

FINAL REPORT



ADB



Asian Development Bank
National Capital Region Planning Board

Capacity Development of the
National Capital Region Planning Board
Package 2 Component B
TA No. 7055-IND

Volume I-F : Economic Financial Analysis

**Detailed Project Report for
Water Supply System in Panipat**



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ASSOCIATES

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NCR Planning Board
Asian Development Bank

Capacity Development of the National Capital Region Planning Board (NCRPB) – Component B (TA No. 7055-IND)

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Volume I-F: Detailed Project Report for Panipat Water Supply –
Economic & Financial Analysis

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Abbreviations

ADB	:	Asian Development Bank
BOQ	:	Bill of Quantity
CAA	:	Constitutional Amendment Act
CAGR	:	Compound Annual Growth Rate
CDP	:	city development plan
CF	:	Conversion Factor
CNCR	:	Central National Capital Region
CPHEEO	:	Central Public Health and Environmental Engineering Organization
DSC	:	Design Supervision Consultant
EA,	:	Executing Agency
EIRR	:	economic internal rate of return
ENPV	:	economic net present value
EOCC	:	Economic Opportunity Cost of Capital
FY	:	Financial Year
FYP	:	Five Year Plan
GoI	:	Government of India
GoUP	:	Government of Uttar Pradesh
HHs	:	Households
HN	:	Hapur Nagar Palika
HPDA	:	Hapur Palkhua Development Authority
HUDCO	:	Housing and Urban Development Corporation
IA	:	Implementing Agency Agency
IEC	:	Information, Education & Communication activities
JNNURM	:	Jawaharlal Nehru Urban Renewal Mission
LA	:	Land Acquisition
LPCD	:	Litres Per Capita per Day
MDG	:	Millennium Development Goals
NCR	:	National Capital Region
NCRPB,	:	National Capital Region Planning Board
NCT	:	National Capital Territory
NH	:	National Highway
O&M	:	Operation and Maintenance
OR	:	operating ratio
PDA	:	Patiala Urban Planning & Development Authority
PIU	:	Project Implementation Unit
Rs.	:	Indian Rupee
SCF	:	Standard Conversion Factor
SFC	:	State Finance Commission
SWM	:	Solid Waste Management
TPI	:	Third Party Inspection
UGD	:	Under Ground Drainage
ULB	:	urban local bodies
UP	:	Uttar Pradesh

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1. ECONOMIC ANALYSIS

A. Review of macroeconomic context.

1. City / Town Profile

1. The existing town of Panipat is situated on National Highway No.1 (Delhi-Amritsar, G.T. Road) and is at a distance of about 85 kilometres from Delhi, 34 kilometres from Karnal. The town is headquarter of Panipat district. The town is the point of convergence of roads from Delhi, Gohana, Karnal, and Assandh, in Haryana and Kairana from Uttar Pradesh. It is also a Railway Junction. The Delhi- Ambala Railway line, which runs parallel to the G.T. Road, divides the city into two parts. On the western side, across the Railway line is the Industrial area and the Model Town. The old town of Panipat lies on the eastern side. The three sides of Panipat district touch other districts of Haryana - Karnal in the north, Jind in the west and Sonipat in the south. Panipat borders Uttar Pradesh across Yamuna in the east. The character of the old town has remained much the same over time. However, the planned sectors developed by Haryana Urban Development Authority (HUDA) have grown and gained importance. The HUDA areas have grown substantially and now represent almost 26 percent of the overall urban population.
2. The population of Panipat Town as per census 2001 was 261740. Panipat Municipality was established in 1986. At present, the municipal area of Panipat is 2000 ha (20sq. km).
3. *Major Economic Activity.* Panipat is an important commercial centre. It is an important town in NCR area, which is being developed to decongest National Capital Delhi by improving infrastructure in NCR towns with the aim of shifting some of the offices and establishments of Government of India. It is a big mandi of Grains. Panipat is popularly known as 'THE CITY OF HANDLOOM' because the industrial activities in this town primarily consist of textiles with handloom. It is the biggest centre for quality blankets and carpets in India and has a handloom weaving industry. Panipat also has heavy industries, with a refinery of the Indian Oil Corporation, a Thermal Power Plant of National Thermal Power Corporation and a Fertiliser Plant of National Fertilizers Limited.
49. The main occupation of inhabitants is agriculture and agro based trade and manufacture of textiles, carpets and Pachranga Achar and their trading. Therefore, the people, are generally well to do. The importance of this town is steadily increasing. There are mostly double storied houses also in the town apart from single storied pucca houses. Areas developed by HUDA (Haryana Urban Development Authority) are well planned and has very good houses and shopping areas and complexes.
4. *Its importance in the NCR.* It is an important town in NCR area, which is being developed to decongest National Capital Delhi by improving infrastructure in NCR towns with the aim of shifting some of the offices and establishments of Government of India. With all the required facilities and proximity to Delhi , Panipat has become one of the fast

developing town in NCR.

5. The Haryana Urban Development Authority (HUDA) has acquired approximately 1230 hectares of land for development of residential and industrial areas. The development works are under progress. A well-planned Transport Nagar on G.T. Road is a redeeming feature, which has eased the parking congestion in the town to some extent and will provide the facilities at one place once all workshops of the town are shifted to the Transport Nagar. The living environment of the town is likely to improve considerably after the development of industrial sector-29 Part II, as it has the capacity to accommodate all the fibre-dyeing units scattered presently in and around the town including its residential areas.

2. *Economic Policy*

6. *Implication on Town's growth.* Good water supply service calls for three important benchmarks, viz: a) 'Sufficient Quantity & continuous supply,' b) 'Adequate Water Pressure' and c) 'Potable, Aesthetically Satisfying Water Quality'. Because the state is moderately endowed with water resources and there appear to be more constraints on utilising these resources for water supply. The Millennium Development Goals (MDGs) (Goal No.7) enjoin upon the signatory nations requiring them "to halving the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015" and 100 percent access by 2025. This implies extending coverage to households which are presently without improved sanitation, and providing proper sanitation facilities in public places to make cities open-defecation free
7. *National Urban Sanitation Policy.* National Water Policy approved by the Government of India in April 2002 recommended the following:
Adequate safe drinking water facilities should be provided to the entire population both in urban and in rural areas. Irrigation and multipurpose projects should invariably include a drinking water component, wherever there is no alternative source of drinking water. Drinking water needs of human beings and animals should be the first charge on any available water.
8. Subsequent national programs like Rajiv Gandhi Rural Drinking Water Mission, Jawaharlal Nehru National Urban Renewal Mission (JNNURM) etc are focusing to improve the water supply situations in rural and urban areas to achieve the goals set in the National Water Policy. The vision of the policy is that all Indian cities and towns become totally sanitized, healthy and livable and ensure and sustain good water supply for all their citizens with a special focus on hygienic and affordable water supply for the urban poor and women.
9. Haryana has 100 percent coverage urban water supply schemes. However, the main problems comprise of intermittent water supply resulting in in-adequate terminal pressures, contamination in distribution network, high amount of UFW and poor customer care. Also unplanned use of ground water sources is resulting in many environmental issues.

10. Eleventh Five Year Plan of GoI with the support of states including Haryana have identified action program to achieve 100 per cent population coverage for better water supply in urban areas.
11. The NCR Regional Plan 2021 defined Central NCR (CNCR) and area of NCR except CNCR i.e. outside CNCR and proposed 7 metro centres and 11 regional centres. Panipat has been proposed as a regional centre outside CNCR . Since Panipat is to be seen as a regional centre for Haryana sub-region of National Capital Region, therefore, there is a need to intensify the development efforts by providing sufficient regional level infrastructural facilities so that it may not only hold back the out-migration but also capture the Delhi-bound migration. Efforts for the same have already been started with the help of public-sector development agencies.
12. In order to channelise the development in planned manner and to control the sprawling haphazard piecemeal growth, the state government declared 6740 hectares area around municipal limits of the town in year 1971 as controlled area and 22800 hectares area as additional controlled areas– II and III in the year 1982 under section 4 (I) (a) of the Punjab Scheduled Roads and Controlled areas Restriction of Unregulated Development Act-1963 (Punjab Act 41 of 1963), vide Notification No. 10165-VDP-71/3884, dated the 10th September, 1971 and 10 DP-82/3163, dated the 23rd February 1982 published in the Haryana Government Gazette dated the 24th January 1984 vide Notification No.3591-2TCP/83 dated the 26th October 1983.HUDA is developing residential sectors in this controlled and additional controlled areas which will attract more related activities and will fasten the town growth.
13. Landuse use pattern for residential purpose had increased to 43% in 2021 Panipat Development Plan. This will increase the residential density in the town in coming years.
14. Four / six laning of the NH1 connecting Delhi and Amirstar had attracted major educational, institutional, tourism and industrial activities. These together will have more pressure on Panipat Town and subsequently for urban civic infrastructure including water supply and sewer.

B. Review of Sector Context.

1. Present Status

15. Despite the increasing importance of the town in the economic growth of the national capital region, the urban infrastructure is not adequate.
16. The water supply system of Panipat is facing several problems at present. A low level of service in terms of low per capita water supply rate, short hours of supply, insufficient terminal pressure in the outlying areas, and non-uniform spatial supply rate are among these problems. Most of the unauthorized colonies do not receive municipal water supply. These problems affect the water consumption patterns in the following ways:

- Those colonies not receiving municipal water supply use ground water extensively to meet drinking and non-drinking needs of water.
 - Areas connected to the municipal water supply system but located at the tail of service area, use ground water to supplement the municipal supply due to low rate of supply and low terminal pressure.
 - Small household industries and commercial enterprises (dying, dairies, hotels, nursing homes, and hospitals) continue to rely heavily on ground water to meet their demands.
17. Therefore, the inadequacy in provision of water supply is likely to be the major constraint to the potential economic growth in the National Capital Region. Reduction of disparities through targeting less developed areas was a core element of the Government of India's 10th Five Year Plan (2002-2007). The objective of the 11th Five Year Plan is 'faster and more inclusive growth,' citing the issues on inequitable share of growth, which was seen as increasing disparities among states, and regions within states, between urban and rural areas, and between various sections of the community. In order to realize the Five Year Plans, investment into sewerage sector in Panipat town is necessary.

C. Justification for Government Intervention to Sector.

18. The basic urban services include water supply, sewerage, drainage and solid waste management (SWM). All of them are the mandatory functions of urban local bodies (ULB) under the 74th Constitutional Amendment Act (CAA). Unfortunately, immediate transfer of functions from the states to ULB is highly impractical due to the inadequate technical and financial strength of the ULB. Consequently, many of the state governments take initiative on capital investment and operation of water supply and sewerage while delegating SWM to ULB, which require less technical and financial strength than water supply and sewerage. In some states, the state governments take initiative on capital investment on water supply and sewerage projects. On completion of the construction they will be maintained by themselves like in Haryana State and also handed over to the ULBs for operation and maintenance in some states, similar to UP . In UP, generally Haryana PWD(WSSD) will develop the sewage project and maintain themselves and this will be applicable to the Panipat Water Supply scheme also.
19. In addition to being a constitutional obligation, provision of these services has economic rationales for government intervention for the following reasons: (i) many of the services (especially wastewater treatment, drainage and solid waste management) are natural monopolies unsuited to unregulated private investment, and hence justify government intervention at least in regulation; (ii) environmental sanitation improvement (a) protects a public good such as a hygienic environment, and (b) prevents a negative situation arising from pollution; and (iii) poverty alleviation programs minimize the inefficiency in economic growth in the urban areas. The economic rationale for government intervention is therefore sound.

D. Demand Analysis.

20. Proposed water supply DPR in Panipat is planned for eighteen zones covering full municipal area and the developed HUDA Sectors in the controlled area and 0.71 million projected population (2041) as Phase I of the Mater Plan requirements as shown in **Table 1.1**. Design parameters considered to serve the coverage are listed below.

Table 1-1: Details of Design Coverage

Zone no.	Population			Water Demand (mld)		
	2011	2026	2041	2011	2026	2041
1	17000	25532	38360	2.72	4.09	6.14
2	17635	25135	35814	2.82	4.02	5.73
3	16679	22673	30884	2.67	3.63	4.94
4	17247	20414	24163	2.76	3.27	3.87
5	24059	27290	31046	3.85	4.37	4.97
6	11585	22089	32316	1.85	3.53	5.17
7	26570	36608	57853	4.25	5.86	9.26
8	13876	19777	28189	2.22	3.16	4.51
9	31361	33609	36309	5.02	5.38	5.81
10	35560	37482	39539	5.69	6.00	6.33
11	19113	23091	27764	3.06	3.69	4.44
12	20452	25927	34847	3.27	4.15	5.58
13	22039	26417	32550	3.53	4.23	5.21
14	17190	28624	54461	2.75	4.58	8.71
15	15847	35750	64084	2.54	5.72	10.25
16	21050	26717	43048	3.37	4.27	6.89
17	29043	31670	53007	4.65	5.07	8.48
18	12877	30349	46480	2.06	4.86	7.44
Total	369183	499154	710714	59.07	79.86	113.71

- Looking to the recommendations of CPHEEO and the provisions of Regional Plan 2021, it is assumed that water supply at consumer end will be 135 lpcd with UFW as 15%. Thus water supply shall be designed for a gross supply of 160 lpcd. Water requirement of major industries, commercial establishments and institutions with bulk requirement will be met by themselves.
- Continuous 24 hours water supply shall be provided with a minimum terminal pressure of 12m as buildings are mostly single story and 2 storied.
- The design period adopted for the Water Supply system is 30 years. Based on the recommendations in the CPHEEO Manual on water supply, following design periods have been adopted:

(i) Water Treatment Plant	15 years
(ii) Canal Outlet	30 years
(iii) Raw and Clear Water main pipe lines	30 years
(iv) Distribution system	30 years
(v) Clear water ground/over-head tanks	15 years

(vi) Pump house buildings	30 years
(vii) Pumping equipment (E&M)	15 years

- A turn-key approach is considered for the construction of Raw Water Pumping Station (RWPS), WTP, Clear Water Pumping Station (CWPS), Pumping main pipe line and OHSRs. Under this approach the performance requirements and suggested layout are specified. The contractor finalises the layout and carries out the complete design and construction, supply, testing and installation including all associated civil works and mechanical and electrical works

1. *Water Supply situation in Panipat*

21. There are two water and wastewater service providers in Panipat town for non-industrial users. These are the Public Works Department (Water Supply and Sanitation department) (PWD-WSSD) and the Haryana Urban Development Authority (HUDA). These agencies provide all the basic services pertaining to water supply and sewerage facilities in Panipat town. PWD-WSSD is a state government department and is primarily responsible for providing water supply and sewerage services within the municipal boundaries. Their responsibilities include providing piped water supply and sewerage facilities to the residents of the area.
22. The PWD-WSSD has informed approximately 27,303 water connections in their service area. There are smaller but undetermined number of unauthorized connections. Using an average of six persons per connection, the population officially connected to the water supply system is approximately 163,818. The population in the PWDWSSD service area was documented at 282,714 in 2006. This implies that 58 percent of the population is connected legally to the water supply system. However, a number of consumers located on the outskirts of the PWD-WSSD service area have been reported to be using personal hand pumps as their main source because of low residual pressure in distribution system at those locations. Due to an unequal distribution of water, per capita water supply in some areas could be less as compared to the targeted per capita rate
23. HUDA is the second largest service provider in Panipat and is responsible for providing services only to areas developed by it. The areas under HUDA are divided into “Sectors”. HUDA has separate water works and a wastewater collection system. However, wastewater from HUDA areas is currently being discharged into PWD-WSSD sewers and treated at the existing 35 MLD Sewage Treatment Plant (STP) in Panipat. HUDA has released about 4818 water connections in the HUDA service area.
24. The total estimated quantity of water delivered to the distribution system of PWD-WSSD and HUDA by a total of 195 tube well based supply is 81.05 MLD. A leakage factor of 40% has also been applied to the total quantity of water delivered into the distribution system. Thus, the total estimated quantity of water used by consumers is 48.63 MLD. This gives a service level of around 100 lpcd for the present estimated population of 4.86 lacs. Industries are estimated to be using 40MLD water from their own bore wells to meet their requirement.

25. The Socio-Economic Survey analysis for Panipat (2008) had revealed that there is a shortage of water in dry season and water collection from (i) ground water and (ii) ground water from other houses were the two major sources of during the period of shortage. The source of water during the shortage, ground water as source ranked the highest. Within the ground water category for non-slum and slum, tube well with in the community is the major source of water. Water vending is not a commonly practiced phenomenon as it is depicted from the survey results.
26. Proposed water supply project in Panipat Town is aimed to increase the supply level of 100 lpcd and 58% coverage in 2009 to 135 lpcd and 100% coverage by the year 2041. This amounts to 161% increase in the water supply level by 2041 and this indicates the increased demand level for water supply system for Panipat Town.

Table 1-2: Per Capita Consumption Forecast – Panipat water Supply

City/Town	Current Consumption	Supplied by Piped Water*	Target Year Consumption	Supplied by piped water in Target Year (2041)
Panipat Town	100 lpcd	100 lpcd	2041	135 lpcd

*- Only 58% of the population in Panipat only covered under the piped water supply.

Table 1-3: Consumer Projection – Panipat water Supply

City/Town	Current Population	Current Coverage	Target Year Population (2041)	Target Coverage	% Increase
Panipat Town	469,933	58%	710,714	100%	161%

2. *Effective Demand for Water Supply: and sewerage*

27. The socio-economic baseline survey ¹ was aimed at understanding the perception of the public towards the existing urban civic infrastructure and their service levels including their opinion towards the improvement of these services and their willingness to pay for assessing the ‘effective demand’. Though this survey had covered the ‘willingness to pay’ aspect, it was not given specific focus so as to amend the results to statistical framework.
28. The Base line Survey results had indicated that 63 percent of slum households (HHs) and 47 percent HHs in the non-slum category are willing to avail the new connections if available and most of these HHs were not presently covered by the water supply (WS). Though 100% of the HHs that are willing to avail the service are willing to pay the user charges for the new household level connections, 88% of non-slum HHs and 100% of slum HHs were opinioned to pay less than Rs 150 per month. Present monthly charge for domestic connection is Rs 25. Also, in general, HHs were found with willing to pay the

¹ conducted as part of the present project (2008) in Panipat Town (with 0.5% sample size with stratified sampling approach giving representation to all administrative wards and all notified slums)

increased user charges with additional 20% to the existing one, for the increased service levels.

