is difficult in practice as the meter will immediately get choked with biological growth. The simpler method will be to link it to the volume of water used and measured by a meter. In cities where a flat system of billing is being practised, the costing must be based on real time expenditure and a corpus fund and this of course will need powers to levy by the local body. Such powers will however be only of academic interest because it is the political will and State-wide approach of the Government in place.

4.4.6 Monitoring and Accounting the Expenditure

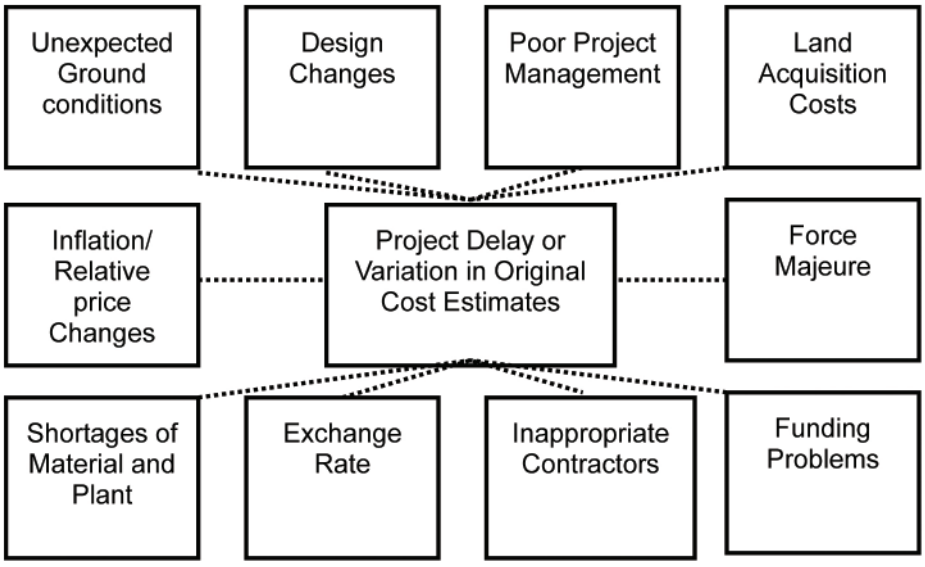
Simple monitoring of expenditure is a routine task. It accounts for all the expenditures in its appropriate head like machinery repairs, payment to contractors, disbursements of salaries, etc. It is needed to verify that the allocation is not exceeded. Given the objective of this whole chapter, such routine monitoring of expenditure is of no use.

It will only show the gap between the revenue and expenditure, but not the method by which the expenditures could be restricted. This is again a multi-disciplinary exercise and cannot be ascertained by the financial manager alone. It requires a joint brainstorming of engineering, administrative, finance and public representation. Even if this is carried out periodically, still there is no guarantee that projects can be completed in time and within the allocations of money. The intangibles that slowly creep in are shown in Figure 4.3 herein and Figure 4.4 herein. It can be easily understood that Figure 4.4 is a reality in almost all sewerage projects. Some of the drivers to this eventual state of affairs are as follows:



Source: http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/5_full_en.pdf

Figure 4.3 Key Determinants of Costs in a Project Implemented as Planned Initially



Source: http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/5_full_en.pdf

Figure 4.4 Cost Changing Factors in a Project with Time

a. Lack of planning and co-ordination
b. Poor communication between members of the project team and the project sponsor
c. Failure to identify problems and institute necessary design and programming changes
d. Lack of control over time and cost inputs.

These are easier to say than control, in the real sense. The potential impacts on key project components can be as shown in Table 4.14.

Table 4.14 Effect of Major and Minor Cost Changing events on Project Costs

	Cost-changing Factors					
Cost Estimates	Design costs	Land Acquisition Problems	Poor Project Management	Unexpected Ground Conditions	Inflation/ Relative Price Rise	Difficulties with Contractors
Planning / Design Fees	1		1		2	
Land Purchase	2	1	2		2	
Site Preparation	2		2	1	2	2
Building & Construction	1		1	2	1	1
Plant & Machinery	1		2		1	2

1 denotes relatively major effect – potentially 20% change for affected cost elements
2 denotes relatively minor effect – typically 5% change or less for each cost element affected.
“Site Preparation” is identified as a separate element of Building and Construction costs because it is here that the main effect of unexpected ground conditions is experienced.
Source: http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/5_full_en.pd

