Sustainability and Financial Viability of Urban Water Supply and Sanitation in Dryland Areas in India - Case Study of Indore City

Rahul Banerjee, Dhas Gramin Vikas Kendra, aarohini@yahoo.com, +919425943023

Contents

LIST OF ABBREVIATIONS

1. ADB – Asian Development Bank
2. AME – Academy of Mountain Environics
3. BSUP – Basic Services for the Urban Poor
4. CAG – Comptroller and Auditor General of India
5. CAGR – Compound Annual Growth Rate
6. CDM – Clean Development Mechanism
7. CGWA – Central Ground Water Authority
8. CGWB – Central Ground Water Board
9. CPCB – Central Pollution Control Board
10. DFID – Department for International Development, United Kingdom
11. DTCPGoMP – Department of Town and Country Planning, Government of Madhya Pradesh
12. EIRR – Economic Internal Rate of Return
13. Environment Protection Agency, Government of United States of America
14. FIRE-D – Financial Institutions Reform and Expansion (
15. FIRR – Financial Internal Rate of Return
16. GIS – Geographical Information System
17. GoI – Government of India
18. IDA – Indore Development Authority
19. IFC – International Finance Corporation
20. IHIP – Indore Habitat Improvement Project
21. IHSDP – Integrated Housing and Slum Development Programme
22. ILI – Infrastructure Leakage Index
23. IMC – Indore Municipal Corporation
24. JNNURM – Jawaharlal Nehru National Urban Renewal Mission
25. KwH – Kilowatt Hour
26. lpcd – litres per capita per day
27. lpm – litres per minute
28. MCM – Million Cubic Metres
29. MGI – Mckinsey Global Initiative
30. MIC – Mayor in Council
31. MLD – Million Litres per Day
32. MW – Mega Watt
33. NGO – Non Governmental Organisation
34. NIPFP – National Institute of Public Finance and Policy
35. NIUA – National Institute of Urban Affairs
36. NSSO – National Sample Survey Organisation
37. OBC – Other Backward Classes
38. O&M – Operation and Maintenance
39. PPP – Public Private Partnership
40. RAY – Rajiv Awaas Yojana
41. SCP – Sustainable Cities Programme
42. SESI – Slum Environment and Sanitation Initiative
43. TERI – The Energy Research Institute
44. UNEP – United Nations Environment Programme
45. UNHABITAT – United Nations Human Settlements Programme
46. USAID – United States Agency for International Development
47. VAMBAY – Valmiki Ambedkar Awaas Yojana
48. WDR – World Development Report
49. WSS – Water Supply and Sanitation
50. WSUD – Water Sensitive Urban Design

Sustainability and Financial Viability of Urban Water Supply and Sanitation in Dryland Areas in the Context of the Current Political Economy and Equity Questions - Case Study of Indore City

1. Introduction

1. 1 Background

The turn of the century from the twentieth to the twentyfirst witnessed an important historical transition. For the first time in human history more than half the population are now residing in urban habitats, which are the main drivers of economic activity. This increasing urbanisation worldwide, especially in the third world countries, is of an informal and unplanned nature and has led to tremendous social and environmental pressures on towns and cities. More than a billion people lived in cities that exceeded healthful levels of air quality, 420 million had inadequate sanitation; and 220 million city dwellers did not have access to safe drinking water (Leitmann 7). Consequently urban planning and management have currently become severely stressed.

Specifically with respect to the development of cities it came to be realised as early as in the first United Nations Conference on Environment and Human Settlements held in Vancouver in 1972 that there was a need for adequate provision of sustainable and equitable access to municipal services required to make them healthy and liveable (Mahadevia "Globalisation", 29). This was named as the "Brown Agenda"(McGrahanan and Satterthwaite 75). Subsequent to this in 1983 the World Commission on Environment and Development set up by the United Nations studied the problem of environmental degradation brought about by development. The Commission came out with a report in 1987 that for the first time put forward the concept of sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs". (United Nations Organisation, 34). Subsequent to this the issue of environmental sustainability began to assume more and more importance and in the case of urban development this was named as the "Green Agenda" (McGrahanan and Satterthwaite 75).

The increasing urbanisation of the world gave rise to the difficulty of reconciling the Brown and Green Agenda. Cities as the engines of economic growth obviously needed good civic infrastructure to be able to accommodate the growing population and burgeoning economic activity. Such a growth path had very large ecological footprints, much larger than their own territories both for resource extraction and waste disposal (Martinez Alier, 13). At the local level also problems crop up as the poor develop vast shanty towns and poverty pockets in the marginal spaces like riversides and waste lands. These are precisely the areas that the rich seek to sequester to beautify the city or for dumping garbage. The drive for environmental and financial sustainability in such circumstances leads to social conflicts as the poor get squeezed out of their habitats and livelihoods while at the same time being asked to pay for municipal services (COHRE 9).

The first World Conference on Environment held in 1992 in Rio de Janeiro further stressed the need for sustainable development. This was followed by the second UN Habitat Conference held in Istanbul in 1996 when an attempt was made to bridge the brown and green agenda and a Sustainable Cities Programme (SCP) was conceptualised and executed under the aegis of the United Nations Human Settlements Programme (UN HABITAT) and the United Nations Environment Programme (UNEP) in two phases upto 2007. However, this programme has been criticised for stressing more on the environmental and financial sustainability of city development at the cost of inclusion of the majority of poor inhabitants

of cities. Especially in the developing countries where municipal services are of poor quality and reach due to lack of resources (Mahadevia "Sustainable Urban Development" 249).