E. Identification of project rationale.

29. The present water supply system covers only part of the town area and is with more deficiencies in service delivery. Also the Water Supply Master Plan (WSMP) prepared for the town has identified deficiencies and formulated recommendations to be implemented in phased manner that include (i) increased water supply as per the CPHEEO norms; (ii) 100 percent coverage; (iii) shifting the water source from ground water to canal water and (iv) ensuring 24 hours water supply.. Thus the main project rationale lies for the rehabilitation of the water supply system for Panipat Town in filling the demand – supply gap resulted from

- Lack of coverage and
- Inefficient functioning of the existing system

F. Identification of Project Alternatives.

30. Alternative designs were assessed on three aspects, namely, cost-effectiveness, operation and maintenance capacity of the states governments and ULB, and safety to beneficiaries. The proposed design of the project incorporates that (i) service coverage are limited to municipal area and the higher density sectors developed by HUDA, (ii) selected optimum network with least cost options including size and material for pipes (iii) decision on rehabilitation of the existing system (iv) selection of WTP locations (v) selected optimum technology for WTP operation (vi) selected technologies meet geographical restrictions and can be operated and maintained by the asset owners with minor training, and (vii) materials and equipments are locally available and incur least cost during construction and maintenance, but are internationally accepted as health hazard free. These Assessments are discussed in the design section of this DPR.

G. Identification and Comparison of Project Costs and Benefits.

1. Economic Cost:

31. From the cost estimate discussed in Section of this report, the ‘base’ project financial cost is estimated to Rs. 1613.15 million. Considering the contingency and allowances of additional 12% (Physical contingency (3%), DSC+Third Party Inspection (TPI) - 3%, IEC activities 1%, o Incremental Administration (PIU) – 2%, Environmental mitigation 1%, Social intervention 1%, and Institutional development and capacity building activities1%), the total project financial cost was worked out to Rs 1790.6 million and this is phased during the three year construction period as follows:

- 2010-11 – 10%
- 2011-12 – 50%
- 2012-13 – 40%

32. Considering the standard procedures recommended for economic feasibility analysis, the above financial cost was converted into economic cost for the analysis. Details of economic cost analysis are presented in **Appendix 1.1.**

2. *Project Benefits:*

33. The present water supply system covers only part of the town area and is with more deficiencies in service delivery. Also the Water Supply Master Plan (WSMP) prepared for the town has identified deficiencies and formulated recommendations to be implemented in phased manner that include (i) increased water supply as per the CPHEEO norms; (ii) 100 percent coverage; (iii) shifting the water source from ground water to canal water and (iv) ensuring 24 hours water supply.. Thus the main project rationale lies for the rehabilitation of the water supply system for Panipat Town in filling the demand – supply gap resulted from

- Lack of coverage and
- Inefficient functioning of the existing system

34. The economic benefits considered in the present analysis for the water supply component in Panipat Town include:

- Resource Cost Savings
- Water Collection Avoidance Costs
- Health Benefits
- Opportunity Cost for Diverted Water (negative benefit)

Details of economic benefits are presented in **Appendix 1-II.**

35. *Exclusions.* The following benefits of water supply project have not been quantified for want of adequate data and quantification techniques. These qualitative benefits along with the quantifiable benefits discussed above, the proposed water supply system will tend to provide better living condition in the project town.

- (i) Public cost of treating water borne diseases due to poor environmental sanitation;
- (ii) Effects on businesses and industries, such as aquaculture and fisheries, agriculture and washing; and
- (iii) Effects on tourism and tourist-related businesses.

H. Economic Feasibility Analysis

1. Analysis Period

36. The analysis period of the project is taken as 24 years from the base year 2009-10 for different sections of the project road as follows:

- Base Year 2009-10
- Construction period – 2010-11 to 2012-13

- Project opened start year – 2013-14
- End of the analysis period –2032-33

No. of operating years after project improvement, considered for economic analysis – 20 years. Thus, 20 years of operation, in effect, from the operation start of the proposed project i.e. 2013-14, has been considered for economic evaluation for the project road.

2. *Economic Feasibility criteria:*

37. The cost – benefit analysis is carried out by using the discounted cash flow (DCF) technique to obtain the economic internal rate of return (EIRR) and economic net present value (ENPV) for the proposed investments and the likely quantified project benefits linked with the project during the defined project analysis period

3. *Economic Opportunity Cost of Capital (EOCC).*

38. Given the complexity of estimating country-specific economic opportunity cost of capital (EOCC), a discount rate of 12% in constant economic prices is generally used as a proxy for EOCC in the economic analysis of ADB-financed projects. The EIRR must be compared with the economic opportunity cost of capital, for interpretation purpose of project feasibility. Results of the analysis are presented in **Error! Reference source not found.**

Table 1-4: Economic Cost-Benefit Analysis for Water Supply Component, Panipat Town

Details	Present Value
	(Rs. million) a/
Costs	
Capital costs	
Water Supply	1313
O&M costs	
Water Supply	287
Total costs	1600
Benefits	
Total Resource Cost Benefits	4029
-time savings	688
Avoided costs of	
-health care & earning lost due to illness	560
Opportunity cost due to diversion of water from agri. Use	-182
Total benefits	5095
Economic Return Measures	
Net present value (Rs. Million)	3495
EIRR (%)	37.45

a/ In 2009-10 prices. Discounted to 2009-10 at 12% real discount rate.

Source: Consultant

I. Sensitivity Analysis

39. Sensitivity analysis was carried out to their economic feasibility results for the following scenarios:
- Capital cost increase by 20%
 - O&M costs increased by 20%
 - Target beneficiaries reduced by 20%
 - Delay in accrual of benefit by 1 year
 - Combined adverse condition
40. Results of the sensitivity analysis for the proposed project are summarized below in **Error! Reference source not found..** Detailed calculations are given in **Appendix 1-III.**

Table 1-5: Sensitivity Analysis for Water Supply Component (EIRR)

Details	EIRR	Switching Value c/
Main Evaluation (Base Case) a/	37.45%	
Capital Cost Overrun b/	32.52%	255.00%
O&M Cost Overrun d/	37.07%	1167.00%
Decrease in Project Benefits e/	30.57%	63.00%
One Year Delay in Implementation	37.43%	
All Four Tests Combined	26.43%	

a/ From **Error! Reference source not found..**

b/ 20% increase in capital cost estimates.

c/ Calculated as the percentage change in a variable required for EIRR to reduce to 12%. For example the capital cost can increase by 63% or project benefits can reduce by 33% to get the minimum required level of EIRR of 12%

d/ 20% increase in O&M cost.

e/ 20% decrease in project benefits

Source: Consultant

41. Of the four sensitivity scenarios (cost overrun, O&M cost increase, reduced beneficiaries, delay in implementation) reduced beneficiaries is the most vulnerable to EIRR, followed cost overrun. Considering the more sensitiveness of these variables, following implementation arrangements need to be focused more so as minimize the project risk:
- Ensuring adequate project coverage of beneficiaries through advance commitment from HHs for individual connections or making mandatory for all individual connections through project design;
 - Timely implementation of the project through appropriate procurement method in which incentive for early completion may be included;
 - Adequate focus for LA and utility shifting related project components so as to avoid project delay

J. Conclusion

42. The main evaluation has indicated that the proposed water supply sub project for Panipat Town was found to be economically viable, with the calculated EIRR values exceeding the economic opportunity cost of capital. The sensitivity analysis has demonstrated the robustness of this result, with the subproject component economically viable even when the combination of changed assumptions was tested.
43. Furthermore, for the proposed water supply subproject, the calculated EIRR value is considered minimum estimates of economic return, as there are a number of economic benefits of reduced water pollution related issues, improvement in sanitation, tourism benefits and a cleaner city that have not been quantified.

2. FINANCIAL MANAGEMENT AND ANALYSIS OF PROJECTS

A. Introduction

44. Financial analysis for subprojects generally consists of both (i) Financial Management Assessment and (ii) Financial Analysis and this is the specific requirements for the financial analysis to the projects funded by ADB. The minimum requirement for Financial Management Assessment and analysis, are described in ADB's 'Financial Management and Analysis of Projects (the Guidelines)'.
45. Financial Management Assessment, the first part of analysis, concentrates on the assessment review of Executing Agency (EA) and Implementing Agency (IA) with respect to the subproject subjected to financial analysis. Assessment review will cover the areas like financing policies; accounting policies; project implementation plan; financing plan; disbursement procedures and fund-flow mechanisms and regulatory provisions.
46. Second part of the analysis is the 'Financial Analysis' for subprojects. This will mainly focus on the review of EA, IA and the proposed subproject with respect to the following components:
 - past and present financial condition
 - Cost Recovery and Profitability
 - Financial Improvement Action Plan
 - Affordability Analysis
 - Projected Financial Forecasts
 - Cost benefit analysis
 - Sensitivity Analysis
47. The proposed subproject of Water Supply in Panipat Municipality is likely to be funded from ADB fund through NCRPB. Hence for the present analysis, it is considered that the proposed subproject will be funded by NCRPB to the end-borrower (PHED, Haryana). Accordingly PHED with the guarantee of the Haryana State will become both the Executing Agency (EA) as it will have the direct control of NCRPB Loan and the Implementing Agency (IA) as PHED is the asset owner and responsible for the implementation and operation of the proposed subproject, utilizing the loan proceed. Accordingly, is considered PHED both as EA and IA for financial management assessment purpose.
48. Considering the focus of the present assignment 'to support the project preparation efforts of the implementing agencies by preparing demonstration feasibility studies and DPRs that include all due diligence documentations required for processing of the project in accordance with the best practices, including the proposed NCRPB's policies and

guidelines', the following two requirements in carrying out the financial analysis emerge:

- the subprojects funded through ADB loan; and
- the subprojects funded through NCRPB own fund,

In both cases, NCRPB only will be the lender to the end borrowers (ULBs or line departments / agencies) for the subprojects and hence only the end-borrower will be assessed.

49. With this background, the present financial feasibility analysis concentrates more on the project financial analysis as this is the area where the capacity of the IAs needs to be enhanced for both format of loans. Also the financial management assessment part of the analysis is covered to the level of data availability. On finalization of the projects for ADB funding (in which the present subprojects under review may or may not be a part), subsequent consultancies will improve this financial management assessment part of the financial analysis.

B. Financial Management Assessment

1. Policy Context

50. The enactment of the 73rd and 74th constitutional amendments is the historic step in the evolution and development of the Panchayati Raj System and the Urban Local Bodies. The subsequent enactment of the Haryana Panchayati Raj Act, 1994, (Act II of 1994), the Haryana Municipal Amendment Act, 1994 and the Haryana Municipal Corporation Act, 1994 and the formulation of the Haryana Finance Commission Rules were a logical sequel to these constitutional amendments.
51. The ULBs are empowered to impose both obligatory as well as discretionary taxes. The obligatory taxes are those which the ULBs shall impose and it is obligatory on the part of the ULBs to impose these taxes as classified in section 69 of the Municipal Act, 1973. The discretionary taxation measures are recommendatory in nature and ULBs may impose these taxes if deemed fit and circumstances so permit to impose these taxes. These taxes are covered under Section 70 of the Municipal Act, 1973. Section 71 of this Act gives over-riding powers over section 69 and 70 and it authorizes a ULB to levy any tax, toll or fee which the State legislature can impose. Fee with regard to pilgrimages, drainage, lighting, scavenging, cleansing of latrines, providing internal services is coming under the discretionary taxes. In practice, the ULBs are mainly imposing obligatory taxes and few discretionary taxes.
52. Under the Haryana Municipal Act, still a large number of powers are vested in the State Government². To quote a few, the authority for the constitution of committee, deciding its jurisdiction, nomination of councilors, removal of President/Members, constitution of municipal services etc. vest in the State Government.

² Second State Finance Commission Report, Suraj Bhan Kajal, Govt. of Haryana

53. Key features of the decentralization initiative comprised (i) transferring health related institutions (except medical colleges and regional specialty hospitals) to local governments; (ii) transferring all schools to Urban Local Bodies (ULBs); (iii) planning and implementing centrally sponsored poverty alleviation schemes through ULBs; (iv) planning social welfare schemes, implementing Integrated Child Development Scheme (ICDS), payment of various social security pensions, and creating centre for disabled care are ULB responsibilities; (v) planning and providing urban basic services, including water supply, sanitation, storm water drainage and urban roads (excluding those provided / maintained by the State Public Works Department); (vi) Ward Committees in all municipal corporations and municipalities which have a population of three lakhs or more; and (vii) increase of financial power for ULB Heads.
54. *Constitution of State Finance Commission (SFC)*. The system of a smooth sharing of resources between the State Governments and the ULBs on the one hand, and between different municipal bodies on the other, which is one of the objectives of the institution of the SFCs must ensure that the transfer of funds to the municipalities is both adequate and stable. The second round of SFCs are in place in most states and, hopefully, as the system evolves, there will be greater simplicity and transparency in the process of devolution of resources to local bodies, without undue transaction costs.
55. In pursuance of the constitutional provisions, the First State Finance Commission was constituted on 31st May, 1994 covering the period of four years i.e. 1997-2001. The Second State Finance Commission was constituted by the State Government vide notification dated 6th September, 2000 covering the period of 2001-2006 and the Third Finance Commission was constituted in December, 2005 vide notification 2005 No. 18/1/2005-POL (2P).
56. Major recommendations of the 2nd SFC include, apart from the devolution of state taxes, i) full cost recovery for water supply in all the municipalities in the State to be achieved over a period of time by protecting, the interest of the weaker sections of the society; ii) periodical review of user charges, at least every three years, iii) augmentation of municipal revenue through appropriate measures, iv) privatisation of services like street lighting, solid waste management, construction/maintenance of toilets, garbage collection/disposal, street cleaning, maintenance of gardens/parks/play grounds etc, v) . Taxation of Central and State Govt. properties, vi) creation of data base with computerization and supplied to all the stake-holders, vii) better Use of land and other properties of local bodies, training of officials and nonofficials of local bodies has to be a continuous process consisting of foundation courses, refresher courses, re-orientation courses, seminars, workshops, study tours etc. and viii) proper Maintenance of Accounts and their Audit by utilizing the 11th Finance Commission grant provisions.
57. The share of transfers from state governments in the revenues of municipalities was about 30 per cent (2001/02). This is, however, the average; municipalities in several states are almost entirely transfer-dependent for running of local services. The dependence of urban local bodies was as high as 83.71 per cent in case of Jammu & Kashmir, 83.33 in case of

Rajasthan and 74.48 in case of Uttar Pradesh³. This scenario is a result of the following three factors –

- The inferior local taxes which have low elasticity and buoyancy;
- Poor administration of tax and other powers by local governments; and
- Absence of autonomy for local governments in respect of tax rate setting, rate revision and other spheres of their functioning.

58. *Five Year Plans*. Government of India (GoI) in its Tenth Five Year Plan (2002 -2007) emphasized the role of the ULBs:

- To be responsive and accountable to the community;
- to develop cities with standards of service comparable to the best in that particular category;
- to constantly improve their capabilities so as to equip themselves to undertake their tasks in resource-raising, service provision, and poverty alleviation

59. Tenth Plan had focused the reforms in land and housing policy, and of pricing of utilities, should be to augment the resources of the ULBs, provide for adequate maintenance of civic services, and undertake expansion of infrastructure to meet growing needs.

60. Apart from the State Finance Commissions, GoI has found providing support to ULBs through various schemes including AUWSP, IDSMT, JNNURM, Mega City Scheme, NCR PLAN :, HUDCO loan assistance, Tax-Free Bonds scheme and external assistance from multilateral lending agencies like the Asian Development Bank (ADB), World Bank and bilateral agencies.

61. *Govt. of Haryana (GoH)*. Haryana was the first State in the country to provide safe drinking water, power connections and road connectivity to all its villages and towns. This we had done more than fifteen years ago and these facilities now require massive investment for upgradation for maintaining the growth rate of the State's economy. This has been emphasized in the State Eleventh Plan (2007-12) by Haryana State. Over the years, Haryana State is giving more focus for water supply and sanitation sector in term of increased financial outlay for more projects and coverage. Financial outlay for water sector had increased from 8% (Rs.1,297,964 Lakhs) during the Tenth Five Year Plan to 11.93% (Rs.3,500,000 Lakhs) during the Eleventh Five Year Plan as shown below. This indicates the states willingness and preparedness to improve the water supply system in the state including urban areas. In fact, the state is giving more focus on improving the existing water supply level in the urban areas with increased budget outlay and loan funding from National Capital Region. The Budget Speech of the Haryana State Finance Minister while presenting the 2008 -09 budget underlines this. *“All the towns of the State have been provided piped water supply system. To strengthen the existing water supply and sewerage infrastructure in National Capital Region, the NCR Planning Board is*

³ Decentralization and Local Finance Issues - The Workings of State Finance Commissions in India, Dr. Ravikant Joshi

providing loan for the towns falling in NCR and also for counter magnet town Hisar”⁴.