It is not possible evidently to formulate in advance these issues and the extent of their impacts. But then, a good Management Information System (MIS) should be able to present the indications by way of comparison of the historical events of other projects in the same local body jurisdiction because the required information is readily available. An example can be the costs of laying sewer in dense old cities and new development areas. The costs as well as time overruns in both these cases will be vastly different due to many reasons. The most potent reasons will be excavations adjacent to old structures and narrow streets in the old cities and most often land acquisition issues in new development areas. If the MIS has a database of such issues and factored into the costs, it will be a warning system enabling anticipation of higher expenses on the components of a project, and will accordingly enable planning for meeting the eventuality of increased expenditures, which have to be overcome.

A national network of such an MIS developed on a few issues as above can serve to facilitate the monitoring of finances in a project and account for increased expenditures as the case may be. It will also be useful to go into the following drivers of a project during the launch of the project, recognize them and their future impacts on expenditures and build a cushion in the MIS.

a. Where is the project being undertaken?
b. What exactly does the project comprise?
c. Why is the project being undertaken – what is the demand?
d. What phases have been undertaken and what phases are now included?
e. Is this project directly dependent upon any other projects?
f. Who is undertaking the project and over what time period?

For example, phase-I of a sewerage project must have been in the old city and phase-II may be in the developing city. Both fall under the same sewerage project, but they will respond differently. It is possible to do this exercise stage by stage as the project proceeds, as in Figure 4.5 overleaf. It may be seen that for each stage, parallel groups of project interrogation questions are also included. These groups of questions are discussed in the following text as “Risk Issues”. Some questions are relevant at more than one stage. When interrogating a project, desk officers should first establish the stage of development of a project and then use the relevant questions. The figure also shows graphically how risk (of cost and time over-run) decreases as a project progresses. The formulation of such models and incorporating these into the MIS is a strong felt need if the expenditures are to be justified and accounted for promptly. This will avoid the projects from being held up for want of approvals for deviations, and which in turn again pushes up the expenditures.

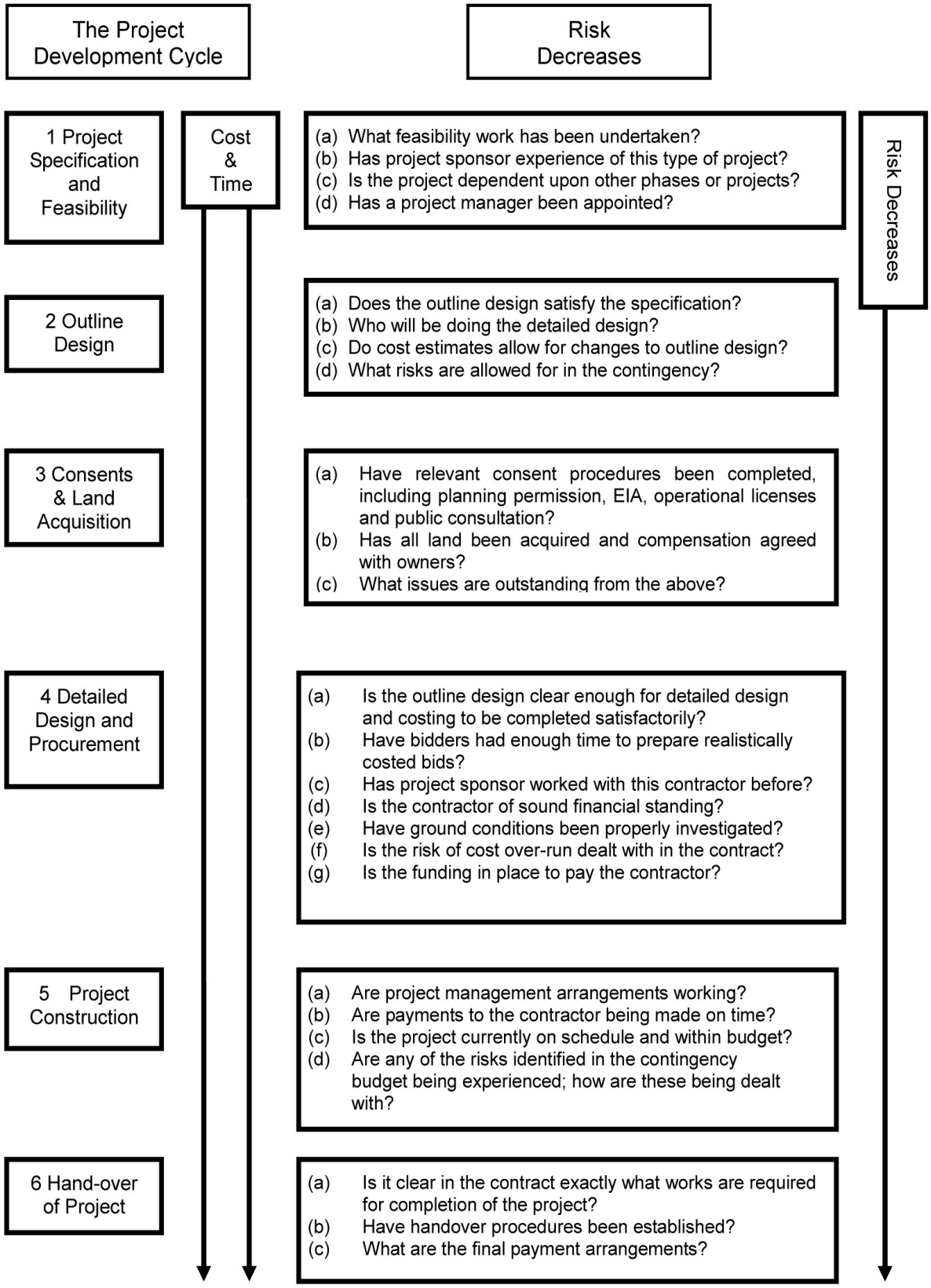
This type of MIS will ultimately be in the interest of the country as a whole in the quicker implementation of sewerage projects, which run into many years in their present trend. The quickening will be because increased expenditures can be foreseen, justified and accounted for without wasting months of paper work and committees. This will also ensure that funds may not have to divert from one project to another because a contingency fund will be available at the beginning of the project itself which will not be used in the routine expenditure and which will come to the immediate rescue when the above events shape up. Even now in the estimates prepared for Government projects there is a provision under the head “unforeseen” and is a very meagre amount, which is otherwise calculated to round off the project cost. Instead, the effort should be to provide for this as “foreseen” and realistically based on information of similar projects locally and elsewhere. Even with all these, this may not totally eliminate some eventualities as “compensations”, “deviations”, “arbitrations”, etc., but these will at least reduce these incidences drastically.