Nevertheless, stress was laid on financial sustainability of infrastructure services and private sector participation in their setting up and operation by donor agencies like the USAID, World Bank and Asian Development Bank (World Bank CAS 15). Consequently urban local governnments were pressurised to improve cost recovery for investments and operation and maintenance in the water supply and sanitation (WSS) sector from the beginning of the 21st century. This involved ringfencing the watersupply and sanitation functions of urban local bodies through the creation of separate water supply and sewerage boards and the strengthening of the capacities of these bodies to access the financial markets directly or through issuing commercial bonds (World Bank "Bridging the Gap" 35). This, has become the predominant mode of development of the WSS sector in urban areas and has been tried out in many cities. Four major cities in Madhya Pradesh, namely Indore, Bhopal, Jabalpur and Gwalior, too have seen the same kind of changes. Especially so after a loan for improvement of their WSS infrastructure and services was sanctioned by the Asian Development Bank in 2004.

The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was initiated by the Central Government in 2005 to improve the urban infrastructure and services in 35 cities with one million plus population in 2001 and 28 other urban areas of tourist or historical/religious importance (JNNURM 8). The JNNURM envisages heavy grant funding from the Central and State Governments of over Rs 1,20,000 crores over a seven year period from 2005-6 to 2012-13 to urban local bodies for specific projects, Water supply, Sanitation and Solid waste management are important areas. There is a stress here also on public private partnership to ensure that in the long run the operation and maintenance costs are recovered. Nevertheless, there is simultaneously a stress on the provision of basic services to the poor. Thus, the JNNURM seems to strike a balance between the two goals of achieving financial and social sustainability in provision of urban infrastructure and services. The cities of Bhopal, Indore and Jabalpur from Madhya Pradesh have been included under this mission.

1.2 Rationale of Study

The above discussion clearly establishes that the attainment of financial, environmental and social sustainability of urban services simultaneously is an important problematic. Given the huge investments that are being made in the improvement of urban infrastructure and services it is of the utmost importance that these investments are made in a manner that brings about the greatest good of the greatest number in a sustainable manner. Within urban infrastructure the supply of water and its disposal after use in cities has become one of the most important aspects of planning and management. This is because water has to be brought from distant sources and the wastewater needs to be treated before being discharged into natural water bodies or rivers. Urban planning cannot be undertaken unless the water supply and wastewater disposal is first accounted for. In dryland areas which are physically water scarce and constitute some 70 per cent of the country the problem becomes even more acute as the costs associated with setting up and running WSS services goes up exponentially. Thus, there is a need to study in depth the financial, environmental and social aspects of WSS infrastructure and services in big cities and especially in the dryland areas.

The situation is particularly problematical in this regard in Indore which is the largest city of Madhya Pradesh. The city is situated on the dry Malwa Plateau which is naturally water scarce similar to most parts of western, northwestern, central and peninsular India. The city also has a fairly long history of urban planning from the early twentieth century providing rich material for a critical study. This study critically reviews the financial,

environmental and social sustainability of urban water supply and sanitation infrastructure and services in the city.

1.3 Research Questions

The research questions for the study are as follows –

1. How viable are the proposed developments of WSS under the ADB plan and the JNNURM in the context of current natural and financial resource endowment of the Indore Municipal Corporation and the economic situation of the population in general and the poor in particular.
2. What are the possible improvements in WSS provisioning and governance in the city.

1.4 The Objectives of the Study

The overall goal of the study is to assess the reliability, affordability and financial, environmental and social sustainability of existing and proposed Water Supply and Sewerage (WSS) services and

The specific objectives of the present study are as follows -

1. To understand the current status of the water supply, waste water and storm water systems of the city as a whole poverty pocket areas in particular.
2. To analyse the finances of the Indore Municipal Corporation with regard to Water Supply and Wastewater Management with regard to their sustainability for the future.
3. To assess the affordability of the proposed WSS services for the population in general and the poor in particular using the National Sample Survey Organisation data.
4. To assess the feasibility of the Asian Development Bank Plan for WSS.
5. To review the working of WSS systems being implemented elsewhere in the country and the world to see how they can be adapted to WSS governance in Indore.
6. On the basis of the above make recommendations for improving WSS governance in Indore.

1.5 Methodology

This is a desk study based on a critical review of secondary sources as follows –

1. The first objective will be fulfilled by studying the Town Plans, Detailed Project Reports, Performance Reports of various projects undertaken under with funding from the JNNURM, Department For International Development (DFID), UN HABITAT and other agencies.
2. The second objective will be fulfilled by analysing the annual budget documents of the Indore Municipal Corporation.
3. The thrid objective will be fulfilled by comparing the cost of WSS services as calculated from the budget data with the Consumption Expenditure data from the National Sample Survey Organisation survey.
4. The fourth objective will be fulfilled by analysing the Detailed Project Report of the Asian Development Bank WSS improvement plan.
5. The fifth objective will be fulfilled by reviewing secondary literature on alternative WSS management in India and abroad.

2. Current Status of Research

2.1 Reconciling the Brown and Green Agenda

The World Environment Conference held in 1992 in Rio de Janeiro had ended with the adoption of a final Agenda 21 (UNEP para 7.5) in which the emerging focus areas of urban development were noted as follows –

A. Providing adequate shelter for all;
B. Improving human settlement management;
C. Promoting sustainable land use planning and management;
D. Promoting the integrated provision of environmental infrastructure: water, sanitation, drainage, hazardous and solid waste management;
E. Promoting sustainable energy and transport systems in human settlements;
F. Promoting human settlement planning and management in disaster-prone areas;
G. Promoting sustainable construction industry activities;
H. Promoting capacity-building for human settlement development.

These aspects took forward the "Brown Agenda" which had been defined earlier in 1972 but which had become more important in the context of increasing urbanisation. It involves the adequate and equitable provisioning of the following (UN HABITAT Planning 41) –

1. Water Supply systems to provide water for various domestic, municipal and industrial uses.
2. Waste systems to recycle and remove wastes from cities, including solid, liquid and air waste.
3. Energy systems to provide power, heating, cooling and lighting for all city functions.
4. Transport systems to enable mobility in the city, including the fuel.
5. Building and materials systems that provide the physical basis of life in cities.