Table 2-1: Sectoral Plan Outlay – Haryana State

Details	Tenth Five Year Olan (2002-2007)		Eleventh Five Year Olan (2007-2012)	Annual Plan		
	Proposed Outlay	Actual Outlay	Proposed Outlay	2006-07 Actual Outlay	2007-08 Revised Outlay	2008-09 Proposed Outlay
1	2	3	4	5	6	7
Water Supply and Sanitation (Public Health)	56,200	110,232	417,500	37,174	63,500	65,300
	4.68%	8.49%	11.93%	8.78%	10.66%	9.82%
Total	1,200,000	1,297,964	3,500,000	423,264	595,766	665,000

Source: Finance Department, Govt. of Haryana, (<http://web1.hry.nic.in/budget2k8/index.html>)

All values are in Rs. Lakhs (10 lakhs = 1 million)

2. National Capital Region Planning Board (NCRPB)

62. The National Capital Region Planning Board (NCRPB), constituted in 1985 under the provisions of NCRPB Act, 1985, is a statutory body functioning under the Ministry of Urban Development, Government of India. NCRPB has a mandate to systematically develop the National Capital Region (NCR) of India which comprises of (i) National Capital Territory Delhi (constitutes 4.4 percent of NCR area); (ii) Haryana Sub-region (40.0 percent of NCR area); (iii) Rajasthan Sub-region (23.3 percent of NCR area); (iv) Uttar Pradesh Sub-region (32.3 percent of NCR area) and (v) Five Counter Magnet Areas (CMA) The project town Ghaziabad City also part of the NCR.
63. According to the NCRPB Act, 1985 major functions of the Board include: (i) Preparation of the Regional Plan and Functional Plans; (ii) Coordinate enforcement and implementation of the Regional Plan, Functional Plans, Sub-regional Plans, and Project Plans through the participating states and NCT; (iii) Ensure proper and systematic programming by the participating states and the NCT in project formulation, determination of priorities in NCR or Sub-regions and phasing of the development of NCR in accordance with the stages indicated in regional plan; and, (v) Arrange and oversee the financing of selected development project in the NCR through Central and State Plan funds and other sources of revenue.
64. NCRPB has prepared regional plan for NCR area with the perspective year 2021. Further, the Board also initiated preparation of functional plans to elaborate one or more elements of the Regional Plan. Accordingly the functional plan for water supply and transport is

⁴ Budget Speech (2008-09) of Sh. Birender Singh, Hon'ble Finance Minister, Haryana. (<http://web1.hry.nic.in/budget2k8/index.html>)

under preparation but plans for other infrastructure is yet to take off (**Appendix 2-1**).

3. *Panipat Municipality (PM)*

65. Panipat enjoys a pride place in the long and chequered history of India. It has witnessed the three famous Battles of Panipat in the years 1526, 1556 and 1761. In 1805, British soldiers captured and took over the town while establishing the cantonment at Karnal. The municipal committee for Panipat was formed in the year 1886.
66. The existing town of Panipat is situated on National Highway No.1 (Delhi-Amritsar GT Road) and is at about 85 km from Delhi, 34 km from Karnal. Panipat is the headquarter of Panipat District in Haryana State. The town is the point of convergence of roads from Delhi, Gohana, Karnal, and Assandh, in Haryana and Kairana from Uttar Pradesh. It is also a Railway Junction; the Delhi- Ambala Railway line, which runs parallel to the G.T. Road, divides it into two parts. On the western side, across the railway line is the Industrial area and the Model Town. The old town of Panipat lies on the eastern side.
67. Panipat is popularly known as ‘the city of handloom’ because the industrial activities in this town primarily consist of textiles with handloom. Textiles produced at Panipat have a very good domestic as well as international market. Internationally known Pachranga Pickle is produced here. The National Fertilizers Limited and Panipat Thermal Power Plant represent the heavy industry segment of Panipat. The scenario will change radically as soon as Indian Oil Refinery at Baholi Village, in close proximity to the town, goes to full production. This prestigious project of national importance is likely to further boost the economy and size of the town.
68. The town has more than 24,000 looms which turn out fabrics, durris and other handloom products for export. Besides, there are an equal number of looms that cater to the domestic market. The turnover of the industry which was Rs 1 crore (1970), shot up to Rs 425 crore in 1996-97. Fifty per cent of the handloom material exported from the country comes from Panipat. Today this sector gives employment to more than 1.5 lakh persons in Panipat. Panipat, the handloom house of India, is also getting polluted due to the presence of both small and big industries in and around the town.
69. It is an important town in NCR area, which is being developed as a regional centre for Haryana sub-region to decongest National Capital Delhi by improving infrastructure in NCR towns with the aim of intensifying the development efforts by providing sufficient regional level infrastructural facilities so that it may not only hold back the outmigration but also capture the Delhi-bound migration. With all the required facilities, Panipat has become one of the fast developing towns in NCR.
70. The municipal limits (old) of the town cover an area of about 1056 hectares. According to the development plan prepared for the town by the state Town Planning Department, estimated population of about 1.75 lacs would be adjusted within old municipal limits. The final development plan provides for the remaining 5.25 lacs(for 2021) to be accommodated in the extended municipal area and controlled area. The town density has been taken as 115 persons per hectare in the final development plan.

4. *Haryana Urban Development Authority (HUDA)*

71. HUDA is an autonomous government body and functions as the land developer in Haryana. HUDA is the second largest service provider in Panipat and is responsible for providing services only to areas developed by it. The areas under HUDA are divided into “Sectors”. HUDA has separate water works and a wastewater collection system. However, wastewater from HUDA areas is currently being discharged into PWD-WSSD sewers and treated at the existing 35 MLD Sewage Treatment Plant (STP) in Panipat. HUDA has released about 4818 water connections in the HUDA service area. Development Plan 2021 proposes 40 sectors in and around existing Panipat town to be developed per designated land use.

5. *Public Health Engineering Department (PHED), Haryana*

72. PHED is a department of Government of Haryana (GoH). PHED is responsible for providing drinking water in both rural and urban districts of Haryana. Excepting for the two corporations of Faridabad and Gurgaon, entire State’s water supply is under the jurisdiction of PHED. As a state line department, PHED is responsible for:

- Drinking water supply facilities in rural as well as in urban areas
- Sewerage facilities in urban areas
- Water supply, sewerage and sanitation in govt. buildings

73. Financial sustainability addresses the required as well as appropriate taxation and tariff reforms. PHED Haryana Revenue Account and sub-project cash flows take cognizance of policy directives undertaken by PHED and HUDA in addressing infrastructure investment and sustenance needs – the focus is on water, sewer/drainage and conservancy charges. While the PHED continues to draw a substantial proportion of its income from government budget support, in the long-term, the strategy of PHED shall be to capitalize on the benefits accruing from budget support. Water supply investments as part of the city development plan (CDP) should recognize the fact that budget support pay for capital investments and user charges pay for system operation and maintenance – given the aforesaid approach, the financial sustainability analysis focuses on reviewing net cash flows arising out of budget allocation and tariff reforms

74. *Accounting policies and procedure:* PHED prepares accounts as per the GoH Finance and Accounts Rules. Separate accounts for projects will have to be maintained. All the project accounts will be incorporated in the final account of PHED. The chart of accounts is adequate to account for all activities of PHED.

75. *Budgeting System:* PHED prepares the budget once in a year according to financial year (April-March following an incremental approach in which the new budget figures are based on previous year’s values plus a 20-30% increase. As a result, PHED does not adopt a results oriented budget approach in which physical and financial targets are defined. Investment activities are planned by the Engineering section in accordance with the PHED Development Plan; however, funding for such activities is provided for by the

Government. Operation and maintenance activities are not planned ahead but they are executed on a need basis.

76. *Accounting Policies:* The basis of accounting is cash. Transition to accrual based accounting system will be possible only if it is adopted at State (GoH) level. Authorized signatories (of cheque payments) are the Drawing and Disbursing Officers of the Divisions of PHED –a) for Works – Executive Engineer b) for Salary – Superintending Engineer and for Head Office – Registrar as delegated by the Engineer in Chief.
77. *Audit System:* Local fund audit section carries out the function of pre-audit in PHED as internal audit. Apart from this there is no internal audit in PHED. This is as per the GoH finance and accounts rules. Action is taken on all audit observations. Statutory audit is done by Accountant General (AG) office. Audit is an ongoing process and compliance actions are taken against audit findings and recommendations.
78. *Report and Monitoring:* Financial Statements are prepared in accordance with Government accounting standards and Indian Accounting Standards (IAS). Three main reports are prepared, annual report (not regularly published), Monthly information system report (MIS) and the statutory Audit Report by external auditors.
79. *Panipat Division:* The review of finances involves a time-series analysis of the income and expenditure of the PHED, Panipat Division of Haryana State to ascertain the trends and the major sources and uses of funds. Revenue assessment and collection performance and O&M expenditure details shown below for Panipat Division of PHED indicate that heavy dependence of budget support for both capital and maintenance works and this need to be corrected.
80. According to figures available for 2007-08, only 34% of the annual O&M expenditure could be assessed for revenue as user charges and only 60% of the assessed revenue could be collected from the users by the PHED Panipat Division that manages the water supply within the municipal limit. During the period 2005 – 2008, the average annual growth for user charges revenue was observed to be 20% while O&M expenditure found to be with 24% annual growth rate. These all indicate that the present system did not give more attention to cost recovery.

Table 2-2: Revenue Assessment and Collection – PHED, Panipat Division

Year	Assessment		Collection	
	Water Supply	Sewerage	Water Supply	Sewerage
	<i>Rs. Million</i>			
2005-06	12.88	0.37	5.79	0.14
2006-07	15.96	0.42	8.32	0.63
2007-08	18.40	0.76	11.03	0.91
2008-09(Up to Oct 2008)	NA	NA	2.05	0.10

Source: PHED, Panipat Division

Table 2-3: O&M Expenditure (2004-2008) – PHED, Panipat Division (Rs. Million)

S. No.	Sub Head	2004-05	2005-06	2006-07	2007-08
1	Daily Wagers pay	0.609	0.096	0.072	0.087
2	Repair & Consumables	3.076	3.007	4.894	9.858
3	Local & other Expenditure	2.252	1.945	3.077	6.792
4	Energy Charges	22.086	32.608	24.505	36.776
	Total	28.023	37.656	32.548	53.513

Source: PHED, Panipat Division

81. *PHED at State Level:* Summarized position of income and expenditure of PHED at state level for a period of five years is given below in Table 3 indicates that its revenue deficit is increasing at a faster rate from Rs 2809 million (FY 2004-05) to Rs 5211 million (FY2008-09) with an observed annual growth rate of 17 percent.

Table 2-4: Financial Performance of PHED (Rs. Million)

Particulars	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	Growth Rate %
Income:						
Water Receipts	309.69	326.64	347.42	379.62	470.70	11%
Sewerage Receipts	14.44	17.44	19.33	15.93	23.00	12%
Total Income	324.13	344.08	366.75	395.56	493.70	11%
Expenditure						
Establishment Expenditure	1653.92	779.28	1916.95	1959.00	2909.20	15%
Operations & Maintenance	1479.16	1856.46	2126.51	3010.89	2795.50	17%
Total Expenditure	3133.08	2635.74	4043.46	4969.89	5704.70	16%
Revenue Surplus / (Deficit)	(2809.0)	(2291.7)	(3676.7)	(4574.3)	(5211.0)	17%

Source: PHED, Haryana

82. PHED follows cash based system of accounting and is yet to switch over to double entry accrual based accounting system. Hence, there is no balance sheet prepared for PHED. GoH is subsidizing the losses of the PHED over the years as there are constraints over revision of tariff rate(s) to meet the cost of operations.

6. Conclusion and Recommendations

83. The budget process and financial management represent important tools to keep track of the financial performance of the organization, to gauge the effectiveness of its management and to identify areas of interventions and reform. In the case of PHED, however, management reports shows that the financial statements produced by the Accounting and Finance Section of PHED are perceived more as a ritual annual presentation of financial information about operating receipts and expenditures, rather than as a tool for efficient allocation of scarce resources. In the absence of accrual based

accounting system, the balance sheet of PHED showing its assets and liabilities is not prepared. Financial statements of PHED fail to provide a true and fair view of the PHED fiscal situation.

84. According to the GoH financial rules, for both the Annual and the Supplementary Budget of PHED, the final approval is given by the Ministry of Finance and the budget is then finalized. The budget process in PHED follows an incremental approach for operation and maintenance. For capital works budget process is led by the definition of strategic targets, both physical and financial, to be achieved by the organization.
85. Over the last few years PHED has not been able to finance its operating expenditures out of own revenues. Capital expenditures are partly financed out of GoH grants, GoI loans and grants and other direct (for e.g. from NCRPB) loans.
86. PHED financial statements are subject to independent audit. According to the GoH rules the audit report should be submitted within six months from the end of the fiscal year, but usually the submission is delayed.
87. Finally, the lack of computerization of the financial management system is another serious impediment to the efficient budget process. Budget data are still recorded in the manual ledger in the accounting and finance department, while at the zonal level information on billing and collection is kept in the consumer ledger which is not reconciled with the general ledger. Financial reports are prepared by spreadsheet which is a lengthy procedure.
88. Urban development and service delivery in Panipat is the combined responsibility of a set of state level and city level institutions. These institutions and their key functions are listed in the Table below segregated in terms of institutions functioning at the state level and city level.

Table 2-5: Institutions and Their Functions

Institution	Key Function
<i>I. State Level</i>	
Haryana Pollution Control Board	Pollution control and monitoring especially river water quality and regulating industries
Public Works Department (PWD)	Construction of roads main roads and transport infrastructure including construction and maintenance of Government houses and Institutions
Dept. of Town and Country Planning, Haryana	regulate the use of land in order to prevent ill-planned and haphazard urbanization in or around towns in the State of Haryana.
Town and Country Planning Department (TCPD)	Preparation of Master Plans including infrastructure for the state (rural and urban)
Public Health Engineering Department	Water supply and sewerage including design of water supply and sewerage networks. In the last two decades 'pollution control of rivers' has become one of their primary focus areas
<i>II. City Level</i>	
Panipat Municipality (PM)	Nodal agency for municipal service delivery and O&M. Its key functions include:

	<ul style="list-style-type: none"> • Primary Collection of Solid Waste • Maintenance of Storm Water Drains • Maintenance of internal roads • Allotment of Trade Licenses under the Prevention of Food Adulteration Act • O&M of internal sewers and community toilets • Management of ghats • Construction of Community Toilets
Haryana Urban Development Authority (HUDA)	Responsible for preparing spatial Master Plans for land use and development of new areas as well as provision of housing and necessary infrastructure
District Urban Development Authority (DUDA)	Implementing agency for plans prepared by SUDA. Responsible for the field work relating to community development – focusing on the development of slum communities, construction of community toilets, assistance in construction of individual household latrines, awareness generation etc.

89. In real sense, 74th Amendment is partially implemented in Haryana. PHED, HUDA, and various other government agencies are functioning in Panipat and are playing different roles of a ULB under different capacities (and other cities of Haryana). This makes the municipality inadequate resulting in limited power and weak municipal administration. These cities / towns are dependent on the state legislature for decisions concerning their regulations and it is critical for the decision making process required at a local level. However, with regard to the issue of reforms, current status and future proposals the state government /ULB are in the process of initiating steps in this direction and the willingness of the governments to undertake the required reforms

7. *Private Sector Participation*

90. The current legal and political climate for the involvement of FI's or Private parties for building urban infrastructure and or operating urban services in Haryana Cities and Towns including Panipat does not look very promising in its present form, as revealed from available CDP Reports. Many reforms, legislative changes and a greater commitment from the local body as well as the GoH are required for attracting private investment and safeguarding investors' interest. However, three broad areas can be identified and explored for private investment for urban infrastructure, namely transportation services, Parking (multilevel parking with commercial space] and Solid Waste Management.

91. In case of water supply, PHED can look into private sector participation in areas like water treatment plant in the form of equity participation through PPP or maintenance contract,

8. *User Charges*

92. There is no metering system for water produced or for water supplied in PHED area. Domestic water connections are all on flat rate basis. Recently metered connections have been started for commercial consumers. The department charges a connection fee of

Rs1,000 for each new connection. The present tariff is Rs.25 per month for single tap connections and Rs.48 per month for two tap connections. The status of water connections in PHED area as on November 1, 2008, was as follows:

- Domestic - unmetered/flat rate (15mm) 27,083
- Commercial - metered (25mm) 220

93. In HUDA area there are reported to be 5,258 domestic, and 591 commercial connections. HUDA gives only metered connections. The present tariff is Rs.4 per KL for domestic plot sizes above 150 sq.yards including all commercial and industrial consumers and Rs.3 per KL for smaller domestic plots.

9. *Financing Plan*

94. Total investment program will be shared between NCRPB and PHED through participating states in such a way that NCRPB share will be 75% and PHED will be the balance 25%. The terms of the loan will of

- 10 years tenure with two years moratorium and eight years repayment period
- 9 percent interest rate

95. As per the existing arrangements, for Haryana state, the entire 70% loan component will be transferred to GNN with the guarantee support of states but without any grant component from NCRPB and hence the total contribution by GNN will be 100% (30% own contribution + 70 % NCRPB loan). For 75% Loan component and 25% own equity component, GNN will be the responsibility. For implementation, GNN will be the Executing Agency for the Investment Program and responsible for overall strategic guidance, technical supervision and work quality and ensuring compliance with loan and PFR provisions and due diligence.

10. *Operation and Maintenance:*

96. In line with the current practice in the Haryana State, PHED in association with HUDA will operate and maintain the improved water supply facilities in Panipat with adequate fund provision and the required technical capability.

11. *Cost Recovery*

97. According to figures available for 2007-08, only 34% of the annual O&M expenditure can be assessed for user charges and only 60% of the assessment could be collected from the users by the PHED Panipat Division that manages the water supply within the municipal limit. This indicates that the present system did not give more attention to cost recovery.

12. *Disbursement Procedures and Fund-Flow Mechanisms*

98. Loan disbursement is a key element in the project cycle. NCRPB expects that proposed disbursement procedures and fund-flow mechanisms will be suitable for the particular project. NCRPB procedures for withdrawal of loan proceeds are standardized to facilitate disbursements under most loans.
99. In the present case, it is assumed that the NCRPB Loan will be passed on, to the PHED with the Haryana State government guarantee. Thus PHED will be the borrower from NCRPB with the Haryana State support. PHED will enter into supply and civil work contracts and issues and signs the payment checks through a suitable arrangement agreed with NCRPB. Created assets will be owned by PHED as water supply will be its responsibility. With regards to repayment of the interest and principle, PHED will pay to NCRPB and this will be governed by the NCRPB's terms and conditions agreeable in the disbursement procedures.