4.5 TECHNICAL AND FINANCIAL APPRAISAL

These are to be carried out after the Detailed Project Report (DPR) has been completed and before deciding the allocation of funds for the project. The idea is to make sure that the following do not happen:

a. The project as completed is not readily acceptable by the public.

The investment does not result in a completed project, which is not acceptable by the public in physical shape and financial payments by them. Most often, sewerage schemes are launched straightaway without consulting the public. The sewerage scheme consists of the ultimate stage of underground sewers straightaway. The STP is of course a standalone component. After implementation, the public do not come forward to avail of the house service connection and the local bodies are unable to enforce it mainly due to lack of political support.



Source: http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/5_full_en.pdf

Figure 4.5 Project Development Stages and Risk Factors related to Financial Management

Moreover, the technology of incremental sewage starting from the twin drain concept as detailed in Part-A manual in section 8.4.4, limiting the immediate investment on collection system to possibly only about 10% of what is needed for underground sewerage might not have been considered. If such a staging of the project is taken up, the public may not resist paying their dues because the cost will be very much less and they know that sewage will not stagnate on the streets. When the public do not avail the house connections, the project is a non-starter.

b. The completed project does not generate the revenue for repayment of loans, etc.

The situation above results in a position where there is no generation of revenue and the repayments by the local body to lender banks, institutions, etc., are not possible and even the bills of contractors remain unpaid. When a local body loses its credibility, future schemes and projects also suffer because no one comes forward to invest. This exercise is carried out by a two-stage appraisal namely, technical and financial.

4.5.1 Technical Appraisal

In the technical appraisal, the issues which need to be reviewed are given in Table 4.15.