The Rio Earth Summit also adopted a convention on the emerging problem of Climate Change called the United Nations Framework Convention on Climate Change (UNFCCC pars 1-10). This was an agreement between nations to undertake measures to reduce green house gas emissions that were contributing to global warming and climate change that could seriously jeopardise life on earth. Thus, in the case of sustainable urban development there is also a need to ensure, while following the Brown Agenda, that green house gas emissions and other harmful environmental externalities are avoided. This came to be known as the "Green Agenda" and involves the sustainable management of (UN HABITAT Planning 41) –

1. Ecosystems that provide green open spaces used by the city for biodiversity protection and recreation.
2. Water systems that cities use to tap the natural flow for water supply and waste disposal.
3. Climate and air systems that provide cities with the requirements for healthy life.
4. Other ecological services, including agricultural and forestry systems providing food and fibre for cities.

The challenge for urban planning is to reconcile these two agenda because "the brown functions of a city generally consume and degrade its green resources and processes, respectively, unless the city intervenes through processes such as urban planning and environmental management. The green, natural systems of a city have real limits and capacity issues associated with their use" (UN HABITAT Planning 40). Moreover, a substantial section of the population of these cities is poor, especially in the developing countries and

unable to provide themselves with adequate infrastructure and services or pay for these services when provided by the local government or private players (UN Millennium 23).

2.2 Sustainable Cities Programme

Consequently, the Sustainable Cities Programme (SCP) was launched in 1996 following the UN Habitat II Conference held in Istanbul to give a formal boost to the process of integrating the two agenda and also achieving social sustainability. The thrust of this programme was as under (UN HABITAT pars 1-8) –

- Broad-based stakeholder involvement in city development strategies.
- Participatory problem-solving through inclusive processes and pro-poor governance.
- Mobilisation of local resources and commitment.
- A framework for capacity development and support for institutions leading to better implementation.
- Mainstreaming environmental concerns in urban planning and management.
- An instrument for implementing UNEP's Agenda 21 mission at the city level, and the environmental component of the Habitat Agenda, the Declaration on Cities and other Human Settlements and the Millennium Declaration.

According to Mahadevia (Globalisation 29) " The SCP brings together all the stakeholders whose cooperation is required:

a) to clarify environmental issues

b) agree on joint strategies and coordinate action plans

c) implement technical support and capital investment programmes

d) institutionalise a continuing environmental planning and management routine."

Mahadevia (Globalisation 30) goes on to say that "the SCP is based on the development paradigm that recognises that:

i. cities make an important contribution to social and economic development at national and local levels

ii. cities are important engines of economic growth in developing countries

iii. cities absorb two thirds of the population growth in developing countries

iv. cities offer significant economies of scale in the provision of jobs, housing and services

v. cities are important centres of productivity and social advancement

Mahadevia also says that the SCP assumes that environmental degradation leads to the inability of cities to perform the above functions and so it lays stress on civic engagement to prevent this. However, according to Mahadevia, the rhetoric of civil society participation is actually used as a mask to hide the underlying thrust towards reliance on private initiatives and a lessening of the state's obligation to provide basic urban services at subsidised rates to the urban poor – "The post modernist agenda of including diverse perspectives in development process through involvement of civil society and environmental sustainability gets converted into withdrawal of welfare state and emergence of enterprise state" (Globalisation 31).

Not surprisingly even after more than a decade of trying to implement the SCP the important need to bridge the brown and green agenda in an equitable manner has not been fulfilled. Consequently the UN Habitat report quoted above has been forced to note - "in many parts of the world, urban planning systems have changed very little and are often contributors to urban problems rather than functioning as tools for human and environmental improvement" (Planning iv). The challenge, therefore, still remains of finding ways in which cities can integrate these two agenda and conserve the natural environment. This involves improving the human environment while simultaneously fulfilling the aspirations of the majority of poor inhabitants. Clearly there has to be a considerable amount of government support to make this possible even in developed countries where a greater proportion of citizens have the financial capacity to contribute to such a programme. In developing countries matters are compounded by the fact that the majority of residents are poor and unable to address either of the two agenda on their own without government help and this severely stresses the financial sustainability of urban local government institutions. This further exacerbates the conflict between the brown and green agenda. Thus, currently urban governance in most cities in India is financially, environmentally and socially stressed because (World Bank "Bridging the Gap" 35)-

- Capital Expenditure and Operation and Maintenance (O&M) costs are not recovered from user charges
- There is unsustainably high and inefficient energy consumption
- The transport infrastructure is inadequate and unsustainable
- The water supply and waste water management infrastructure is inadequate and has unsure sources and sinks.
- There is a failure to accommodate the ways of life of the majority of inhabitants who are poor, contributing to their social and spatial marginalization and resulting in social instability, injustice and unsustainability.

2.3 Shoring up Urban Local Body Finances

The international financial institutions concerned more with the financial sustainability of urban service provision are putting pressure on governments to reduce subsidies and improve tax and user fee collection. A related policy thrust is to stop grant funding and encourage urban local bodies to access the debt market. To make this possible the USAID has extended loans and grants to improve the capacity of urban local bodies to tap the commercial debt market through the Financial Institution Reform and Expansion (FIRE) project (Mahadevia "Sustainable Urban Development" 249). Apart from this USAID also sponsors technical assistance projects for improving the technical skills of urban local bodies. The National Institute of Urban Affairs has been designated as the nodal agency under this project by the Ministry of Urban Development of the Government of India and has the following mandate to support the GoI's efforts (NIUA para 3) –

i) in promoting decentralisation as an efficient mechanism for good urban management through implementation by the states of the 74th constitution amendment,

ii) capacity building of state level entities for development of commercially viable water and sanitation projects with market based financing,

iii) development and expansion of an efficient urban management training network in the country and

iv) in dissemination of reforms.