13. *Accounting Policy*

100. Long-, medium- and short-term planning should be the primary elements in financial management. Long- and medium-term plans are often referred to as corporate plans. Short-term financial plans are usually called budgets. NCRPB will seek assurance that satisfactory plans and budgets will be prepared in a regular, orderly and timely manner. Also NCRPB will consider the acceptability of accounting policies, including standards of financial reporting and general accounting practices. NCRPB expects these policies to be materially consistent with accepted national or international standards and practices.
101. Accordingly Public Health Engineering Department (PHED), Haryana that will be involved in the project loan was considered for review. Discussion on PHED's accounting policy is given below.
102. PHED prepares accounts as per the GoH Finance and Accounts Rules. Separate accounts for projects will have to be maintained. All the project accounts will be incorporated in the final account of PHED. The chart of accounts is adequate to account for all activities of PHED. Functional responsibilities appear to be segregated. Separate responsibilities for budget, payment, recording, reporting and audit are assigned to separate groups of officers and staff. The basis of accounting is cash. Transition to accrual based accounting system will be possible only if it is adopted at State (GoH) level.
103. PHED prepares the budget once in a year according to financial year (April-March following an incremental approach in which the new budget figures are based on previous year's values plus a 20-30% increase. As a result, PHED does not adopt a results oriented budget approach in which physical and financial targets are defined. Investment activities are planned by the Engineering section in accordance with the PHED Development Plan; however, funding for such activities is provided for by the Government. Operation and maintenance activities are not planned ahead but they are executed on a need basis.
104. Actual expenditure is compared with budget once in a year in February. PHED also publishes monthly financial reports comparing actual against budget figures and monthly progress reports on project execution which provide information about stage of project

execution. The monthly MIS (Management Information System) Report also includes a comparison of actual financial performance against budget. A revised budget is prepared whenever necessary.

105. Local fund audit section carries out the function of pre-audit in PHED. Apart from this there is no internal audit in PHED. This is as per the GoH finance and accounts rules. Action is taken on all audit observations. Statutory audit is done by Accountant General (AG) office. Audit is an ongoing process and compliance actions are taken against audit findings and recommendations. Financial Statements are prepared in accordance with Government accounting standards and Indian accounting standards (IAS). Three main reports are prepared, annual report (not regularly published), Monthly information system report (MIS) and the statutory Audit Report by external auditors.

14. *Financial Regulations*

106. A sound accounting system is underpinned by financial regulations. These are usually designed to define the objectives of—and responsibilities within—the financial management system. In the interest of the funding agency, an acceptable financial regulations need to be in place.
107. For the present Water supply Subproject, the proposed project will be funded by National Capital Region Planning Board (NCRPB) through loan to PHED, PHED will be both Executing Agency (EA) and implementing agency (IA).
- Financial regulations for NCRPB, as part of the Ministry of Urban Development, Govt. of India, will be governed by the well defined regulatory system designed by Govt. of India.
 - Public Health Engineering Department (PHED), Haryana will be governed by the financial regulation provisions laid by Haryana State under Municipal Act.
 - Both regulation procedures will cover all the required aspects to be considered under financial regulations review, though there may be variations in quality and quantity aspects in between them.

C. Financial Analysis

1. Present Financial Condition

Public Health Engineering Department (PHED).

108. PHED is a department of Government of Haryana (GoH). PHED is responsible for providing drinking water in both rural and urban districts of Haryana. Excepting for the two corporations of Faridabad and Gurgaon, entire State's water supply is under the jurisdiction of PHED. As a state line department, PHED is responsible for:
- Drinking water supply facilities in rural as well as in urban areas
 - Sewerage facilities in urban areas
 - Water supply, sewerage and sanitation in govt. buildings
109. Financial sustainability addresses the required as well as appropriate taxation and tariff reforms. PHED Haryana Revenue Account and sub-project cash flows take cognizance of policy directives undertaken by Panipat Municipal Council, PHED and HUDA in addressing infrastructure investment and sustenance needs – the focus is on property taxation, water, sewer/drainage and conservancy charges. While the PHED continues to draw a substantial proportion of its income from government budget support, in the long-term, the strategy of PHED shall be to capitalize on the benefits accruing from budget support. Water supply investments as part of the city development plan (CDP) should recognize the fact that budget support pay for capital investments and user charges pay for system operation and maintenance – given the aforesaid approach, the financial sustainability analysis focuses on reviewing net cash flows arising out of taxation and tariff reforms
110. PHED as a state department of Haryana state with full budget support cannot be assessed for its financial performance on standalone basis. However, based on the past budgetary performance at division and state level, PHED performance was assessed. Also based on the available data state fiscal performance assessment was attempted, as state government has to support the loan to PHED, as guarantor. Detailed discussion on the financial performance of PHED at state and division levels were discussed above in Section B as well in **Appendix 2- II.**

Haryana State Financial Performance

111. PHED as department is supported by GoH in all financial matters including for the proposed loan from NCRPB. Accordingly, the fiscal performance of the state is also assessed below.

112. The increasing revenue account deficits are subsidized by GoH through budgetary allocations over the years. Haryana is the major borrower of NCRPB funds Also PHED, being a department of GoH, will be looking to GoH support for repayment obligations of loans. . Hence in addition the financial performance of GoH has also been reviewed.
113. The past financials of Haryana state is given in Table 2-6. A snap shot of the past financial position of the state government from 2004-05 to 2008-09 reflects growth in both revenues as well as expenditure. The compounded annual growth rate (CAGR) of revenue income from 2004-05 to 2007-08 is 15.37% and revenue expenditure is 9.86%. Thus the rate of growth of revenue income is more that the growth of revenue expenditure, facilitating reduction in revenue deficits from Rs. 24925.4 Million in the year 2004-05 to Rs. 1219.0 Million in the year 2007-08. However this positive trend was reversed in 2008-09 when revenues were affected by the economic slowdown, whereas revenue expenditure went up dramatically. It is hoped that this is a temporary aberration and the state will revert to its trajectory of fiscal prudence. The CAGR of capital receipts from 2004-05 to 2006-07 is 24.20%. The capital receipt growth is compared only for three years as there is an exceptional negative trend in the year 2007-08. The CAGR for capital expenditure for same three year period is 33.22% (35.38% for four years). It may be observed that the CAGR for capital expenditure is more that the capital receipt, which shows that the state is allocating more resources for plan expenditure.

Table 2-6: Haryana State Financials

		2004-05	2005-06	2006-07	2007-08	2008-09
	<i>All in Rs. Million</i>	Actual				Revised Estimates
I	Revenue Receipts					
1	Tax Revenue	80,600	102,800	122,230	132,520	162,230
2	Non-Tax Revenue	30,900	35,740	57,290	64,990	55,480
	Total Revenue Receipts(a) = (1)+(2)	111,490	138,530	179,520	197,510	217,710
II	Capital Receipts					
3	Recoveries of Loans	1570	2900	22,010	2140	3780
4	Misc.Capital Receipts				100	140
5	Public Debt. (Net)	14,600	22,410	8980	30	34,030
	Total Capital Receipts (b) = (3)+(4)+(5)	16,170	25,310	30,990	2270	37,950
		0	0	0	0	0
	Total Receipts (c) = (a)+(b)	127,660	163,840	210,510	199,770	255,660
III	Revenue Expenditure					
	Non-Plan Expenditure	98,070	107,220	139,990	146,260	176,460
6	On Revenue Account	99,540	106,250	139,080	143,510	172,200
7	Interest Payments	22,350	21,000	22,650	23,460	23,540
	Plan Expenditure					
8	On Revenue Account	14,530	20,150	24,540	31,760	44,950

	Total Revenue Expenditure (d) = (6)+(7)+(8)	136,420	147,400	186,270	198,730	240,700
IV	Capital Expenditure					
	Non-Plan Expenditure					
9	On Capital Account	-1470	970	910	2750	4260
	Plan Expenditure					
10	On Capital Account	12,520	16,920	25,210	34,370	37,300
	Total Capital Expenditure (e) = (9)+(10)	11,050	17,890	26,120	37,120	41,560
	Total Expenditure (f) = (d)+(e)	147,470	165,290	212,400	235,840	282,250
11	Revenue Surplus(+)/Deficit(-) (g) = (a)-(d)	-24,930	-8860	-6750	-1220	-22,990
12	Fiscal Surplus(+)/Deficit(-) (h) = (c)-(5)-(f)	-34,400	-23,860	-10,860	-36,100	-60,630

Source: Haryana state budgets

114. The financial performance of the state governments has also been analysed based on 12th Finance Commission, recommendations and compared with NCR states and the national average. The 12th Finance Commission, as part of restructuring of public finances, has recommended certain measures to improve the long term financial sustainability of Centre and state governments. The suggested indicators suggested by the 12th finance commission include the following:
- The Tax to GDP ratio should be improved to 17.6 % by 2009-10
 - Debt to GDP ratio to be brought down to 75% by 2009-10
 - Fiscal deficit to GDP should be less than 3%
 - There should not be any revenue deficit by 2008-09
 - Interest payment to revenue receipts to be brought down to 15% in case of state government
115. The above ratios were computed for all four NCR states namely Haryana, Delhi, Uttar Pradesh and Rajasthan and the comparison is shown in **Table 2-7**.
116. The analysis shows that **Haryana** has achieved most of the targets in 2008-09 except the revenue deficit and fiscal deficit which has slipped marginally. However due to the slow down in the economy the deficit has increased in the year 2008-09. Even the Centre in its budget has relaxed the norms of gross fiscal deficit by 0.5% for 2008-09 and further 0.5% for 2009-10 to extend the fiscal stimulus to accelerate the growth in economy. Further all other recommendations given by 12th finance commissions have been achieved by the state. The growth rate of gross state domestic product at nominal rates is about 9.35% and 8.02% in the year 2007-08 and 2008-09 respectively. On the whole, Haryana has demonstrated better economic and fiscal management.

Table 2-7: Comparison of State Fiscal Indicators

Details	Norms	Haryana		Delhi		Rajasthan		Uttar Pradesh		Consolidation of 27 states (w.r.t GDP)		National (w.r.t GDP)	
		FY08	FY09	FY08	FY09	FY08	FY09	FY08	FY09	FY08	FY09	FY08	FY09
Revenue deficit/GSDP	by FY09	0.12%	2.04%	Surplus by 2.65%	Surplus by 3.69%	Surplus by 0.20%	Surplus by 0.89%	Surplus by 3.54%	Surplus by 4.05%	Surplus by 0.9%	Surplus by 0.1%	0.20%	4.40%
fiscal deficit/GSDP	<3%	3.46%	5.39%	5.12%	4.33%	Surplus by 0.15%	Surplus by 0.14%	0.83%	Surplus by 0.68%	1.50%	2.70%	4.20%	8.90%
Debt/GSDP	by FY10	27.50%	28.61%	26.34%	23.24%	61.22%	63.43%	--	--	27.80%	27.10%	60.10%	58.90%
Interest payment/revenue receipts	<15%	1.88%	0.81%	16.49%	14.02%	19.65%	19.52%	18.31%	17.00%	2.10%	2.00%	24.60%	24.50%
Tax Income/GSDP	7.6% by FY10	2.72%	4.41%	12.14%	11.47%	10.19%	10.96%	10.89%	11.93%	9.20%	9.40%	18.50%	18.10%
GSDP Growth at nominal rates		9.35%	8.02%	15.06%	12.48%	7.11%	5.48%	7.16%	6.46%	--	--	9.01%	6.70%

#Source: RBI Annual report 2008-09 and respective Government website. Data on debt outstanding for UP is not available hence not included.

2. *Cost Recovery and Profitability*

117. Where cost recovery and/or profitability are primary objectives, the financial consequences of policies, strategies, and practices relating to the entity's (IA) operations or trade should be set out, for instance: (i) policies on recovery of costs of its products and/or services, (ii) tariffs and charges levied, (iii) systems of establishing costs of products and/or services, (iv) inventory controls, and (v) possibility and extent of external regulation (e.g., by government).
118. *Existing Scenario.* PHED and HUDA are responsible for water supply including development, operation and maintenance of the water supply in the city. Presently there is water charges but with different rates and is operating on budget support. PHED could collect only less than half of its O&M cost requirements through user charges and thus heavily depends upon budget support.
119. *Policy Initiatives.* PHED does not have adequate operational income through flat rate system to finance operational expenses, whereas HUDA has the differential user charges based on metering system. This calls for institutional reform to improve the financial base in the short term, including (i) uniform water charges for both PHED & HUDA supply areas based on metering system, (ii) a gradual increase in user charges with objective of minimum 100% recovery of O&M and gradual recovery of capital costs, and (iii) improvement in collection efficiency. The memorandum of agreement for the JNNURM financing requires ULBs, amongst others things, to adopt (i) accrual-based double-entry accounting, (ii) geographic information systems based property tax with collection efficiency at 85% within the next 7 years, and (iii) reasonable user charges for O&M cost recovery within the next 7 years. This stimulates considerable reform approach among the states in municipal administration, including Haryana State.
120. Both ADB and JNNURM, the major urban development partners of the state, have focused on 100% O&M cost recovery through user charges as the medium term targets for urban infrastructure projects.

3. *User Charges*

58. The project benefits are city-wide and this is an obligatory basic service (service project with commercial potential) and is mostly met out of general taxation (Property Tax based) and or government budget support and user charge revenue. Also there is scope for private sector in water supply operation fully or partially in which case commercial viability will be the additional requirement. There fore it would be necessary for the PHED to revise user charge to raise revenues to meet the O&M cost and if possible the capital cost also.

4. *Financial Improvement Action Plan*

121. PHED Panipat City Division level ULB level financial projection analysis indicates that even in the case of existing user charges along with increase in collection efficiency, the full water supply project may require government support or revision of user charges for Panipat. This is mainly because the projected revenue account and the resultant overall status of financial for Panipat Division PHED do not have adequate strength to support the present project in total. However, as an essential function, the proposed water supply project can not be compromised. Hence, a stand alone project level financial analysis was carried out, with possible and required revenue support through user charges.

5. *Affordability Analysis*

122. Flat rate of monthly user charges collected from domestic consumers is the major revenue source for PHED for providing water supply to Panipat Town. Present rate of Rs 25 per month for single tap was found to be reduced from Rs 50 per month in the recent past and this is one of the reason for PHED at both division and state level that it could not recover even 50% of the O&M expenditure. This clearly indicates the present level of subsidizing water supply in Haryana state including Panipat Town from budgetary sources.

123. With the backdrop of the willingness to pay survey results for water supply system in Panipat, the consumers were found willing to increase the present monthly user charges to a maximum of 30% for improving the existing water supply service level. Keeping the present user charge as the base and its increase by 30% will not be sufficient to cover its 100% O&M only. Considering the precarious revenue position of PHED, it can be assumed of reverting to the previous user charges rate and its increase by 30% can be the acceptable rates for the users with assumption that the recent reduction in user charge was only politically motivated. However, implementation of this at state level will require policy decision at government level. Considering the earlier user charge rates (Rs. 50 per month for un metered domestic connections) with the acceptable 30 % increase during the project operation start year as the affordable rate that underlines the 'effective demand' , an appropriate 'Financial Improvement Action Plan' (FIAP) is worked out and presented in **Table 2.8**.

124. The FIAP discussed in Table below was developed with the premise of at least 100% O&M recovery through user charges and the capital cost can be subsidized from the state through the budget resources.

Table 2-8: Financial Improvement Action Plan

Item	Current	Project Implementation Period			Post implementation	
		2010-11	2011-12	2012-13	2013-14	Remarks
Water Supply						
Monthly User charges - Domestic (Rs)	25	-	-	-	65	25% increase in FY 2019-20 and once in every five years subsequently
Monthly User charges - Non-Domestic (Rs)	Rs 2.5 per KL		-	-	Rs 5.2 per KL	
% ARV for Conservancy in Property Tax	Nil				Nil	

Source: Consultant

6. Cost benefit analysis

125. The projects for the purpose of financial analysis have been categorized as Service, Cost Recovery and Remunerative. The present project of water supply is a Cost Recovery one based on ‘user charges’ concept and accordingly feasibility analysis is carried out.
126. *Weighted Average Cost of Capital:* The financial viability of subprojects was assessed by comparing the subproject’s financial internal rate of return (FIRR) with the financial opportunity cost of capital. As proxy for the financial opportunity cost of capital, the weighted average cost of capital (WACC) of the subprojects in real terms is used. The FIRR is the discount rate that equalizes the present values of costs and revenues over the subproject life, while the WACC represents the cost incurred by the PHED with the support of the Haryana State government in raising the capital necessary to implement the subprojects. The WACC was estimated based on the central governments on lending policy.

Table 2-9: Weighted Average Cost of Capital (%) - Uttar Pradesh & Haryana

Item	NCRPB Lending b	Govt. of India Grant a	ULB Equity	WACC
Amount weighting	75%	0%	25%	
Nominal cost	9.00%	8.50%	10.00%	
Tax Rate	0	0	0	
Tax-Adjustable Nominal Cost	9.00%	8.50%	10.00%	
Inflation Rate	4.50%	4.50%	5.50%	
Real Cost	4.50%	4.00%	4.50%	
Minimum rate test [4.0%] ^d	4.00%	4.00%	4.50%	
Weighted Component of WACC	3.38%	0.00%	1.13%	4.50%

WACC = weighted average cost of capital, UP = Uttar Pradesh,

a - Nominal cost of Government of India grant is estimated at 8.5%, based on the Government’s long-term bond rate.

b - Indicative Lending Rates for Loans by NCRPB for urban infrastructure projects

c - Global Price escalation is based on - INTERNATIONAL COST ESCALATION FACTORS 2008–2012, World Bank, Table 1.1 The global outlook in summary. Global Development Finance 2008: The Role of International Banking, page 8.

d - Preparing and Appraising Investment Projects, Guidelines for the Financial Governance and Management of Investment Projects Financed by ADB (pp 26)

7. Financial Analysis of Subprojects

127. The revenue streams for the financial analysis of sub project include the existing monthly charge with a revision proposed from 2012-13. A decision on implementing the above discussed revenue stream is critical to project sustenance. Apart from a revision on completion of the capital works, it would be necessary to revise the water user charges periodically so as to compensate the increasing O&M cost.
128. The key assumptions used for analysis include:
- Reverting to the earlier monthly charge rates
 - Increase these user charges by 30% during the operation start year (2013-14)

- one-time connection charge for new connections;
- revision to the user charge periodically;
- Maintain user charge collection percentages at least 80% of the demand,
- No property tax based levy

129. Initial project capital cost is estimated to Rs.1613.15 million to be implanted during the three year constriction period.