Table 4.15 Scope of Technical Appraisal of a Sewerage Project Proposal

No	Components	Significance
1	Project Objectives	Is the project postulate a priority at this time amongst other objectives and is the chosen objective a priority?
2	Assumptions of Growth	Not only population growth but the direction of growth on land so that the sewage treatment volumes and locations are correct?
3	Methodology of Project Preparation	Whether local data have been analysed and used or merely copied from elsewhere or from other reports
4	Dependability of the chosen system	Whether alternative technologies have been duly evaluated for ultimate economy and proven dependability
5	Review of Work Plan	Whether it is proven in the region and whether it has taken note of lessons of earlier work plans
6	Proposed Organizational Structure	Whether competent persons are available and if not what is the proposal to get their services in place
7	Arraying of collection systems	Whether the incremental sewerage evaluated with the type of area development and the repayment capacity of the wards
8	Cost Estimates	Whether Government approved rates are used and how the project cost compares with other projects in the region
9	Willingness of public to accept the project	Whether the population is willing to pay for population 30 years from now and whether more economical systems are required

4.5.2 Financial Appraisal

The idea here is to ensure that the project becomes readily acceptable to the public within their payment capacity and the issues, which will be reviewed will be as in Table 4.16.

Table 4.16 Scope of Financial Appraisal of a Sewerage Project Proposal

No	Components	Significance
1	Proposed financing	Whether letters of commitment are obtained from lending institutions and whether the liabilities have been made public
2	Investments in first time technologies	If the technology chosen is a first timer, what securities are modelled for the safety of the public money?
3	Financial investments needed	Clarity of real-time cost resources of the local body and justification for ability of repayments of capital and interest
4	Liabilities to local body	Whether the public will take house connections immediately and if not how the local body will do the repayments
5	Financial sustainability	Whether corpus fund generation is included to be able to meet emergencies if any in future

In actual practice, these are two exercises that are carried out simultaneously. The experts carrying out these appraisals are different groups. Once these two appraisals find that the project proposals are acceptable for a safe investment of public funds, the next step will be to evaluate the social and environmental aspects of the same.

4.5.3 Social and Environmental Appraisal

Basically, sewerage is an environmental enhancement affair. If at all environmental negative aspects arise, it is only from residues of the project and that too, when there are human failures.

As such it is only the social appraisal which is relevant to predict the acceptability by the users.

The purpose of the social appraisal is to ensure that proposed project components are socially sound and sustainable and that adverse social consequences of the project are recognized at early stage and taken into account in the project planning and design.

The major objectives of carrying out social appraisal are:

a. To establish baseline data on social conditions of the project area

b. To predict the impacts on relevant social attributes due to the construction and operation of the proposed project

c. To suggest appropriate and adequate mitigation measures to minimize/reduce adverse impacts, and

d. To prepare mitigation and monitoring plan.

Various considerations to be made for undertaking social and environmental assessment include the following main items:

e. Impact of project must be assessed and examined from the earliest planning stage. Alternatives or minimization measures to prevent or reduce adverse impact must be examined and incorporated into the project plan.

f. Social concerns shall include: involuntary resettlement of the affected population, local economy such as employment and livelihood, the indigenous people, equality of benefits and losses and equality in the development process, cultural heritage, landscape, gender, children's rights, local conflicts of interest, working conditions including occupational health, etc.

g. Projects must comply with laws, ordinances and standards, policies and plans related to social and environmental considerations established by the governments that have jurisdiction over project site (including Central and State governments).

h. Projects must be adequately coordinated so that they are accepted in a manner that is socially appropriate to the locality in which the project is planned. Appropriate consideration must be given to vulnerable social groups, who are susceptible to social impact.

i. Information disclosure and accountability also need to be addressed.

Financial appraisals are to be evaluated as to whether they are really acceptable. The reason is this may lead to entirely wrong conclusions in cost-benefit. For example, let us consider a project proposal with various collection systems in various parts of the local body like twin drain in newly developing localities, underground sewerage in recently developed, well-laid layouts almost fully occupied and private on-site system backed up by sullage removal services by the local body.

Financially this proposal can be explained and the population satisfied, but the various sections which do not have the underground sewerage immediately will not have the same benefits as the section with underground sewerage. Clearly, quantifying the benefits of these into monetary values is at best a guessing game.

A case study of how this cost-benefit becomes a fraud in the decades to come can be the UNEP test model format, which was applied by the UNEP, AU and CMWSSB to evaluate and justify investments on mechanized STPs in huge grass farms fed by raw sewage and the grass sold to cattle in the city during the 1980's. The social issues were listed out in that exercise as in Table 4.17 overleaf.

With all these uncertainties, a compilation was made by the said UNEP-AU-CMWSSB study to quantify the cost benefits as shown in Appendix C 4.1.