The focus of improving the own tax revenue of the urban local bodies is the property tax. Propery tax should ideally be the major source of revenue for municipal governments because it is a progressive tax that is borne more by the richer propertied sections than the poorer property less sections of the city (Bahl and Linn 7). However, in India typically collusion between property owners and assessors has led to non registration and undervaluation of properties, low tax rates and bad collection as mentioned in a study done by the National Institute of Public Finance and Policy (NIPFP 1). This study notes that the stress on better tax collection has been reiterated by the JNNURM, based on several studies that have pointed out the need to augment and rationalise the property tax system in particular and the property market in general (NIPFP 54). The JNNURM has stipulated thirteen mandatory reform conditionalities and ten optional ones for funding urban development projects. These conditionalities which have to be accomplished by the end of the mission period in 2012 are as follows (JNNURM http://jnnurm.nic.in/reforms.html) –

I. At the level of the Urban Local Bodies (ULB)

i. Governance is based on a digitised Management Information System and a Geographical Information System is in place to completely cover and register all the properties in a city,

ii. The Accounting system should be an Accrual based Double Entry one.

iii. Tax rates should be rationalised and property valuations raised to realistic levels from the present low ones with at least 85 per cent coverage and a collection efficiency of 90 per cent.

iv. There should be 100 per cent recovery of operation and maintenance costs for Water Supply, Sewerage and Solid Waste Management.

v. Funds should be earmarked from own revenue for provision of Services to the Urban Poor.

vi. The Urban Poor should be provided with Basic Services.

II. State Level Reforms

vii. Devolution of all functions and requisite functionaries and funds to ULBs as mandated under the 12th Schedule of the 74th Constitutional Amendment of 1992.

viii. District Planning Committees and Metropolitan Planning Committees in the case of metropolitan cities should be constituted by law.

ix. Devolution of the City Planning Function to the ULBs

x. Devolution of Water Supply and Sanitation Management to separate entities at the ULB level.

xi. Repeal of the Urban Land Ceiling Regulation Act and reform of Rent Control Laws.

xii. Rationalisation of Stamp Duties to 5 per cent of sale value of properties.

xiii. Enactment of Community Participation and Public Disclosure Laws.

III. Optional Reforms

xiv. Introduction of Property Title Certification System in ULBs.

xv. Revision of Building Bye Laws and streamlining of the approval process.

xvi. Making Rain Water Harvesting Mandatory.

xvii. Earmarking 25 per cent of developed land in all housing projects for economically weaker sections.

xviii. Simplification of Legal and Procedural framework for conversion of agricultural land for non-agricultural purposes.

xix. Introduction of a computerised process of registration of land and property.

xx. Making re-use and re-cycling of waste water mandatory.

xxi. Undertake administrative reforms to improve operational efficiency.

xxii. Undertake structural reforms to improve institutional efficiency.

xxiii. Encourage Public Private Participation.

The insistence of the JNNURM for financial independence of the municipal bodies is primarily to ensure that they have untied local funds for development. The 30 per cent share that the municipalities have to contribute to the JNNURM projects and also the repayment requirements of loans and bonds by these entities would be facilitated by a bouyant property tax regime.

A further aspect of this decentralisation and commercialisation of the operation of urban local bodies is the ringfencing of the WSS functions through the formation of separate water supply and sewerage boards. This is crucial because to be able to pay back the loans taken for implementing WSS projects there has to be a dedicated income source specifically for these projects. So by creating separate institutions the taxes and user fees can be increased and collected separately for WSS services. Williamson argues that while capital costs incurred in setting up water supply and sanitation infrastructure should not be charged to the users because of the public good nature of these services and the inability of the poor to bear this burden, the operation and maintenance (O&M) costs including the interest burden on any loan taken should be recovered and the basis for pricing of water services should be the long run marginal cost rather than the average cost (439). The logic is that a city develops its least cost water sources first and as the population increases it has to develop costlier and costlier sources and so charging the average cost of water services will lead to an underestimation of the costs of the new additional water services.

A study of several Indian cities based on this premise shows that many of them are underpricing their water services and so are not able to operate and maintain these services properly (Sridhar, Mathur and Nandy 22). Moreover, another study shows that in most cities the water taxes are based on the area or rent value of the property and in some cases on political considerations of affordability to all sections of the population and rarely on the actual O&M costs and metering of water supply (Sridhar & Mathur 357). The main problem is that there are institutional bottlenecks pertaining to existing systems of water supply, sewerage and landuse that prevent proper pricing and service delivery that can at the same time address the questions of affordability and equity for the poorer sections. Thus, there is a need for ensuring full public participation in the design, installation and O&M of such systems to make them sustainable and equitable (Sridhar 47).

However, a detailed study of the performance of the JNNURM across states shows that the conflicting pulls of creating infrastructure that serves the purpose of making a city modern and providing basic services to the poor have not been resolved. Consequently, the funds expended have not led to better services and neither have finances of the urban local bodies improved appreciably (Mahadevia "Branded and Renewed" 63).