Table 2-10: Project Capital Cost - Rs Million

Details	Cost Rs Million
Base Cost	1613.15
Landed Cost	2015.98

Source: Consultant

130. Financial sustainability and viability analysis results for the proposed cost out flow (capital and O&M) and the user charge based revenue inflow indicate that there is no cost recovery in terms positive FIRR. However, the revenue stream can sustain the full O&M cost during the analysis period.

131. To achieve the full cost recovery that equates the FIRR level to WACC of 4.5%, the present monthly user charge of Rs 25 need to be increased more than four times during the operation start year and this is outside the affordable level indicted in willingness to pay survey results.

8. Risk Analysis

132. Of the four sensitivity scenarios (cost overrun, O&M cost increase, reduced beneficiaries, revenue delay by one year) Project Revenue delay by one year is the most vulnerable to project cash flow, followed by reduced beneficiaries and cost overrun. Considering the more sensitiveness of these variables, following implementation arrangements need to be focused more so as minimize the project risk:

- Timely implementation of the project user charges through appropriate method;
- Timely implementation of the project through appropriate procurement method in which incentive for early completion may be included;
- Ensuring adequate project coverage of beneficiaries through advance commitment from HHs for individual access or making mandatory for all individual access through project design;
- Adequate focus for LA related project components

9. *Conclusion*

133. The main evaluation has indicated that the proposed water supply sub project for Panipat Town was not found to be financially viable, with the calculated FIRR values are lower to the WACC (4.15%), for the recommended user charges under FIAP. This under lines that the project cannot support cost recovery. However, in tune to the present state policy, the project can recover 100% O&M through user charges. By demonstration of the increase to the quality and quantity of the water supply service to the consumers, PHED can pursue the cost recovery policy in stages in such a way that for partial capital recovery in the first stage and full cost recovery in the next stage in the long run

Appendices

Appendix 1-1: Economic Cost

1. The economic costs of capital works and annual operation and maintenance are calculated from the financial cost estimates on the following basis:

- (i) Price contingencies are excluded but physical contingencies are included because they represent real consumption of resources;
- (ii) Import duties and taxes are excluded because they represent transfer payments. For this the shadow exchange rate factor worked out below was used;

Table 1: Shadow exchange rate factor

Details	2008-09	2007-08	2006-07	2005-06
	RE	Actual	Actual	Actual
National export (free on board) = Ex *	766,934	655,864	571,779	456,418
National import (CIF) = Im*	1,305,503	1,012,312	840,506	660,409
Customs Duties =Ct*	84,710	72,029	62,819	46,645
AD-HOC STANDARD CONVERSION FACTOR (CF = (Ex + Im)/(Ex + Im+Ct))	0.961	0.959	0.957	0.960
Shadow exchange rate factor (Y):(Y=1/CF)	1.04	1.04	1.04	1.04

* - Source : Reserve Bank of India

RE - Revised Estimates

Note: Calculation Method based on the handout on Economic Analysis

- (iii) The existence of unemployment and under-employment for unskilled workers within the Indian economy means that the opportunity cost of unskilled labour can be considered to be lower than its wage rate – a conversion factor of 0.5 of the market wage rate for agriculture casual labour is used to estimate the shadow wage rate;

Table 2: Shadow Wage-rate Factor (Y)

Casual agriculture labor cost (Rs. per day)* (L)	80
National minimum wage of unskilled worker (Rs. per day)** (M)	138
Shadow Wage-rate Factor (Y); Y = L/M	0.58

*- Minimum Agricultural Labor wage fixed by many sates under NREGA at Rs. 80 a day (for men working six hours) and Rs. 70 (for women working five hours)

** Ltr No. 28214-308 dated : 27/05/08 , issued from the Office of Labour Commissioner, Haryana.

- (iv) The market wage rate for skilled labour and the acquisition cost of land are considered to represent opportunity costs, as both factors are in demand;
- (v) All costs are valued using the domestic price numeraire, to enable an easier comparison with the information used to measure benefits (e.g. a significant component of benefit is the savings in resources, which would be used in the without project situation).

2. Estimated financial base cost without contingencies and allowances for the Panipat Water Supply project is estimated Rs. 1613.15 million as shown in **Table 3**. Using the basis, the economic cost (resource cost) was estimated both for capital cost and operation & maintenance costs and presented in **Tables 4 & 5**. For estimating the economic cost from the financial cost, the following other assumptions were also considered:

A. Capital Cost

- Contingences and other allowances considered to the base cost (12%):
 - Design Supervision Consultancy (DSC)+ Third Party Inspection (TPI) - 3%,
 - Information, Education & Communication (IEC) activities 1%,
 - Incremental Administration (PIU) – 2%,
 - Physical contingency 3%,
 - Environmental mitigation 1%,
 - Social intervention 1%,
 - Institutional development and capacity building activities 1%
- Share of foreign cost to total project cost

Share of foreign Cost (%)

Sector	Services	Materials	Total
Water Supply	0.75%	2%	2.75%
Sewerage	0.75%	0%	0.75%
Drainage	0.75%	0%	0.75%
SWM	0.75%	0%	0.75%
Urban Transport	0.75%	0%	0.75%

- Tax and duties
 - Local cost – 12%
 - Foreign Cost – 4%
- Share of unskilled labor in Local Cost – 12%

B. Maintenance Cost

- Share of foreign cost to total project cost
 - Water supply – 0%
 - Sewer – 0%
 - Storm water Drainage – 0%
 - Solid Waste Management – 0%
 - Urban Transport – 0%
- Tax and duties
 - Local cost – 12%
 - Foreign Cost – 4%
- Share of unskilled labor in Local Cost – 15%

Table 3: Details of Base Financial Cost (Panipat Water Supply)

Sl. No.	Details	Rs. Million
1	Providing out lets in WJC Canal and Delhi Parallel Canal of 100 cusecs each and construction of inlet channel up to RWPS site (As per estimate from Irrigation Department)	47.88
2	Construction of Raw Water Pumping Station comprising of Sump, Pump House building and 6nos. VT Pumping sets with required electrical switch gear (Total KW 210)@Rs25000 per KW	5.25
3	Construction of Water Treatment Plant complete of 100 MLD including SCADA system @ Rs.25 lac/MLD	250
4	Construction of Clear Water Pumping Station comprising of Sump, Pump House building and 3 nos. Pumping sets with required electrical switch gear(Total 1125 KW)@Rs25000 per KW	28.13
5	Construction of Clear Water Reservoir near WTP of 10 ML capacity @Rs.2000 per KL	20
6	Providing 33 KV Electrical feeder line from 132 KV GSS to WTP site along with construction of 33/11 KV & 33/0.4KV substation 1500KVA & 315KVA (As per estimate of Electricity department)	21.6
7	Cost of land 33 acres land required for construction of WTP, RWPH, CWPS, supporting infrastructure etc.@ Rs.30 lac/acre	99
8	Cost of pumping main pipe line BWSC/MS/DI complete with valves, chambers, rail line and NHW crossings etc. complete	256.72
9	Construction of 17 nos. OHSR with a staging of 20m and a total storage capacity of 25.75 ML complete in all respect @Rs.8000 per KL and one GLSR of 2 ML @3000	212
10	Improvement of distribution system in zones where water supply network already exist or un-served areas by laying of new, additional or higher sized pipelines with required appurtenances, chambers, thrust blocks etc.	263.12
11	Providing Bulk water meters (1 no EMFB type) and 33000 Domestic water meters complete including installation and commissioning	155
12	Replacement of consumer service pipe lines with MDPE pipes for 33000 connections @Rs.1500 per connection	54.45
13	NRW Identification and Reduction Works lump sum	150
14	Centralized Training Center of PHED lump sum	50
15	Total	1613.15

Source: Consultant Estimates

Table 4: Details of Resource Cost Estimation – Capital Cost (Panipat Water Supply)

Details	Financial Cost (Capital)		Resource Cost (Capital)	
		Rs Million	Rs Million	S P Factor
Base Cost		1,613.15		
Allowances	12%	193.58		
Foreign Cost				
- Base cost & allowance	1%	13.55	14.09	1.04
- Taxes & Duties	4%	0.53	-	-
		14.08	14.09	
Local Cost				
- Unskilled labour	12%	215.18	107.59	0.50
- Skilled labour & Others	88%	1,578.00	1,578.00	1.00
- Taxes & Duties	12%	208.73	-	-
		2,001.90	1,685.59	
Total		2,015.98	1,699.68	

Table 5: Details of Resource Cost Estimation – O&M Cost (Panipat Water Supply)

Details	Financial Cost (O&M)		Resource Cost (Capital)	
		Rs Million	Rs Million	S P Factor
O&M Cost	61.76	-		
		-		
Foreign Cost	0%			
- Base cost	0.00	0.00	-	-
	-	-	-	-
Local Cost	100%			
- Unskilled labour (25%)	15.44	0.00	7.72	-
- Skilled labour & Others (75%)	46.32	0.00	46.32	-
	61.76	-	54.04	-
Total	61.76	-	54.04	-

3. Considering 2009-10 as base year followed by four construction period and 20 years implementation period considered for the analysis, the cash outflow for economic cost was worked out and presented in **Table 6**.

Table 6: Details of Phasing and Expenditure Flow
Economic Cost –Water Supply (Panipat, Haryana)

all values in Rs. Million

Phasing	Year	Capital Cost	O & M Cost	
0.00%	2009-10	-	-	
10.00%	2010-11	169.97	-	
50.00%	2011-12	849.84	5.40	
40.00%	2012-13	679.87	32.42	
	2013-14	-	54.04	
	2014-15	-	54.04	
	2015-16	-	54.04	
	2016-17	-	54.04	
	2017-18	-	54.04	
	2018-19	-	54.04	
	2019-20	-	54.04	
	2020-21	-	54.04	
	2021-22	-	54.04	
	2022-23	-	54.04	
	2023-24	-	54.04	
	2024-25	-	54.04	
	2025-26	-	54.04	
	2026-27	-	54.04	
	2027-28	-	54.04	
	2028-29	-	54.04	
	2029-30	-	54.04	
	2030-31	-	54.04	
	2031-32	-	54.04	
	2032-33	-	54.04	

Appendix 1-2: Valuing Economic Benefits

1. Valuing Economic Benefits – Panipat Water Supply Subproject

1.1 Project Beneficiaries

1. Project beneficiaries will comprise households with existing connections and households with new connections who previously obtained municipal water from stand posts. The number of households benefiting is shown in **Table 1**. There could also be benefits to households, which continue to use stand posts due to better facilities, less crowding and time spent at the stand posts; however, the data required to quantify these benefits are either not reliable or not available.

- The water supply component is expected to benefit 530192 (37 percent Slum population and 63 percent non-slum population) and 95575 households in Panipat by 2013 (the full operational year of distribution network improvements). This represents about 100 percent of the projected population.

Table 1: Water Supply Component Project Beneficiaries, Panipat

Details	Slum HHs	Non-Slum HHS	Total
Total beneficiary population-2013 ^{a/}	196,171	334,021	530,192
% Distribution ^{b/}	37%	63%	100%
Average HH size ^{c/}	5.56	5.54	5.55
Total beneficiary HHs	35,283	60,293	95,575
% Distribution	37%	63%	100%
Projected Population (2011)	184,687	314,467	499,154
% of population covered			100%

a/ Households benefited by Water Supply Project in 2013, the project start year under Phase I

b/ Assumed distribution of population/HHs is by Socio-economic Survey results.

c/ Average HH size is arrived from the Baseline Survey in Panipat (2009)

1.2 Valuing Economic Benefits

2. The present water supply system covers only part of the town area and is with more deficiencies in service delivery. Also the Water Supply Master Plan (WSMP) prepared for the town has identified deficiencies and formulated recommendations to be implemented in phased manner that include (i) increased water supply as per the CPHEEO norms; (ii) 100 percent coverage; (iii) shifting the water source from ground water to canal water and (iv) ensuring 24 hours water supply.. Thus the main project rationale lies for the rehabilitation of the water supply system for Panipat Town in filling the demand – supply gap resulted from

- Lack of coverage and

- Inefficient functioning of the existing system

3. The water supply component normally comprise of three types of improvements: (i) augmentation of supply, (ii) strengthening of the existing distribution network and laying of additional distribution network for uncovered areas and, (iii) Rehabilitation of existing water treatment plants and transmission mains.,.

4. This project will cover all the above three items. The economic (and financial) cost-benefit analysis therefore considers all types of improvements together. Benefits considered for the analysis include:

- Resource Cost Savings
- *Water Collection Avoidance Costs*
- *Health Benefits*
- *Opportunity Cost for Diverted Water (negative benefit)*

5. The benefits of the water supply component are quantified as follows:

- (i) Resource Cost Savings. In supplying the existing volume of piped water more efficiently, measured in terms of the average cost of supply with and without the Project. This has two major components for the purpose of benefit quantification:
 - (a) *Non-incremental Water Supply.* This component includes the increase in water sold from the public system due to the Project but resulting in no effect on total consumption for the following reasons (a) the non-incremental water supply replaces water consumed from private vendors, shallow wells and tanks/rivers; and (b) the non-incremental water supply due to the reduction in non-technical loss due to the proposed Project. The benefit is evaluated by using the supply cost of replaced water sources.
 - (b) *Incremental Water Supply.* This component has a positive effect on the total consumption due to the proposed Project. This component of benefit is evaluated by using the demand price, or willingness to pay (WTP) for additional consumption. Based on the WTP survey analysis results, the demand price is assumed to be equal to the supply price to be decided by the ULB from time to time, in the present analysis.

6. *Supply Prices and Unit Costs.* The following assumptions have been made in the absence of data on average supply prices:

- (i) The existing water tariffs for domestic household supply is a flat rate of Rs. 25 per month, meters are not used. Average household consumption details collected from

socio-economic survey (17kl/month with a supply price of Rs 1.5/kl) and designed supply is 22.5kl/month (@ 135 lpcd consumption, with a supply price of Rs.1.1/kl). The disparity in consumption and supply quantity is due to the UFW and under this project it is planned to have an average supply rate of 135 lpcd at the consumer end and therefore, for analysis purpose, an average household consumption of 22.5 kl/month was adopted (based on 5.5 persons per household in Panipat)

- (ii) The existing water tariffs for commercial and industrial supply are 2.5 and 4 times the domestic household supply tariff, as followed for financial analysis.
- (iii) The efficiency improvements to be achieved by the Project will result in reduction of the unit cost of supplying the existing volume of piped water, using the UFW percent as an indicator of efficiency.

7. *Effective Demand for Water Supply:* The socio-economic baseline survey was aimed at understanding the perception of the public towards the existing urban civic infrastructure and their service levels including their opinion towards the improvement of these services and their willingness to pay for assessing the 'effective demand'. Though this survey had covered the 'willingness to pay' aspect, it was not given specific focus so as to amend the results to statistical framework.

8. The Base line Survey results had indicated that 63 percent of slum households (HHs) and 47 percent HHs in the non-slum category are willing to avail the new connections if available and most of these HHs were not presently covered by the water supply (WS). Though 100% of the HHs that are willing to avail the service are willing to pay the user charges for the new household level connections, 88% of non-slum HHs and 100% of slum HHs were opinioned to pay less than Rs 150 per month. Present monthly charge for domestic connection is Rs 25 (It was reduced from Rs 50 per month to Rs 25 per month recently). Also, in general, HHs were found with willing to pay the increased user charges with additional 20% to the existing one, for the increased service levels.

9. *Water Collection Avoidance Costs:* The baseline/socio-economic survey identified time spent in collecting water from public standposts and wells as the main cost of coping with inadequate water supply by consumers with individual household connections. Rainwater harvesting systems were found to be almost non-existent. Time saved in collecting water has an economic value, in being applicable as income-earning opportunities, household maintenance functions or increased leisure and reduced mental stress. This value can be estimated by considering the daily activities of an urban woman in India, as this task is generally considered to be the responsibility of the woman of the household. This analysis results in a valuation of the time spent in collecting water at around 50 percent of the urban female wage rate and equates to

an economic value of Rs. 10 per hour.¹ The benefits shown assume that all additional connections are to individual households rather than shared connections, which would involve less time savings for accessing households (**Table 2**).

Table 2: Estimation of Water Collection Avoidance Costs -

Detail	Panipat Town
Avr. Time spent (Hour) a/	0.39
Aver. Time Savings (Hour) b/	0.31
Time value/hour c/ d/	9.86
No. of HHs benefited (@ 100% of total HHs) - 2013	95,575
Total time spent on Waste Disposal by HHs/Year (Rs Million)	106.54

a/ as per Household Baseline Survey in Panipat Town, 2009

b/ It is assumed that 80% of the collection time from other sources will be saved, due to house connections

c/ Ltr No. 28214-308 dated : 27/05/08 , issued from the Office of Labour Commissioner , Haryana

d./ Marginal workers are assumed to be employed half of the time and accordingly 50% of the wage rate is considered for analysis.

10. *Health Benefits.* Better quality of drinking water resulting from the Project avoids health expenditure and the economic value of sick days saved. Research findings indicate that sanitation improvements results in more health benefits, mainly in terms of reducing the waterborne diseases.

“The regression results reported in Table 2, show that expenditures on sanitation had a large impact on reducing the waterborne disease death rate. Sewage capital (particularly the initial sewage treatment works) and refuse collection and disposal had particularly large effects”.