The social benefits as listed in that report in respect of health (Annex IV, e) siting of fisheries harbour (Annex-IV, f), treated sewage at four places earning revenue from industries (Annex IV, g) never really occurred even after 30 years. Out of the calculated benefits of Rs. 49.949 lakhs per annum, the amount of the benefits of the three items cited above is Rs. 35.723 lakhs per annum. Thus the actual benefits is only (49.949-35.723) / 49.949 = 28%. At that time, the benefit and cost was shown as almost I (Annex V).

Table 4.17 Social Issues considered in Appraising the Changeover to Mechanized STPs at Chennai

No.	Social Issues	Relevance to the Social Cost Benefit Issues
1	Closing of the grass farms	Grass farms were the state of the art in almost all cities having a sewer system in those days. At the same time, feeding the cattle in the city started creating problems. The shed owners washed away cow dung into sewers during non-peak times causing immediate sewer blocks. It generated sulphide and methane. People were not permitting ventilating shafts and these gases started to leak through manholes on streets. Automobile engines plying over the manholes were exposed to inflammable methane. Actually the answer lay in the complaints by the people about these gases coming out of manholes in roads. It was easy to convince them to accept the project of (a) moving cattle away to an organized co-operative, (b) erecting a mechanized STP and (c) using the treated sewage to grow grass in the new location. Finally, as real estate was so expensive the relocation of cattle into a co-operative did not take place. The cattle got dispersed in small numbers to outlying class 3 habitations. Clearly, the benefit here is only social and not financial because huge revenue by sale of grass was lost. Also higher costs were needed for the STP and its O&M.
2	Retrieving the surrounding real estate	It was agreed that once the sewage farm is taken out, the value of real estate will go up and the local body will realize more income from development charges for new layouts. But the time frame by which this will happen cannot be foreseen.

No.	Social Issues	Relevance to the Social Cost Benefit Issues
3	Health of the population near the grass farms	Once the grass farms are removed, the propagation of insect vectors spreading from the farms could be practically eliminated. The impact can be quantified into man days that could be saved from people falling sick and instead earning their livelihood. But the problem is there is no organized information on how many man-days were lost,seasonal variation etc.
4	Improvement of final marine coastal outfall zone	Once the mechanized STPs are provided, the final discharged sewage will not be raw sewage. It will be treated sewage with almost 99.9 % of water borne pathogenic organisms having been inactivated. This in turn will stop the ground water in the discharge location getting polluted by these pathogenic organisms. But the problem is there is no organized information of pathogen occurrence in the ground water in this zone.
5	Sale value of treated sewage	Once sewage is treated to secondary standards, it gains a quality which can be used by industries for non-human contact cooling purposes. Its cost can be just a token value as compared to commercial tariff for fresh water; Moreover, it will be a mistake to waste freshwater for such purposes. Thus, there is a social benefit. But then, putting a monetary benefit to this is not possible especially by way of time related development as there may be many factors such as willingness of the industries nearby, the validation of the technology and the completion period for its implementation. This is a case where the social benefit can be readily agreed to, but the benefit cannot be readily quantified.

Source: UNEP, 1985

Actually, if the benefit is only 0.28, the benefit cost ratio becomes 0.28 and that project would not have been sanctioned at all. But then, there is no denying the fact this city is one among the top few now to have almost 100% sewerage and gas generation and utilization for in-house electricity generation by now in all its STPs. However, we should not stop sewerage and STPs.

The real problem in doing a benefit-cost analysis of sewerage is the fact that there are no reliable models for quantifying health benefits. This is because information on vital statistics is not up-to-date and information is missing in many places. Thus, it is strongly felt that the social value of sewerage can be easily understood and does not need a benefit-cost ratio.

It is to be thus seen that the value of sewerage as a socially benefitting occurrence has to be considered and does not require carrying out social cost-benefit appraisal. If carried out, this will be full of guesswork and finally the real occurrence may be totally different. The fact that the sewerage and STP are also removed from the list of projects requiring EIA reinforces this. Thus social cost-benefit analysis should be scraped from project proposals for sewerage and instead reliance be placed on technical and economic appraisal.