2.4 Private Sector Participation

This financial reform of the urban local bodies also clears the way for the privatisation of these services and the initiation of Public-Private Partnership (PPP) projects in the infrastructure sectors and especially in WSS infrastructure and services. The Indian Government's definition of what constitutes a PPP is as follows (Planning Commission, 1) – "Public-Private Partnership (PPP) Project means a project based on a contract or concession agreement, between a Government or statutory entity on the one side and a private sector company on the other side, for delivering an infrastructure service on payment of usercharges" The arguments that are being advanced in favour of PPPs for the establishment and operation of infrastructure projects as detailed in an independent study report are (Dwivedi 21) –

1. PPPs are cheaper **:**The first major claim in favour of PPPs is that the projects implemented under this model provide a cheaper option for bringing in new private investments, thus allowing the governments to save money spent on infrastructure.
2. Private Corporations are more efficient: It is claimed that the major advantage of having PPPs in public projects is the superior efficiency that the private corporations bring with them in the design, construction and operation of the public services. It is argued that privatisation brings about greater efficiency in the operations, in order to save on project costs and to maximise the returns. The corollary to this argument is that efficiency would lead to cost savings, which in turn would lead to lower prices for the services delivered.
3. PPPs bring in Private Investments: One of the major claims supporting the PPP model is that, since such a model uses private financing sources, the public resources that would have been invested in the project are freed. These freed public resources can then be spent on other policy priorities of the government.
4. PPPs are In-Budget and On-Time: Efficient implementation results in projects being completed within the budget estimates and time schedule it is claimed.
5. Risk Transfer: Risk transfer is one of the key arguments favouring PPP projects. The main idea is that once the public and private sectors come together in a partnership to execute a project, some of the risks like commercial, financial, operational, construction and force majeure would be shared, enabling the public sector to pass on some of the risks to the private operator.
6. Division of Roles: The other operational argument in favour of PPPs that is closely linked with the risk-transfer argument is the suitable division of the roles between the public and the private sector. This means that the roles are assigned taking into consideration the strengths and weaknesses of both the sectors.

The international financial institutions have actively supported the use of PPPs in the urban water sector as evident from the World Bank's Country Strategy paper (World Bank CAS 9-12 15) - "Cross-cutting priority reforms where activities are already underway include - Restructuring of public sector institutions (including through capacity building and the strategic realignment of incentive structures and skills mixes) and the establishment of new institutions (including regulatory authorities, water users associations, river basin agencies, and **public-private partnerships**) …...(so as to ensure) Financial sustainability of resource management and service delivery through rational charges and tariffs and improved financial management, including removing distorting subsidies and moving towards user charges that reflect at least O&M costs".

There were, thus, upto November, 2009, 64 PPP projects in operation in the urban WSS sector in the country as tabulated in the above report (Dwivedi 101). However, Dwivedi (24) goes on to cite several independent studies, reports of the Comptroller and Auditor General of India and newspaper reports on the operation of these projects that show that they have belied all the tall claims that have been made above. In fact the PPPs have not only increased the costs to the Government and the users and failed to improve service quality but by protecting the private players from various risks have ensured super profits for them. As has been succinctly summarised by a researcher - "The international financial institutions, and national finance ministries - all public sector institutions sustained by public finance, act as a de facto international lobby group to protect PPPs and discourage direct state-funding of infrastructure. This propaganda support reflects a quiet shift that has taken place with international aid. Development banks and donors, led by the World Bank's International Finance Corporation (IFC), have channelled increasing amounts of aid into vehicles for investing in private companies only. The objectives have nothing to do with charity or solidarity. Sweden's Swedfund states: 'Our decisions regarding investments are based solely on business principles.' The UK's Commonwealth Development Corporation (CDC) reports: 'CDC's achievements in 2007 were impressive by any measure, outperforming the Morgan Stanley Emerging Markets Index by 20 per cent'." (Hall, xii).

Originally in the 1980s when PPPs were first mooted as a means of providing public services and later in the 1990s when they were said to have broader social goals apart from the purely economic, helping the poor was never part of the agenda (Clarke 3). However, by the late 1990s the negative consequences associated with PPPs, including corruption scandals and increasing poverty and inequality led to growing citizen opposition to these programmes . In the words of the Nobel Laureate economist Joseph Stiglitz, ''in contrast to what it was supposed to do, privatization has made matters so much worse that in many countries today privatization is jokingly referred to as 'briberization'''(Stiglitz 58). This led to international institutions like the World Bank changing tack and giving a pro-poor rationale to the PPPs by stating that ''private participation offers enormous potential to improve the efficiency of infrastructure services [and] extend their delivery to the poor'' ("Private Involvement" 1). Nevertheless despite conscious efforts on its part to ensure that PPP projects did include provision of public services to the poor also, the World Bank has been forced to admit in its World Development Report 2004 that " it would be wrong to conclude that government should give up and leave everything to the private sector (as PPP) is not without problems - especially in reaching poor people'' ("WDR 2004" 10). Studies have shown that in Latin America, PPPs have led to not only a fall in the coverage of WSS services especially among the poor but also a reduction in the ability of citizens and local governments to control the functioning of the PPP firms (Perry et al, 15, Crenzel and Forte, 26). The inescapable conclusion therefore is that PPPs have failed to solve the problem of lack of universal and adequate WSS service provision and the solution is in "coordinated action at different levels (subsidiarity principle), with public participation by all sectors (active citizenship), and especially engaging the most vulnerable such as women and children who compose the bulk of the world's poor." (Castro 767)

2.5 Relevance of Present Study

The complex socio-economic and environmental problems of urban development have been complicated further by the increasing trend towards privatisation of public services. These cannot be tackled without a "vision of putting the poor and marginalised urban sections at the centre of urban policy making" (Mahadevia "Sustainable Urban Development" 254). Mahadevia (254) also states that – " In India the issues that require immediate attention are:

i. Secure housing rights
ii. Provision and access to civic amenities and a clean, safe and healthy living environment for all,
iii. Adequate provision of access to public health facilities, basic education, safe drinking water and food security,
iv. Freedom from violence and intimidation on the basis of social identity,
v. Sustainable livelihoods and
vi. Adequate and appropriate provision of and access to social security programmes.

Mahadevia goes on to say that these concerns can be addressed in a macro development model in which the government plays a significant role in assuring equitable access to the marginalised poor through adequate public funding of development and by ensuring grassroots democracy and participation instead of through commercialisation of services.