*“Over all the cities in the pooled sample, a one percent increase in each of the six categories would have saved 18 lives annually in the average-sized city”.*²

11. According to the National Sample Survey Organisation survey findings, the monthly percapita expenditure on non-institutional medicine in urban areas was Rs 32.30 (2004-05)³ and estimated to Rs 41 for 2008-09. If one include the institutional medical expenditure, the total household medical annual medical expenditure will be high and at national level this is estimated

¹ As suggested in ‘Hand Book for the Economic Analysis of Water Supply Projects’, 1999, Asian Development Bank, 50% of the market wage rate for unskilled female labour. In the present case, Rs. 138 per day as unskilled labour wage rate, prevailing in the Haryana State, is adopted for time value calculations. Time value for water collection per hour (Rs.) = (Unskilled wage rate (Rs. 138) / Number of working hours (7)) x 50%

² DEATH AND SPENDING: URBAN MORTALITY AND MUNICIPAL EXPENDITURE ON SANITATION, Louis Cain Department of Economics Loyola University Chicago & Elyce Rotella, Economics Department 105 Wylie Hall Indiana University

³ Household Consumption of Various Goods and Services in India, 2004-05, NATIONAL SAMPLE SURVEY ORGANISATION, MINISTRY OF STATISTICS AND PROGRAMME IMPLEMENTATION, Press Note Dated 30th April 2007

to be Rs 5000 – Rs 6000. Improvement to water supply for better quality of drinking water in urban areas will help to reduce this high incidence of annual household medical expenditure by reducing the impact of waterborne diseases considerably. This will apply to the present project cities also.

12. Baseline survey respondents generally had difficulty separating out the costs of treating environmental sanitation diseases from other diseases. **Table 3** indicates average monthly household expenditure on health care and this expenditure as a percentage of household income. These assumptions are based upon the available secondary data resources, results from the socio-economic baseline study conducted by the ADB TA Consultant and finally the discussions with the HHs in the project city.

Table 3: Estimated Savings in Household Expenditure on Health (Rs.)- Water Supply Project in Panipat

Details	Slum HHs	Non-Slum HHs
Annual HH income ^{a/}	73,404	136,704
% of Income for Health Exp. ^{b/}	5.2%	6.6%
Annual Health Exp. / HHs	3,817	9,022
Annual Sanitation related health Exp./ HHs (12%) ^{a/} (Rs.)	457	1,080
Annual Health exp. due to Water Supply (Rs) - 45%/HH ^{d/}	206	486
Annual Health exp.avoidance due to the proposed SWM (Rs) -75%/HH ^{c/}	154	364
Total Annual earning lost during sick days ^{e/}	1,380	1,380
Annual Savings in earning lost during sick days due to WS(@ of 45% of earning lost)	621	621
Total Health Benefits /HH	775	985
No. of HHs benefited (@ 100% of total HHs) - 2013 ^{a/}	35,283	60,293
Annual Savings in Health Expenditure (Rs Million)	27.35	59.41

a/ as per Household Baseline Survey in Panipat, 2009

b/ National Sample Survey on Consumption Expenditure, 50 th round, 55 th round & 61st Round

c/ Out of the estimated health expenditure estimated due to SWM, only 75% is assumed as savings due to the project.

d/ Assumed based on the procedures followed in similar studies in India

13. The avoided health care costs per household were applied in full to the number of households benefiting from water supply improvement. The inadequacies of the existing water supply system were considered major contributing factors to personal hygiene and public health conditions. The risk of environmental sanitation-related diseases would be reduced with properly maintained and functioning water supply.

14. *Opportunity Cost for Diverted Water:* Proposed project envisage of changing the water supply source from ground water to surface water from the nearby canal. This process will reduce the supply of canal water available for irrigation purpose. Hence the opportunity cost of the water diverted from agricultural purpose was estimated (**Table 4**) and the same was treated as negative benefit to the project.

Table 4: Estimate of Opportunity Cost for Diverted Water

Additional extraction	MLD	112.5
Additional extraction	Lr/Yr	30,796,875,000
Req. standing water for Wheat cultivation	l/m2	2,000
Area coverage	m2	15,398,438
	Ha	1,540
	acre	3,803
production / acre	Rs	18,000
total production	Rs	68,461,453
loss due to non-availability of water a/	Rs million	34.23

a/ It is assumed that 50% of the production will be lost due to non-availability of water & the balance 50% of the production will be realized through other crops with other water source

15. *Exclusions.* The following benefits of water supply project have not been quantified for want of adequate data and quantification techniques. These qualitative benefits along with the quantifiable benefits discusses above, the proposed water supply system will tend to provide better living condition in the project town.

- (i) Public cost of treating water borne diseases due to poor environmental sanitation;
- (ii) Effects on businesses and industries, such as aquaculture and fisheries, agriculture and washing; and
- (iii) Effects on tourism and tourist-related businesses.

Appendix 1-3: Economic Cost Benefit Analysis

Appendix I-III: Economic Cost -Benefit Analysis for Water Supply ProjecPanipat Town

Base Case

(Rs. in Million)

Year	Economic Cost			Economic Benefits								Net Benefits
	Capital Cost	O & M Cost	Total	Non-Incremental Water	Incremental Water	Reduction in Non-Technical Loss	Total Resource Cost Benefit	Time Cost Savings	Health Expenditure Savings	Oppurtunity cost due to diversion of water from agri. Use	Total	
2009-10	-	-	-	-	-	-	-	-	-	-	-	-
2010-11	169.97	-	169.97	-	-	-	-	-	-	-	-	(169.97)
2011-12	849.84	-	849.84	-	-	-	-	-	-	-	-	(849.84)
2012-13	679.87	-	679.87	-	-	-	-	-	-	-	-	(679.87)
2013-14	-	54.04	54.04	629.11	0.08	(0.00)	629.18	106.54	86.76	(34.23)	788.25	734.21
2014-15	-	54.04	54.04	655.82	0.09	(0.00)	655.91	109.80	89.41	(34.23)	820.89	766.85
2015-16	-	54.04	54.04	678.54	0.12	(0.00)	678.67	113.16	92.15	(34.23)	849.75	795.71
2016-17	-	54.04	54.04	704.01	0.14	(0.00)	704.15	116.63	94.97	(34.23)	881.52	827.48
2017-18	-	54.04	54.04	728.85	0.15	(0.00)	729.01	120.20	97.88	(34.23)	912.86	858.82
2018-19	-	54.04	54.04	752.98	0.17	(0.00)	753.15	123.88	100.88	(34.23)	943.68	889.64
2019-20	-	54.04	54.04	776.30	0.19	(0.00)	776.49	127.67	103.97	(34.23)	973.90	919.86
2020-21	-	54.04	54.04	792.68	0.27	(0.00)	792.95	131.58	107.15	(34.23)	997.45	943.41
2021-22	-	54.04	54.04	813.73	0.30	(0.00)	814.03	135.61	110.43	(34.23)	1,025.84	971.80
2022-23	-	54.04	54.04	833.65	0.34	(0.00)	833.99	139.76	113.82	(34.23)	1,053.33	999.30
2023-24	-	54.04	54.04	852.33	0.37	(0.00)	852.71	144.04	117.30	(34.23)	1,079.82	1,025.78
2024-25	-	54.04	54.04	869.65	0.42	(0.00)	870.07	148.45	120.89	(34.23)	1,105.18	1,051.14
2025-26	-	54.04	54.04	875.42	0.58	(0.00)	876.01	153.00	124.60	(34.23)	1,119.37	1,065.33
2026-27	-	54.04	54.04	889.05	0.65	(0.00)	889.70	157.68	128.41	(34.23)	1,141.57	1,087.53
2027-28	-	54.04	54.04	900.88	0.72	(0.00)	901.61	162.51	132.34	(34.23)	1,162.23	1,108.19
2028-29	-	54.04	54.04	910.75	0.81	(0.00)	911.56	167.49	136.40	(34.23)	1,181.22	1,127.18
2029-30	-	54.04	54.04	918.51	0.90	(0.00)	919.41	172.62	140.57	(34.23)	1,198.37	1,144.33
2030-31	-	54.04	54.04	907.57	1.26	(0.00)	908.83	177.90	144.88	(34.23)	1,197.38	1,143.35
2031-32	-	54.04	54.04	909.69	1.41	(0.00)	911.11	183.35	149.31	(34.23)	1,209.54	1,155.50
2032-33	-	54.04	54.04	909.11	1.58	(0.00)	910.69	188.97	153.89	(34.23)	1,219.31	1,165.27
Total	1,699.68	1,026.73	2,726.41	15,399.54	8.98	(0.00)	15,408.52	2,691.87	2,192.14	(650.38)	19,642.15	16,915.74
NPV@12% (Rs)	1,313.16	287.30	1,600.46	4,027.77	1.61	(0.00)	4,029.38	687.64	559.98	(181.99)	5,095.01	3,494.54
IRR (%)												37.45%

Source: Consultant

**Appendix I-III: Economic Cost - Benefit Analysis for Wa Panipat Town
One Year Delay in Implementation**

(Rs. Million)

Year	Economic Cost			Economic Benefits								Net Benefits
	Capital Cost	O & M Cost	Total	Non-Incremental Water	Incremental Water	Reduction in Non-Technical Loss	Total Resource Cost Benefit	Time Cost Savings	Health Expenditure Savings	Oppurtunity cost due to diversion of water from agri. Use	Total	
2009-10	-	-	-	-	-	-	-	-	-	-	-	-
2010-11	-	-	-	-	-	-	-	-	-	-	-	-
2011-12	169.97	-	169.97	-	-	-	-	-	-	-	-	(169.97)
2012-13	849.84	-	849.84	-	-	-	-	-	-	-	-	(849.84)
2013-14	679.87	-	679.87	-	-	-	-	-	-	-	-	(679.87)
2014-15	-	54.04	54.04	629.11	0.08	(0.00)	629.18	106.54	86.76	(34.23)	788.25	734.21
2015-16	-	54.04	54.04	655.82	0.09	(0.00)	655.91	109.80	89.41	(34.23)	820.89	766.85
2016-17	-	54.04	54.04	678.54	0.12	(0.00)	678.67	113.16	92.15	(34.23)	849.75	795.71
2017-18	-	54.04	54.04	704.01	0.14	(0.00)	704.15	116.63	94.97	(34.23)	881.52	827.48
2018-19	-	54.04	54.04	728.85	0.15	(0.00)	729.01	120.20	97.88	(34.23)	912.86	858.82
2019-20	-	54.04	54.04	752.98	0.17	(0.00)	753.15	123.88	100.88	(34.23)	943.68	889.64
2020-21	-	54.04	54.04	776.30	0.19	(0.00)	776.49	127.67	103.97	(34.23)	973.90	919.86
2021-22	-	54.04	54.04	792.68	0.27	(0.00)	792.95	131.58	107.15	(34.23)	997.45	943.41
2022-23	-	54.04	54.04	813.73	0.30	(0.00)	814.03	135.61	110.43	(34.23)	1,025.84	971.80
2023-24	-	54.04	54.04	833.65	0.34	(0.00)	833.99	139.76	113.82	(34.23)	1,053.33	999.30
2024-25	-	54.04	54.04	852.33	0.37	(0.00)	852.71	144.04	117.30	(34.23)	1,079.82	1,025.78
2025-26	-	54.04	54.04	869.65	0.42	(0.00)	870.07	148.45	120.89	(34.23)	1,105.18	1,051.14
2026-27	-	54.04	54.04	875.42	0.58	(0.00)	876.01	153.00	124.60	(34.23)	1,119.37	1,065.33
2027-28	-	54.04	54.04	889.05	0.65	(0.00)	889.70	157.68	128.41	(34.23)	1,141.57	1,087.53
2028-29	-	54.04	54.04	900.88	0.72	(0.00)	901.61	162.51	132.34	(34.23)	1,162.23	1,108.19
2029-30	-	54.04	54.04	910.75	0.81	(0.00)	911.56	167.49	136.40	(34.23)	1,181.22	1,127.18
2030-31	-	54.04	54.04	918.51	0.90	(0.00)	919.41	172.62	140.57	(34.23)	1,198.37	1,144.33
2031-32	-	54.04	54.04	907.57	1.26	(0.00)	908.83	177.90	144.88	(34.23)	1,197.38	1,143.35
2032-33	-	54.04	54.04	909.69	1.41	(0.00)	911.11	183.35	149.31	(34.23)	1,209.54	1,155.50
Total	1,699.68	1,026.73	2,726.41	15,399.54	8.98	(0.00)	15,408.52	2,691.87	2,192.14	(650.38)	19,642.15	16,915.74
NPV@12	1,172.47	252.96	1,425.43	3,536.32	1.34	(0.00)	3,537.66	601.51	489.85	(160.24)	4,468.78	3,043.36
IRR (%)												37.43%

Source: Consultant

**Appendix I-III: Economic Cost - Benefit Analysis for Water Supply Pr Panipat Town
Capital Cost Overrun by 20%**

(Rs. Million)

Year	Economic Cost			Economic Benefits								Net Benefits
	Capital Cost	O & M Cost	Total	Non-Incremental Water	Incremental Water	Reduction in Non-Technical Loss	Total Resource Cost Benefit	Time Cost Savings	Health Expenditure Savings	Oppurtunity cost due to diversion of water from agri. Use	Total	
2009-10	-	-	-	-	-	-	-	-	-	-	-	-
2010-11	203.96	-	203.96	-	-	-	-	-	-	-	-	(203.96)
2011-12	1,019.81	-	1,019.81	-	-	-	-	-	-	-	-	(1,019.81)
2012-13	815.85	-	815.85	-	-	-	-	-	-	-	-	(815.85)
2013-14	-	54.04	54.04	629.11	0.08	(0.00)	629.18	106.54	86.76	(34.23)	788.25	734.21
2014-15	-	54.04	54.04	655.82	0.09	(0.00)	655.91	109.80	89.41	(34.23)	820.89	766.85
2015-16	-	54.04	54.04	678.54	0.12	(0.00)	678.67	113.16	92.15	(34.23)	849.75	795.71
2016-17	-	54.04	54.04	704.01	0.14	(0.00)	704.15	116.63	94.97	(34.23)	881.52	827.48
2017-18	-	54.04	54.04	728.85	0.15	(0.00)	729.01	120.20	97.88	(34.23)	912.86	858.82
2018-19	-	54.04	54.04	752.98	0.17	(0.00)	753.15	123.88	100.88	(34.23)	943.68	889.64
2019-20	-	54.04	54.04	776.30	0.19	(0.00)	776.49	127.67	103.97	(34.23)	973.90	919.86
2020-21	-	54.04	54.04	792.68	0.27	(0.00)	792.95	131.58	107.15	(34.23)	997.45	943.41
2021-22	-	54.04	54.04	813.73	0.30	(0.00)	814.03	135.61	110.43	(34.23)	1,025.84	971.80
2022-23	-	54.04	54.04	833.65	0.34	(0.00)	833.99	139.76	113.82	(34.23)	1,053.33	999.30
2023-24	-	54.04	54.04	852.33	0.37	(0.00)	852.71	144.04	117.30	(34.23)	1,079.82	1,025.78
2024-25	-	54.04	54.04	869.65	0.42	(0.00)	870.07	148.45	120.89	(34.23)	1,105.18	1,051.14
2025-26	-	54.04	54.04	875.42	0.58	(0.00)	876.01	153.00	124.60	(34.23)	1,119.37	1,065.33
2026-27	-	54.04	54.04	889.05	0.65	(0.00)	889.70	157.68	128.41	(34.23)	1,141.57	1,087.53
2027-28	-	54.04	54.04	900.88	0.72	(0.00)	901.61	162.51	132.34	(34.23)	1,162.23	1,108.19
2028-29	-	54.04	54.04	910.75	0.81	(0.00)	911.56	167.49	136.40	(34.23)	1,181.22	1,127.18
2029-30	-	54.04	54.04	918.51	0.90	(0.00)	919.41	172.62	140.57	(34.23)	1,198.37	1,144.33
2030-31	-	54.04	54.04	907.57	1.26	(0.00)	908.83	177.90	144.88	(34.23)	1,197.38	1,143.35
2031-32	-	54.04	54.04	909.69	1.41	(0.00)	911.11	183.35	149.31	(34.23)	1,209.54	1,155.50
2031-33	-	54.04	54.04	909.11	1.58	(0.00)	910.69	188.97	153.89	(34.23)	1,219.31	1,165.27
Total	2,039.62	1,080.77	3,120.38	16,308.65	10.56	(0.00)	16,319.22	2,880.84	2,346.03	(684.61)	20,861.47	17,741.08
NPV@12	1,575.80	287.30	1,863.10	4,027.77	1.61	(0.00)	4,029.38	687.64	559.98	(181.99)	5,095.01	3,231.91
IRR (%)												32.52%

Source: Consultant

Appendix I-III: Economic Cost - Benefit Analysis for Wa Panipat Town
O&M Cost Overrun by 20%

(Rs. Million)