4.6 FINANCIAL PROBLEMS OF ULBs AND RELATED ISSUES

The financial problems of ULBs are directly traceable to the straightforward issues as listed below:

a. Initiatives are absent in many ULBs because there are no incentives for achievement.
b. ULBs do not take efforts to boost revenues as levies are more a political affair.
c. Institutional capacity for forward financial planning is mostly historical.
d. Public think that water is a product of nature and should be supplied free of cost.
e. Public think sewerage is also an obligation by the ULB and is included within the taxes they pay.
f. However, the taxes are not sufficient for the upkeep of the ULB commitments.
g. User charges are not fixed realistically for the services rendered.
h. ULB revenue expenditure does not provide for depreciation and financial charges.
i. The State Government controls the local body to revise their tariff and taxes.
j. The ULBs are always on the lookout for grants from Government.
k. If the grants dry up, most ULBs will be in the “lockout” stage.
l. The ULBs are also taking it for granted that loans will be closed as grants, sometime.
m. Double entry system of bookkeeping is not in vogue.
n. Cost accounting is simply ignored in most of the ULBs.
o. Budgeting is a mere annual ritual than a professional exercise in forward planning.
p. Cost control measures are not attempted due to lack of cost consciousness.
q. Energy audit, maintenance audit, system audit, asset management etc., are not carried out.

These are practically the positions in most ULBs, except where there are high profile, industrial clusters and the revenues are consistently high for the ULBs. These cannot be however allowed to escalate. The following realities are to be recognized and fresh initiatives taken.

a. Historically, funding of sewerage projects were entirely out of grant funding from GOI and allocation of budget money by state Governments.

b. As both these sources in turn depend on taxes and charges in various sectors, the funding could never be met fully and projects were dragging on towards instalments.

c. Local bodies are not able to take up sewerage projects on their own because the per capita costs of sewerage projects are not affordable for the public. The main reason for this is that the underground sewerage collection system costs as much as 70% of the sewerage costs. In addition, the long project completion periods running into more than 5 years sometimes due to problems of land acquisition, traffic diversions, narrow roads in old cities etc., add to the inconveniences faced by the public.

d. The concept of incremental sewerage, permits many options towards deferred completion of sewerage projects in various segments within a given local body and examples like twin drains in newly developing areas, on-site systems backed up by sullage management by the local body are to be taken on board.

e. It is necessary to have public consultation on the likely costs to be paid by the public under various types of sewerage and build in their choices in project formulation.

f. The requirement of technical appraisal and financial appraisal could be made with reasonable precision in sewerage project proposals. However, quantifying the social cost benefits can be misleading and it will be enough if the benefits are described in the project proposal.

g. The use of land owned by the local body for generation of funds and approving a master plan in outlying areas to enable the growth of real estate, permitting increased FSI in main corridors of transport are to be exploited to generate revenue.

h. Once the proposals are firmed up, the technical and financial appraisals should be carried out to justify the extent of funds sought for the projects.

i. However, the so-called social appraisal or cost-benefit appraisals should be scrapped altogether in respect of sewerage schemes, because a sewerage scheme is on any day an environment enhancement measure and the benefits of health cannot be quantified. The example of the Chennai city STPs cost-benefit study of 1980s and how that has now proved a misconception at this point in time after three decades should be an eye opener in this respect.

j. The PCB's insisting on EIA for STPs even after the contract has been awarded is to be set aside especially as in most cases, locations for STPs are either graveyards or cemeteries or solid waste dumping yards and if EIA is insisted upon, there will be no place to build STPs.

k. Once appraisals are completed, shortfalls in financial closure can be made up by floating municipal bonds underwritten by state Governments.

l. Implementation sequence should be wisely chosen to commission various sections of the local body in stages and generating revenues from completed portions instead of waiting for the entire project to be completed, especially the collection system.

4.7 SUMMARY

The present inability of the ULB's to enhance the levels of service is invariably related to the revenues falling short of the ideal expenditures needed to be made. The public expects the improvements to be demonstrated before they come forward to pay the increased levies. The ULB's however, will need the increased levies to be complied with by the public for the ULB's to embark upon and demonstrate the enhanced services.

This is a perpetual cycle going on.

A possible resolution will be for each ULB to seek a "proving grant in aid" funding from the government and embark on a pilot scale and then go to the public for their willingness to pay the increased levies for enlarging the pilot facility. However, the capital cost thereof may have to be invested up front by the Government as a soft loan for the ULB's and the ULB's making good the soft loan back to the Government by repaying from the revenues of increased levies. This approach alone holds the key for enhancement of the services.