Consequently, given these complexities of urban WSS provision it is imperative to do independent city specific studies. In recent times water supply and wastewater and stormwater disposal have become the most challenging aspects of urban planning due to huge increase in population, the corresponding increase in built up area at the cost of green spaces and natural drainages and the exponentially rising financial and environmental costs. Moreover, proper utilisation of scarce urban physical space requires the tackling of urban WSS problems. What follows is a situational analysis of Indore city in section 3. This is followed by a discussion of urban governance in Indore in section 4. Section 5 presents the status and impact of various urban development policies and section 6 analyses the financial sustainability of the Indore Municipal Corporation (IMC). The details of the proposed WSS projects are then presented with an analysis of their financial and social sustainability in section 6. A discussion of the alternatives to the present scenario for a more sustainable WSS regime for the city follows in section 7. Finally conclusions are drawn for the future.

3. Introduction to Indore

The demographic, historical, geographical and geohydrological characteristics of Indore city are described below in brief to contextualise the study.

3.1 Demography

The population dynamics of the district are given in Table 1 below. The decadal growth rate of population for the district as a whole over 1991-2001 was 38.7 per cent while that for the total planning area was higher at 42.8 per cent and for the municipal area slightly lower at 37.9 per cent. In the decade 2001-2011 the district population grew by 36.8 per cent and that for the municipal area by 30.2%. The average growth rate of the state as a whole in the decade 1991-2001 was 24.3 per cent and it declined to 20.3 per cent in 2001-2011 and the growth in urban population for the whole state in 2001-2011 was 25.7 per cent. This significant difference between the growth rates for Indore and the state as a whole indicates that rural to urban migration was taking place at a far greater pace in the city and more so in the peripheries of the planning area which are all villages which have been newly converted into urban areas. Not only Indore city itself but the other smaller towns in the district too have seen increased rural-urban migration. The growth rate of population in Indore in 2001-2011 is much greater than that for the whole of India for the same period which is 31.8 per cent (Census 2011). This means that the challenge for planning in Indore is that much greater. The female-male sex ratio in 2001 in Indore district was 912 while the density was 663 persons per sq km. The city population density is far higher at 15070 persons per sq km. The Indore

Development Plan 2021 does not disclose the methodology adopted for projecting the population growth into the future but the figures indicate an assumed average decadal growth rate of 40.7% which is much higher than those actually prevailing. The population density of Indore district in 2011 was 839 persons per sq km with a sex ratio of 924.

Table 1: Population Dynamics of Indore

Area	1991	2001	2011	2021
Indore District	1,777,685	2,465,827	3,372,3	4,695,921*
Indore Municipal Area	1,091,618	1,506,062	1,960,631	3,117,548*
Indore Planning Area 2021	1,189,797	1,698,474	2,534,685*	3,566,994*

* Projections, Source: Indore Development Plan 2021, Directorate of Town and Country Planning, M.P.

The Scheduled Caste population of Indore district was 388459 or 15.8 per cent and the Scheduled Tribe Population was 163872 or 6.6 per cent in 2001. The literacy rate in 2011 in the district of Indore was the highest in the state at 82.3 per cent with 89.2 per cent for males and 74.9 per cent for females. The literacy rate in the city was even higher at 87.4 per cent of which male and female literacy were 91.8 and 82.6 per cent respectively. The total working population in the district in 2001 was 890961 or 36.1 per cent. The ratio between female and male workers was 1:3. In urban areas other workers constituted 92.3 per cent of the total workers.

The Indore Development Plan 2021 estimates the population that was living in poverty pockets in 2001 to be 485585 or 30.4% of the total. However, a detailed city wide household survey carried out in 2006 (Water Aid 4) found that there were 604 poverty pocket clusters in Indore city with 176545 households or an estimated population of 8.8 lakhs if we conservatively assume an average household size of 5. This is close to 51% of the estimated population in 2006. Most of the dalit and almost all of the tribal population live in these poverty pockets. These people live mostly in hutments of less than 35 sq metre area (George et al 45). Thus, provision of services to these poverty pocket clusters, especially WSS services, is an important aspect of planning and implementation in the city. Consequently, this underestimation of the poverty pocket population seriously affects the viability of the planning process.

There is a considerable amount of migration into the city, especially among the poorer sections residing in poverty pockets. This also creates additional demands on the infrastructure. There is very little provision of WSS services for this migrant population. However, there are no reliable data regarding this important phenomenon that crucially impacts urban planning and development and it has not even been considered in drawing up the 2021 Development Plan. The adverse effect that lack of access toWSS services for the poor has on women in India has been noted in the literature (Joshi 62) and this is in evidence in Indore also.

3.2 History

The town of Indore first grew on the banks of the Saraswati river as a resting place between the two important pilgrimage destinations of Ujjain on the Malwa plateau and Omkareshwar on the banks of the Narmada river, which both have temples with Jyotirlingas of God Shiva. It was also a convenient halting place on the major north south route from Delhi to Rameshwaram. The Marathas made it a camping place during their campaigns against the Mughals in the north in 1713. Local landlords who were initially subservient to the Mughals, fearing attacks from the Marathas, shifted to the banks of the Saraswati river where they built a small fort on a hillock. There was a temple of the God Indreshwar there from which the town was initially called Indrapur and it later became Indore (Geddes 15). The Marathas siezed control of the Malwa region in 1733 and Malharrao Holkar became the

de facto ruler of Malwa by 1760. The British gained control of the region in 1818 and the capital was shifted to Indore from Maheshwar on the banks of the River Narmada. This was a significant development that over the past two centuries has led to the modern city of Indore.