Year	Economic Cost			Economic Benefits								Net Benefits
	Capital Cost	O & M Cost	Total	Non-Incremental Water	Incremental Water	Reduction in Non-Technical Loss	Total Resource Cost Benefit	Time Cost Savings	Health Expenditure Savings	Opportunity cost due to diversion of water from agri. Use	Total	
2009-10	-	-	-	-	-	-	-	-	-	-	-	-
2010-11	169.97	-	169.97	-	-	-	-	-	-	-	-	(169.97)
2011-12	849.84	-	849.84	-	-	-	-	-	-	-	-	(849.84)
2012-13	679.87	-	679.87	-	-	-	-	-	-	-	-	(679.87)
2013-14	-	64.85	64.85	629.11	0.08	(0.00)	629.18	106.54	86.76	(34.23)	788.25	723.40
2014-15	-	64.85	64.85	655.82	0.09	(0.00)	655.91	109.80	89.41	(34.23)	820.89	756.05
2015-16	-	64.85	64.85	678.54	0.12	(0.00)	678.67	113.16	92.15	(34.23)	849.75	784.90
2016-17	-	64.85	64.85	704.01	0.14	(0.00)	704.15	116.63	94.97	(34.23)	881.52	816.67
2017-18	-	64.85	64.85	728.85	0.15	(0.00)	729.01	120.20	97.88	(34.23)	912.86	848.01
2018-19	-	64.85	64.85	752.98	0.17	(0.00)	753.15	123.88	100.88	(34.23)	943.68	878.83
2019-20	-	64.85	64.85	776.30	0.19	(0.00)	776.49	127.67	103.97	(34.23)	973.90	909.05
2020-21	-	64.85	64.85	792.68	0.27	(0.00)	792.95	131.58	107.15	(34.23)	997.45	932.61
2021-22	-	64.85	64.85	813.73	0.30	(0.00)	814.03	135.61	110.43	(34.23)	1,025.84	961.00
2022-23	-	64.85	64.85	833.65	0.34	(0.00)	833.99	139.76	113.82	(34.23)	1,053.33	988.49
2023-24	-	64.85	64.85	852.33	0.37	(0.00)	852.71	144.04	117.30	(34.23)	1,079.82	1,014.97
2024-25	-	64.85	64.85	869.65	0.42	(0.00)	870.07	148.45	120.89	(34.23)	1,105.18	1,040.34
2025-26	-	64.85	64.85	875.42	0.58	(0.00)	876.01	153.00	124.60	(34.23)	1,119.37	1,054.52
2026-27	-	64.85	64.85	889.05	0.65	(0.00)	889.70	157.68	128.41	(34.23)	1,141.57	1,076.72
2027-28	-	64.85	64.85	900.88	0.72	(0.00)	901.61	162.51	132.34	(34.23)	1,162.23	1,097.38
2028-29	-	64.85	64.85	910.75	0.81	(0.00)	911.56	167.49	136.40	(34.23)	1,181.22	1,116.37
2029-30	-	64.85	64.85	918.51	0.90	(0.00)	919.41	172.62	140.57	(34.23)	1,198.37	1,133.53
2030-31	-	64.85	64.85	907.57	1.26	(0.00)	908.83	177.90	144.88	(34.23)	1,197.38	1,132.54
2031-32	-	64.85	64.85	909.69	1.41	(0.00)	911.11	183.35	149.31	(34.23)	1,209.54	1,144.69
2031-33	-	64.85	64.85	909.11	1.58	(0.00)	910.69	188.97	153.89	(34.23)	1,219.31	1,154.47
Total	1,699.68	1,232.07	2,931.75	15,399.54	8.98	(0.00)	15,408.52	2,691.87	2,192.14	(650.38)	19,642.15	16,710.40
NPV@12	1,313.16	344.76	1,657.92	4,027.77	1.61	(0.00)	4,029.38	687.64	559.98	(181.99)	5,095.01	3,437.08
IRR (%)												37.07%

Source: Consultant

**Appendix I-III: Economic Cost - Benefit Analysis for Wa Panipat Town
Lower Project Savings Savings by 20%**

(Rs. Million)

Year	Economic Cost			Economic Benefits							Net Benefits	
	Capital Cost	O & M Cost	Total	Non-Incremental Water	Incremental Water	Reduction in Non-Technical Loss	Total Resource Cost Benefit	Time Cost Savings	Health Expenditure Savings	Oppurtunity cost due to diversion of water from agri. Use		Total
2009-10	-	-	-	-	-	-	-	-	-	-	-	-
2010-11	169.97	-	169.97	-	-	-	-	-	-	-	-	(169.97)
2011-12	849.84	-	849.84	-	-	-	-	-	-	-	-	(849.84)
2012-13	679.87	-	679.87	-	-	-	-	-	-	-	-	(679.87)
2013-14	-	54.04	54.04	503.29	0.06	(0.00)	503.35	85.23	69.41	(41.08)	616.91	562.87
2014-15	-	54.04	54.04	524.66	0.07	(0.00)	524.73	87.84	71.53	(41.08)	643.02	588.98
2015-16	-	54.04	54.04	542.84	0.10	(0.00)	542.93	90.53	73.72	(41.08)	666.11	612.07
2016-17	-	54.04	54.04	563.21	0.11	(0.00)	563.32	93.30	75.98	(41.08)	691.52	637.49
2017-18	-	54.04	54.04	583.08	0.12	(0.00)	583.21	96.16	78.31	(41.08)	716.59	662.55
2018-19	-	54.04	54.04	602.38	0.14	(0.00)	602.52	99.10	80.70	(41.08)	741.25	687.21
2019-20	-	54.04	54.04	621.04	0.15	(0.00)	621.19	102.14	83.18	(41.08)	765.43	711.39
2020-21	-	54.04	54.04	634.14	0.21	(0.00)	634.36	105.26	85.72	(41.08)	784.27	730.23
2021-22	-	54.04	54.04	650.98	0.24	(0.00)	651.22	108.49	88.35	(41.08)	806.98	752.94
2022-23	-	54.04	54.04	666.92	0.27	(0.00)	667.19	111.81	91.05	(41.08)	828.97	774.94
2023-24	-	54.04	54.04	681.87	0.30	(0.00)	682.16	115.23	93.84	(41.08)	850.16	796.12
2024-25	-	54.04	54.04	695.72	0.33	(0.00)	696.05	118.76	96.71	(41.08)	870.45	816.42
2025-26	-	54.04	54.04	700.34	0.47	(0.00)	700.80	122.40	99.68	(41.08)	881.80	827.76
2026-27	-	54.04	54.04	711.24	0.52	(0.00)	711.76	126.15	102.73	(41.08)	899.56	845.52
2027-28	-	54.04	54.04	720.70	0.58	(0.00)	721.28	130.01	105.87	(41.08)	916.09	862.05
2028-29	-	54.04	54.04	728.60	0.65	(0.00)	729.25	133.99	109.12	(41.08)	931.28	877.24
2029-30	-	54.04	54.04	734.81	0.72	(0.00)	735.53	138.09	112.46	(41.08)	945.01	890.97
2030-31	-	54.04	54.04	726.06	1.01	(0.00)	727.07	142.32	115.90	(41.08)	944.22	890.18
2031-32	-	54.04	54.04	727.75	1.13	(0.00)	728.89	146.68	119.45	(41.08)	953.94	899.90
2031-33	-	54.04	54.04	727.29	1.27	(0.00)	728.55	151.17	123.11	(41.08)	961.76	907.72
Total	1,699.68	1,080.77	2,780.45	13,046.92	8.45	(0.00)	13,055.37	2,304.67	1,876.82	(821.54)	16,415.33	13,634.88
NPV@12	1,313.16	287.30	1,600.46	3,222.21	1.29	(0.00)	3,223.50	550.11	447.99	(218.39)	4,003.21	2,402.75
IRR (%)												30.57%

Source: Consultant

Appendix I-III: Economic Cost - Benefit Analysis for Water Supply Pr Panipat Town
All Four Sensitivity Tests Together

(Rs. Million)

Year	Economic Cost			Economic Benefits								Net Benefits
	Capital Cost	O & M Cost	Total	Non-Incremental Water	Incremental Water	Reduction in Non-Technical Loss	Total Resource Cost Benefit	Time Cost Savings	Health Expenditure Savings	Opportunity cost due to diversion of water from agri. Use	Total	
2009-10	-	-	-	-	-	-	-	-	-	-	-	-
2010-11	-	-	-	-	-	-	-	-	-	-	-	-
2011-12	203.96	-	203.96	-	-	-	-	-	-	-	-	(203.96)
2012-13	1,019.81	-	1,019.81	-	-	-	-	-	-	-	-	(1,019.81)
2013-14	815.85	-	815.85	-	-	-	-	-	-	-	-	(815.85)
2014-15	-	64.85	64.85	503.29	0.06	(0.00)	503.35	85.23	69.41	(41.08)	616.91	552.06
2015-16	-	64.85	64.85	542.84	0.10	(0.00)	542.93	87.84	71.53	(41.08)	661.23	596.38
2016-17	-	64.85	64.85	563.21	0.11	(0.00)	563.32	90.53	73.72	(41.08)	686.49	621.65
2017-18	-	64.85	64.85	583.08	0.12	(0.00)	583.21	93.30	75.98	(41.08)	711.41	646.56
2018-19	-	64.85	64.85	602.38	0.14	(0.00)	602.52	96.16	78.31	(41.08)	735.91	671.06
2019-20	-	64.85	64.85	621.04	0.15	(0.00)	621.19	99.10	80.70	(41.08)	759.92	695.08
2020-21	-	64.85	64.85	634.14	0.21	(0.00)	634.36	102.14	83.18	(41.08)	778.59	713.75
2021-22	-	64.85	64.85	650.98	0.24	(0.00)	651.22	105.26	85.72	(41.08)	801.13	736.29
2022-23	-	64.85	64.85	666.92	0.27	(0.00)	667.19	108.49	88.35	(41.08)	822.95	758.10
2023-24	-	64.85	64.85	681.87	0.30	(0.00)	682.16	111.81	91.05	(41.08)	843.95	779.10
2024-25	-	64.85	64.85	695.72	0.33	(0.00)	696.05	115.23	93.84	(41.08)	864.05	799.21
2025-26	-	64.85	64.85	700.34	0.47	(0.00)	700.80	118.76	96.71	(41.08)	875.20	810.36
2026-27	-	64.85	64.85	711.24	0.52	(0.00)	711.76	122.40	99.68	(41.08)	892.76	827.91
2027-28	-	64.85	64.85	720.70	0.58	(0.00)	721.28	126.15	102.73	(41.08)	909.08	844.24
2028-29	-	64.85	64.85	728.60	0.65	(0.00)	729.25	130.01	105.87	(41.08)	924.06	859.21
2029-30	-	64.85	64.85	734.81	0.72	(0.00)	735.53	133.99	109.12	(41.08)	937.56	872.71
2030-31	-	64.85	64.85	726.06	1.01	(0.00)	727.07	138.09	112.46	(41.08)	936.54	871.70
2031-32	-	64.85	64.85	727.75	1.13	(0.00)	728.89	142.32	115.90	(41.08)	946.03	881.19
2031-33	-	64.85	64.85	727.29	1.27	(0.00)	728.55	146.68	119.45	(41.08)	953.61	888.76
Total	2,039.62	1,232.07	3,271.69	12,522.26	8.38	(0.00)	12,530.64	2,153.50	1,753.71	(780.46)	15,657.39	12,385.70
NPV@12	1,406.96	303.55	1,710.51	2,890.24	1.25	(0.00)	2,891.48	481.21	391.88	(192.28)	3,572.29	1,861.78
IRR (%)												26.43%

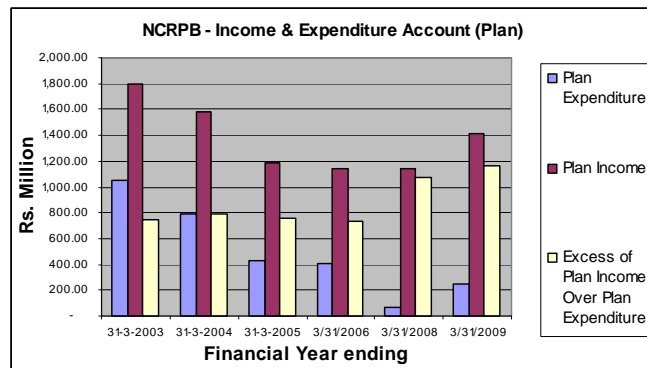
Source: Consultant

Appendix 2-1: Financial Analysis - NCRPB

National Capital Region Planning Board (NCRPB)

1. The National Capital Region Planning Board (NCRPB), constituted in 1985 under the provisions of NCRPB Act, 1985¹, is a statutory body functioning under the Ministry of Urban Development, Government of India. NCRPB has a mandate to systematically develop the National Capital Region (NCR) of India which comprises of (i) National Capital Territory Delhi (constitutes 4.4 percent of NCR area); (ii) Haryana Sub-region (40.0 percent of NCR area); (iii) Rajasthan Sub-region (23.3 percent of NCR area);(iv) Uttar Pradesh Sub-region (32.3 percent of NCR area) and (v) Five Counter Magnet Areas (CMA) The project town Ghaziabad City also part of the NCR.

2. According to the NCRPB Act, 1985 major functions of the Board include: (i)Preparation of the Regional Plan and Functional Plans; (ii) Coordinate enforcement and implementation of the Regional Plan, Functional Plans, Sub-regional Plans, and Project Plans through the participating states and NCT; (iii) Ensure proper and systematic programming by the participating states and the NCT in project formulation, determination of priorities in NCR or Sub-regions and phasing of the development of NCR in accordance with the stages indicated in regional plan; and, (v) Arrange and oversee the financing of selected development project in the NCR through Central and State Plan funds and other sources of revenue.



3. NCRPB has prepared regional plan for NCR area with the perspective year 2021. Further, the Board also initiated preparation of functional plans to elaborate one or more elements of the Regional Plan. Accordingly the functional plan for water supply and transport is under preparation but plans for other infrastructure is yet to take off.

4. NCRPB has been providing financial assistance to the participating state governments, ULBs, and other IAs in the NCR and in counter magnet towns. Till March 2008, NCRPB has financed 212 infrastructure projects involving total project outlays exceeding Rs. 139 billion. It has sanctioned loans amounting to Rs. 53 billion and disbursed Rs. 33.3 billion². NCRPB gives significant emphasis for building water supply and sanitation infrastructure.

5. NCRPB Act 1985, Chapter VI discusses the provisions for finance, accounts and audit that regulate

¹ THE NATIONAL CAPITAL REGION PLANNING BOARD ACT, 1985, No.2 OF 1985, 9th February, 1985, published by The Gazette of India on FEBRUARY 11, 1985. This Act provide for the constitution of a Planning Board for the preparation of a plan for the development of the National Capital Region and for co-ordinating and monitoring the implementation of such plan and for evolving harmonized policies for the control of land-uses and development of infrastructure in the National Capital Region so as to avoid any haphazard development of that region and for matters connected therewith or incidental thereto

² Annual Report 2007-2008, NCRPB

NCRPB accounting policies. It discusses about the financial sources, constitution of NCRPB Fund, requirement of annual budget, annual report etc, account and audit requirements, Annual auditors' report and report to be laid before Parliament.

6. The accounts of the NCRPB will be maintained and audited in such manner as may be prescribed in consultation with the Comptroller and Auditor-General of India and the Board will furnish, to the Central Government, before such date as may be prescribed, a copy of its audited accounts together with the auditors' report thereon. Annual auditors' report and report to be laid before Parliament.

7. NCRPB maintains annual accounts in the form of Income & Expenditure Account (Plan & Non-Plan), Balance Sheets and detailed Receipts & Payment Account with appropriate Schedules. Review of NCRPB Annual Accounts during the period FY 2002-03 to FY 2008-09 indicate the following: (**Table 1-1**)

- Income, expenditure and net revenue under Plan head form the major revenue source
- Plan income is observed with fluctuating trend over the analysis period.
- Plan expenditure found drastically reduced from Rs 1055 million in FY 2002-03 to Rs 252 million in FY 2008-09 which had resulted in increase trend of net plan income.
- Under Non-Plan head, both income and expenditure found to be more or less equal resulting no surplus during the analysis period.
- Under non-plan, salaries and office expenses are the major expenditure items and grant in-aids and interest receipts from provident fund are the major revenue item.

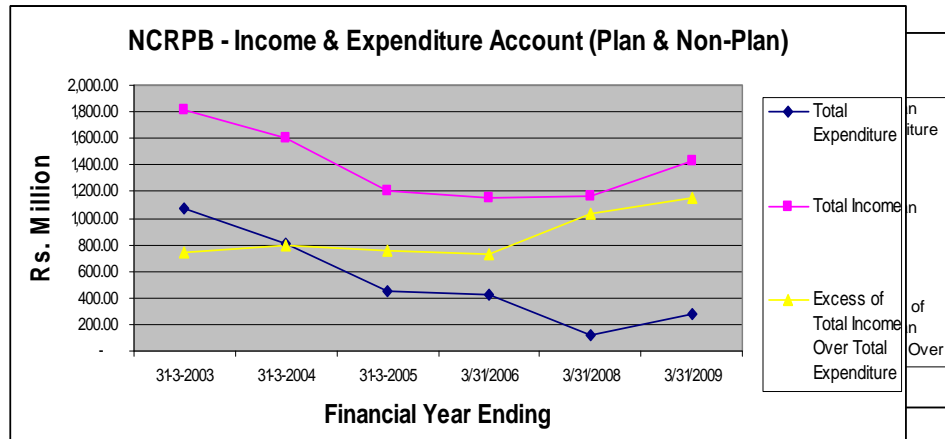


Table 1-1: NCRPB – Summary of Income & Expenditure Account

Details	Financial Year Ending					
	31/3/2003	31/3/2004	31/3/2005	3/31/2006	3/31/2008	3/31/2009
Plan Expenditure	1,055.55	790.47	432.30	403.89	63.83	252.48
Plan Income	1,796.15	1,584.47	1,190.45	1,136.77	1,141.03	1,411.11
Excess of Plan Income Over Plan Expenditure	740.60	794.00	758.14	732.88	1,077.20	1,158.63
Non-Plan Expenditure	15.14	17.94	18.96	18.32	59.99	24.62
Non-Plan Income	15.92	18.03	19.07	18.38	19.55	24.84
Excess of Non-Plan Income Over Non-Plan Expenditure	0.78	0.10	0.10	0.06	(40.44)	0.22
Total Expenditure	1,070.69	808.41	451.27	422.21	123.83	277.10
Total Income	1,812.07	1,602.50	1,209.51	1,155.15	1,160.58	1,435.95
Excess of Total Income Over Total Expenditure	741.38	794.10	758.25	732.94	1,036.75	1,158.85
Source: NCRPB Annual Reports & Annual Accounts						

8. NCR Planning Board continued to provide financial assistance to the constituent States / NCT of Delhi and their implementing agencies in the form of loans upto a maximum of 75% of the estimated cost of Projects. The constituent States of NCR/ NCT of Delhi or its implementing agency contributed a minimum of 25% of the project cost as its counter-part share. During the recent years, NCRPB's lending activity had increased considerably and from the FY 2005-06 its annual loan dispersal had crossed Rs 300 crores. Rs 705 crores were distributed as loan to infrastructure development projects during the FY 2007-08 in which transport, power and water supply were the major sectors constituting 81% of the loan dispersal.