The British initially collaborated with the Holkars to promote the cultivation of opium in the region for export to China. This was an extremely profitable trade for over a century and it attracted Marwari businessmen from Rajasthan to the city further increasing its trading importance by expanding the grain trade (George et al 14). Rail transport came to the city in 1875 further enhancing trade between the Malwa region and Bombay. The textile industry was also set up about the same time in 1871 providing an industrial base for the development of the region as a whole and the city in particular. Electricity came to the city in 1906. At the time of independence Indore had become the major industrial and commercial centre of the central Indian region. The process of industrialisation received a further boost after independence with special government policies and subsidies. Pithampur in Dhar district bordering on Indore is referred to as the Detroit of India with Firodia Enterprises, Larsen & Toubro, Eicher Motors, Hindustan Motors, Crompton Greaves and various steel and pump making industries. The Tatas, S. Kumars, Caparo Industries and Ranbaxy have large units in the Dewas industrial area nearby.

Processing of agricultural products like oil seeds and pulses is also a major activity in the city as its hinterland produces large quantities of both. The city acts as a transhipment hub between north and south for the road transport sector. It is also a major manufacturing and trading centre for ready made garments and pharmaceuticals. Finally the city is a major educational centre in Central India with several government and private engineering, medical and management colleges and coaching centres. Thus, Indore fulfils in every way the engine of growth characteristic of a city and deserves to be studied in detail for the sustainability of its water management.

Indore municipality was formed in 1870. Two reservoirs were constructed in Pipliyapala and Sirpur and piped water supply began in 1894. A pumphouse was established on the Bilaoli Tank in 1906 after electricity came to the city. The augmented water supply also allowed for the installing of flush latrines and the implementation of a sanitation plan. The first systematic plan of the city was drawn up in 1918 by the Scottish planner Patrick Geddes. This plan addressed the problem of open drains emptying untreated waste water into the nullahs and rivers (Geddes 165). Subsequently solid waste disposal for composting in farms was also tried (Howard 23). An underground sewerage scheme was implemented in the central areas of the city from 1936 onwards but the sewage was emptied into the rivers without treatment. A dam was built on the Gambhir river about 20 kms away along with a filtration plant on top of the Devdharam hillock near the city in 1939 to further augment the water supply of the city and this was the WSS position at the time of independence in 1947.

3.3 Physical Geography

The municipal area is 130.1 sq km and the urban planning area under the Indore 2021 Plan is 50469 hectares or 504.69 sq km. The district as a whole has an area of 3831 square kilometers situated on the southern edge of the Malwa plateau with the city more or less in the centre. The land slopes gently towards the north with the southern fringe constituting the Vindhya ranges. Most of the northern and central part of the district has a slope of less than 10 m per km while the southern part from the Vindhyas northwards has a slope of 10 – 20 m per km. The district mostly has medium black clayey soils except in the southern hilly fringe which has shallow black soils.

The maximum temperature is about 45^0C in summer and the minimum temperature about 7^0C in winter. The mean annual rainfall is 1000 mm and most of it comes in the months of June to September. Three quarters of the district including the city of Indore lies in the Chambal sub basin of the Ganga basin and the southern quarter lies in the Narmada basin. The main rivers draining the district in the north are Chambal, Gambhir, Khan and Shipra. The southern fringe of the district is drained by the river Narmada the main tributaries being Choral and Kanar. The southern hilly area is fairly forested with crown cover exceeding 40% and is constituted into Reserved Forests. These geographical features are shown in Fig 1 below.