9. There recovery rate of interest and installment of principal amount from any State Government or its implementing agencies was found to be good over the years. except one from the Patiala Urban Planning & Development Authority (PDA), Govt. of Punjab in respect of sewerage scheme of Patiala Municipal Corporation

10. In order to meet the gap between budgetary support and actual fund requirement for providing financial assistance for the infrastructure development, the Board raises from the capital market by issuing unsecured redeemable non-convertible taxable bonds periodically. The bonds have also been listed at National Stock Exchange (NSE)-WDM segment.

Appendix 2-2: Financial Analysis - PHED

Public Health Engineering Department (PHED), Haryana.

1. Introduction

1. PHED is a department of Government of Haryana (GoH). PHED is responsible for providing drinking water in both rural and urban districts of Haryana. Excepting for the two corporations of Faridabad and Gurgaon, entire State's water supply is under the jurisdiction of PHED. As a state line department, PHED is responsible for:
 - Drinking water supply facilities in rural as well as in urban areas
 - Sewerage facilities in urban areas
 - Water supply, sewerage and sanitation in govt. buildings
2. Financial sustainability addresses the required as well as appropriate taxation and tariff reforms. PHED Haryana Revenue Account and sub-project cash flows take cognizance of policy directives undertaken by PHED and HUDA in addressing infrastructure investment and sustenance needs – the focus is on water, sewer/drainage and conservancy charges. While the PHED continues to draw a substantial proportion of its income from government budget support, in the long-term, the strategy of PHED shall be to capitalize on the benefits accruing from budget support. Water supply investments as part of the city development plan (CDP) should recognize the fact that budget support pay for capital investments and user charges pay for system operation and maintenance – given the aforesaid approach, the financial sustainability analysis focuses on reviewing net cash flows arising out of budget allocation and tariff reforms

2. Organizational Structure

3. PHED is headed by Engineer-in-Chief under whom four Chief Engineers are working. One Chief Engineer is looking after Urban Projects and he is supported by Superintending Engineer (Vigilance) and Superintending Engineer (Urban) and further Executive Engineer at Division levels and Sub Divisional Engineers. Panipat Water Supply is looked after by Panipat Division headed by an Executive Engineer. Projects are executed and operated at Division levels.

3. Accounting policies and procedure

4. PHED prepares accounts as per the GoH Finance and Accounts Rules. Separate accounts for projects will have to be maintained. All the project accounts will be incorporated in the final account of PHED. The chart of accounts is adequate to account for all activities of PHED.

4. Budgeting System

5. PHED prepares the budget once in a year according to financial year (April-March following an incremental approach in which the new budget figures are based on previous year's values plus a 20-30% increase. As a result, PHED does not adopt a results oriented budget approach in which physical and financial targets are defined. Investment activities are planned by the Engineering section in accordance with the PHED Development Plan; however, funding for such activities is provided for by the Government. Operation and maintenance activities are not planned ahead but they are executed on a need basis.
6. Actual expenditure is compared with budget once in a year in February. PHED also publishes monthly financial reports comparing actual against budget figures and monthly progress reports on project execution which provide information about stage of project execution. The monthly MIS (Management Information System) Report also includes a comparison of actual financial performance against budget. A revised budget is prepared whenever necessary.

5. Accounting Policies

7. The basis of accounting is cash. Transition to accrual based accounting system will be possible only if it is adopted at State (GoH) level. Authorized signatories (of cheque payments) are the Drawing and Disbursing Officers of the Divisions of PHED –a) for Works – Executive Engineer b) for Salary – Superintending Engineer and for Head Office – Registrar as delegated by the Engineer in Chief.

6. Audit System

8. Internal Audit: Local fund audit section carries out the function of pre-audit in PHED. Apart from this there is no internal audit in PHED. This is as per the GoH finance and accounts rules. Action is taken on all audit observations.
9. External Audit: Statutory audit is done by Accountant General (AG) office. Audit is an ongoing process and compliance actions are taken against audit findings and recommendations.
10. Report and Monitoring: Financial Statements are prepared in accordance with Government accounting standards and Indian accounting standards (IAS). Three main reports are prepared, annual report (not regularly published), Monthly information system report (MIS) and the statutory Audit Report by external auditors.

7. Information System

11. Project (of various ongoing schemes of PHED) monitoring system is computerized to certain extent. Report showing status of all the ongoing projects are generated through computerized system. However reconciliation is required between the financial system and data as per

reports generated by this computerized monitoring system. Financial management and accounting system is yet to be computerized and records are manually maintained.

8. Panipat Division

12. The review of finances involves a time-series analysis of the income and expenditure of the PHED, Panipat Division of Haryana State to ascertain the trends and the major sources and uses of funds. Revenue assessment and collection performance and O&M expenditure details shown below for Panipat Division of PHED indicate that heavy dependence of budget support for both capital and maintenance works and this need to be corrected.
13. According to figures available for 2007-08, only 34% of the annual O&M expenditure could be assessed for revenue as user charges and only 60% of the assessed revenue could be collected from the users by the PHED Panipat Division that manages the water supply within the municipal limit. During the period 2005 – 2008, the average annual growth for user charges revenue was observed to be 20% while O&M expenditure found to be with 24% annual growth rate. These all indicate that the present system did not give more attention to cost recovery.

Table 1: Revenue Assessment and Collection – PHED, Panipat Division

Year	Assessment		Collection	
	Water Supply	Sewerage	Water Supply	Sewerage
<i>Rs. Million</i>				
2005-06	12.88	0.37	5.79	0.14
2006-07	15.96	0.42	8.32	0.63
2007-08	18.40	0.76	11.03	0.91
2008-09(Up to Oct 2008)	NA	NA	2.05	0.10

Source: PHED, Panipat Division

Table 2: O&M Expenditure (2004-2008) – PHED, Panipat Division (Rs. Million)

S. No.	Sub Head	2004-05	2005-06	2006-07	2007-08
1	Daily Wagers pay	0.609	0.096	0.072	0.087
2	Repair & Consumables	3.076	3.007	4.894	9.858
3	Local & other Expenditure	2.252	1.945	3.077	6.792
4	Energy Charges	22.086	32.608	24.505	36.776
	Total	28.023	37.656	32.548	53.513

Source: PHED, Panipat Division

9. PHED at State Level

14. Summarized position of income and expenditure of PHED at state level for a period of five years is given below in **Table 3** indicates that its revenue deficit is increasing at a faster rate from Rs 2809 million (FY 2004-05) to Rs 5211 million (FY2008-09) with an observed annual growth rate of 17 percent.

Table 3: Financial Performance of PHED (Rs. Million)

Particulars	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	Growth Rate %
Income:						
Water Receipts	309.69	326.64	347.42	379.62	470.70	11%
Sewerage Receipts	14.44	17.44	19.33	15.93	23.00	12%
Total Income	324.13	344.08	366.75	395.56	493.70	11%
Expenditure						
Establishment Expenditure	1653.92	779.28	1916.95	1959.00	2909.20	15%
Operations & Maintenance	1479.16	1856.46	2126.51	3010.89	2795.50	17%
Total Expenditure	3133.08	2635.74	4043.46	4969.89	5704.70	16%
Revenue Surplus / (Deficit)	(2809.0)	(2291.7)	(3676.7)	(4574.3)	(5211.0)	17%

Source: PHED, Haryana

15. PHED follows cash based system of accounting and is yet to switch over to double entry accrual based accounting system. Hence, there is no balance sheet prepared for PHED. GoH is subsidizing the losses of the PHED over the years as there are constraints over revision of tariff rate(s) to meet the cost of operations.

10. Conclusion and Recommendations

16. The budget process and financial management represent important tools to keep track of the financial performance of the organization, to gauge the effectiveness of its management and to identify areas of interventions and reform. In the case of PHED, however, management reports shows that the financial statements produced by the Accounting and Finance Section of PHED are perceived more as a ritual annual presentation of financial information about operating receipts and expenditures, rather than as a tool for efficient allocation of scarce resources. In the absence of accrual based accounting system, the balance sheet of PHED showing its assets and liabilities is not prepared. Financial statements of PHED fail to provide a true and fair view of the PHED fiscal situation.
17. According to the GoH financial rules, for both the Annual and the Supplementary Budget of PHED, the final approval is given by the Ministry of Finance and the budget is then finalized. The budget process in PHED follows an incremental approach for operation and

maintenance. For capital works budget process is led by the definition of strategic targets, both physical and financial, to be achieved by the organization.

18. Over the last few years PHED has not been able to finance its operating expenditures out of own revenues. Capital expenditures are partly financed out of GoH grants, GoI loans and grants and other direct (for e.g. from NCRPB) loans.
19. PHED financial statements are subject to independent audit. According to the GoH rules the audit report should be submitted within six months from the end of the fiscal year, but usually the submission is delayed.
20. Finally, the lack of computerization of the financial management system is another serious impediment to the efficient budget process. Budget data are still recorded in the manual ledger in the accounting and finance department, while at the zonal level information on billing and collection is kept in the consumer ledger which is not reconciled with the general ledger. Financial reports are prepared by spreadsheet which is a lengthy procedure.

11. Suggested Steps for Reform

21. PHED is presently addressing these difficulties through the computerization contracts which have been approved or are about to be approved. While it is important that these system improvements proceed as planned, it is equally critical that the institutional framework is properly set up for a commercially viable entity. Many deficiencies cannot be corrected by computerization, e.g. proper recording of transactions, analysis and reconciliation of accounts, and compliance with rules and policies.
22. In addition to the above initiatives, specific intervention for the division office(s) implementing NCRPB funded project, is needed as follows:
 - i Reforming the accounting system in order to introduce and implement the accrual based double entry accounting system including development of Financial Management and Accounting System Manual in PHED;
 - ii Providing regular (refreshing) training to both the existing and new staff in the new accounting practices and the computerized management information system;
 - iii Close monitoring of the plan for computerization of the financial management and budget system;
 - iv Making the PHED management accountable to the GoH Ministry of Finance for the financial results of the Corporation by making compulsory publication of the Annual Report;
 - v Introducing the obligation to reply to the auditor's comments within a given time frame and to publish the consolidated accounts.

B. Haryana State Financial Performance

23. The increasing revenue account deficits are subsidized by GoH through budgetary allocations over the years. Haryana is the major borrower of NCRPB funds Also PHED, being a department of GoH, will be looking to GoH support for repayment obligations of loans. . Hence in addition the financial performance of GoH has also been reviewed.
24. The past financials of Haryana state is given in **Table 4**. A snap shot of the past financial position of the state government from 2004-05 to 2008-09 reflects growth in both revenues as well as expenditure. The compounded annual growth rate (CAGR) of revenue income from 2004-05 to 2007-08 is 15.37% and revenue expenditure is 9.86%. Thus the rate of growth of revenue income is more that the growth of revenue expenditure, facilitating reduction in revenue deficits from Rs. 24925.4 Million in the year 2004-05 to Rs. 1219.0 Million in the year 2007-08. However this positive trend was reversed in 2008-09 when revenues were affected by the economic slowdown, whereas revenue expenditure went up dramatically. It is hoped that this is a temporary aberration and the state will revert to its trajectory of fiscal prudence. The CAGR of capital receipts from 2004-05 to 2006-07 is 24.20%. The capital receipt growth is compared only for three years as there is an exceptional negative trend in the year 2007-08. The CAGR for capital expenditure for same three year period is 33.22% (35.38% for four years). It may be observed that the CAGR for capital expenditure is more that the capital receipt, which shows that the state is allocating more resources for plan expenditure.

Table 4: Haryana state financials

		2004-05	2005-06	2006-07	2007-08	2008-09
	<i>All in Rs. Million</i>	Actual				Revised Estimates
I	Revenue Receipts					
1	Tax Revenue	80,600	102,800	122,230	132,520	162,230
2	Non-Tax Revenue	30,900	35,740	57,290	64,990	55,480
	Total Revenue Receipts(a) = (1)+(2)	111,490	138,530	179,520	197,510	217,710
II	Capital Receipts					
3	Recoveries of Loans	1570	2900	22,010	2140	3780
4	Misc.Capital Receipts				100	140
5	Public Debt. (Net)	14,600	22,410	8980	30	34,030
	Total Capital Receipts (b) = (3)+(4)+(5)	16,170	25,310	30,990	2270	37,950
		0	0	0	0	0
	Total Receipts (c) = (a)+(b)	127,660	163,840	210,510	199,770	255,660
III	Revenue Expenditure					
	Non-Plan Expenditure	98,070	107,220	139,990	146,260	176,460
6	On Revenue Account	99,540	106,250	139,080	143,510	172,200

7	Interest Payments	22,350	21,000	22,650	23,460	23,540
	Plan Expenditure					
8	On Revenue Account	14,530	20,150	24,540	31,760	44,950
	Total Revenue Expenditure (d) = (6)+(7)+(8)	136,420	147,400	186,270	198,730	240,700
IV	Capital Expenditure					
	Non-Plan Expenditure					
9	On Capital Account	-1470	970	910	2750	4260
	Plan Expenditure					
10	On Capital Account	12,520	16,920	25,210	34,370	37,300
	Total Capital Expenditure (e) = (9)+(10)	11,050	17,890	26,120	37,120	41,560
	Total Expenditure (f) = (d)+(e)	147,470	165,290	212,400	235,840	282,250
11	Revenue Surplus(+)/Deficit(-) (g) = (a)-(d)	-24,930	-8860	-6750	-1220	-22,990
12	Fiscal Surplus(+)/Deficit(-) (h) = (c)-(5)-(f)	-34,400	-23,860	-10,860	-36,100	-60,630

Source: Haryana state budgets

25. The financial performance of the state governments has also been analysed based on 12th Finance Commission, recommendations and compared with NCR states and the national average. The 12th Finance Commission, as part of restructuring of public finances, has recommended certain measures to improve the long term financial sustainability of Centre and state governments. The suggested indicators suggested by the 12th finance commission include the following:
- The Tax to GDP ratio should be improved to 17.6 % by 2009-10
 - Debt to GDP ratio to be brought down to 75% by 2009-10
 - Fiscal deficit to GDP should be less than 3%
 - There should not be any revenue deficit by 2008-09
 - Interest payment to revenue receipts to be brought down to 15% in case of state government
26. The above ratios were computed for all four NCR states namely Haryana, Delhi, Uttar Pradesh and Rajasthan and the comparison is shown in **Table 5**.
27. The analysis shows that **Haryana** has achieved most of the targets in 2008-09 except the revenue deficit and fiscal deficit which has slipped marginally. However due to the slow down in the economy the deficit has increased in the year 2008-09. Even the Centre in its budget has relaxed the norms of gross fiscal deficit by 0.5% for 2008-09 and further 0.5% for

2009-10 to extend the fiscal stimulus to accelerate the growth in economy. Further all other recommendations given by 12th finance commissions have been achieved by the state. The growth rate of gross state domestic product at nominal rates is about 9.35% and 8.02% in the year 2007-08 and 2008-09 respectively. On the whole, Haryana has demonstrated better economic and fiscal management.

28. The analysis shows that **Rajasthan** has achieved most of the targets in 2008-09 except the interest payment to revenue receipts and tax income to GSDP which has slipped marginally. All other recommendations given by 12th finance commissions have been achieved by the state. The growth rate of gross state domestic product at nominal rates is about 7.11% and 5.48% in the year 2007-08 and 2008-09 respectively. On the whole, Rajasthan has demonstrated better economic and fiscal management.
29. The analysis shows that **Delhi** has achieved most of the targets in 2008-09 except the fiscal deficit, interest payment to revenue receipts and tax income to GSDP which has slipped marginally. All other recommendations given by 12th finance commissions have been achieved by the state. The growth rate of gross state domestic product at nominal rates is about 15.06% and 12.08% in the year 2007-08 and 2008-09 respectively. On the whole, Delhi has demonstrated better economic and fiscal management.

TABLE 5: Comparison of state fiscal indicators

Details	Norms	Haryana		Delhi		Rajasthan		Uttar Pradesh		Consolidation of 27 states (w.r.t GDP)		National (w.r.t GDP)	
		FY08	FY09	FY08	FY09	FY08	FY09	FY08	FY09	FY08	FY09	FY08	FY09
Revenue deficit/GSDP	Zero by FY09	0.12%	2.04%	Surplus by 2.65%	Surplus by 3.69%	Surplus by 0.20%	Surplus by 0.89%	Surplu s by 3.54%	Surplu s by 4.05%	Surplu s by 0.9%	Surplus by 0.1%	0.20%	4.40%
fiscal deficit/GSDP	<3%	3.46%	5.39%	5.12%	4.33%	Surplus by 0.15%	Surplus by 0.14%	0.83%	Surplu s by 0.68%	1.50%	2.70%	4.20%	8.90%
Debt/GSDP	<75% by FY10	27.50%	28.61%	26.34%	23.24%	61.22%	63.43%	--	--	27.80%	27.10%	60.10%	58.90%
Interest payment/revenue receipts	<15%	11.88%	10.81%	16.49%	14.02%	19.65%	19.52%	18.31%	17.00%	2.10%	2.00%	24.60%	24.50%
Tax Income/GSDP	7.6% by FY10	12.72%	14.41%	12.14%	11.47%	10.19%	10.96%	10.89%	11.93%	9.20%	9.40%	18.50%	18.10%
GSDP Growth at nominal rates		9.35%	8.02%	15.06%	12.48%	7.11%	5.48%	7.16%	6.46%	--	--	9.01%	6.70%

#Source: RBI Annual report 2008-09 and respective Government website. Data on debt outstanding for UP is not available hence not included.

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