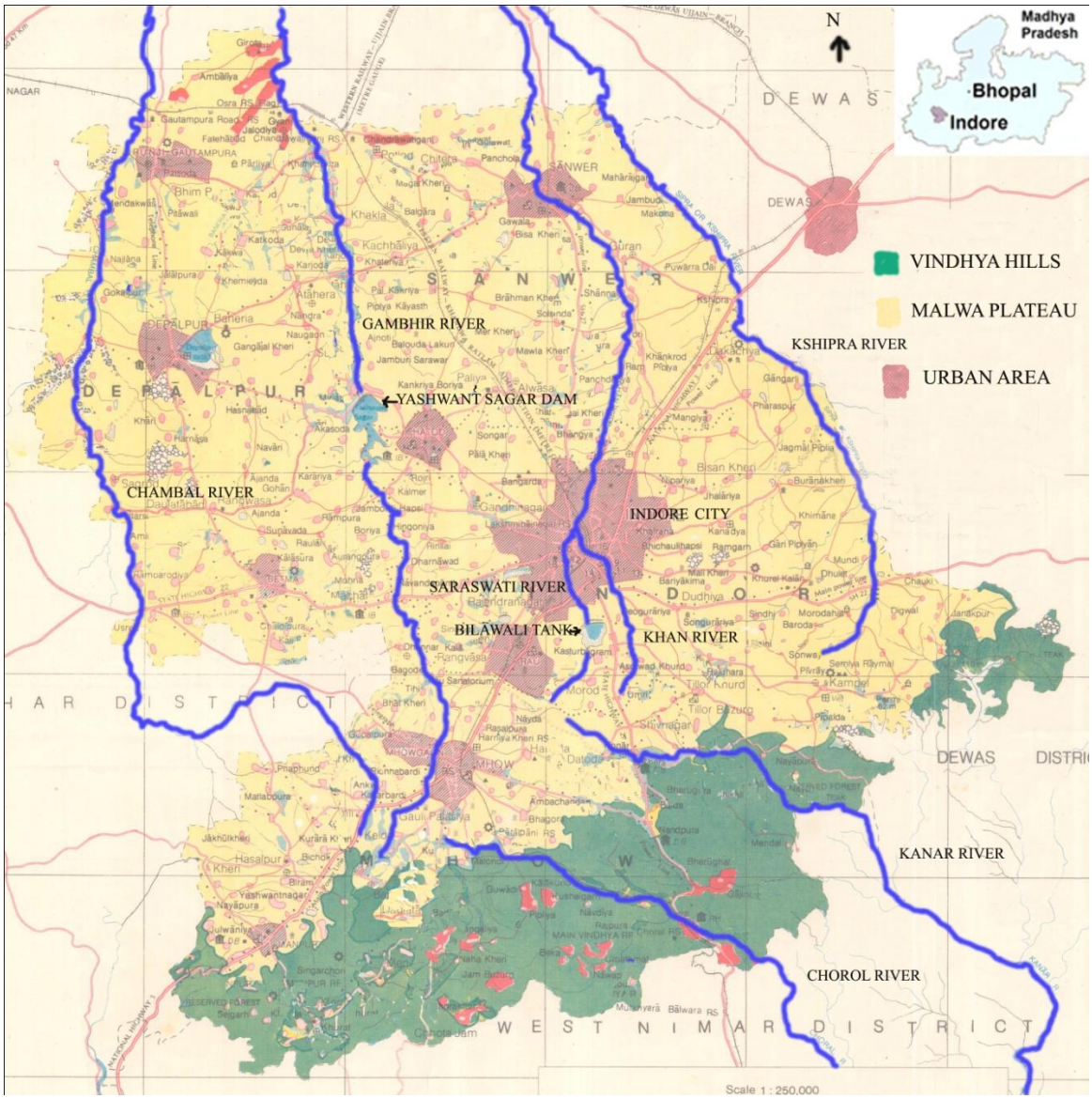

Fig. 1 : Map of Indore adapted from District Planning Map (NATMO, 1995)

3.4 Geohydrology

The predominant rocks in the district are the Deccan Traps. The water bearing properties of these rocks vary widely. The weathered zones and secondary porosities of the massive basalts and the minutely connected and partially filled vesicles of the vesicular basalts determine the occurrence, movement and storage of ground water. These are the potential aquifers. The run off is very high due to low permeabilities of basalts topped by clayey black cotton soils. Consequently the natural recharge to ground water aquifers is low.

There are some confined aquifers due to the alternating layers of the impermeable massive and productive vesicular basalts. At places, like Khajarana, Betma and Gautampura, semi-artesian conditions prevail (CGWB 3-7).

Exploratory drilling by the Central Ground Water Board shows that in the northern and north western part of the district the deeper and older trap units have recorded larger yields – 375 to 825 liters per minute (lpm) compared to the shallower and younger trappean units in the southern part of the district where yields are - 75 to 225 lpm. There are ten vesicular layers within a thickness of 218 m with individual layers of thickness from 3 to 20 m. The transmissivity values range between 127.7 m^2 /day to 149.6 m^2 /day. The vesicular zones occurring below a depth of 30 m have poor water yielding capacity. The thickness of the weathered formation encountered ranges between 6 and 30 m. The thickness of the water bearing zones is generally between 1 and 3 meters. However, a 14 m thick water bearing zone exists at Gautampura. The consequence of this hydrogeological situation is that natural water availability is low.

Ground water development in the district is high with two overexploited, one critical and one safe block. The withdrawal of ground water exceeds the natural recharge in the overexploited blocks in a normal monsoon year. "The total annual ground water recharge in the district is 598.97 Million Cubic Metre (MCM) out of which 29.95 MCM is treated as natural discharge during non-monsoon season, leaving a net annual ground water availability of 569.02 MCM. The existing ground water draft for irrigation is 569.43 MCM and the existing ground water draft for domestic and industrial requirement is 24.84 MCM making a total of 594.26 MCM for existing gross ground water draft for all uses. The stage of ground water development comes out to be 104%." (CGWB 9). The current domestic and industrial demand of Indore city is above 100 MCM. This effectively means that even after over-exploitation of groundwater the demand for water cannot be met and so water has to be brought in from other sources as will be discussed in the next section.

The Central Groundwater Authority (CGWA) has declared Indore a severely exploited area with regard to groundwater and directed the District Collector under the provisions of the Groundwater (Control and Regulation) Act 1992 to ban any further tubewell boring in the city of Indore (HT Live I 1). However, in the absence of adequate surface water supply obviously this ban has not been imposed and the number of tubewells continues to increase and now the static reserves of groundwater built up over thousands of years are being depleted. The situation is particularly grave in Indore city where a survey carried out by the Indore Municipal Corporation revealed that there were 51,000 tubewells in the municipal region in 2010 (Dainik Bhaskar 1). This had gone up from 13,400 recorded in 2004.

The CGWA has gone on to say that apart from natural recharge being low in the Indore area due to the underlying hardrock structure, the continuing construction activity has lowered green spaces resulting in a high level of run off which further aggravates the lack of recharge. The CGWA has recommended that a systematic plan for artificial recharge be drawn up and implemented. The annual availability of surface water in the district at 75% dependability is 871 (MCM) but most of it flows away as there is no attempt to recharge it into groundwater aquifers on a large scale.

4. Urban Governance in Indore

Indore was designated as a Municipal Corporation in 1956 after the formation of Madhya Pradesh and thereafter formal urban governance began. In the Holkar era the municipality was directly controlled by the rulers. The legal framework that has evolved for

the governance of cities in Madhya Pradesh consists of the following major legislations amongst many other acts and rules -

1. Madhya Pradesh Municipal Corporation Act 1956 and various Rules to go with it,
2. The Madhya Pradesh Nagar Tatha Gram Nivesh Act 1973 and various rules to go with it including the all important Madhya Pradesh Bhumi Vikas Rules, 1984.
3. The Madhya Pradesh Gandi Basti Kshetra (Sudhar Tatha Nirmulan) Adhiniyam, 1976.
4. The Madhya Pradesh Nagariya Kshetro ke Bhoomihin Vyakti (Pattadhriti Adhikaron Ka Pradan Kiya Jana) Adhiniyam, 1984.
5. The Madhya Pradesh Nagarpalika Mohalla Committe Rules 2009

These laws and rules and the institutions that have been set up under them are discussed briefly below -

4.1 Indore Municipal Corporation

The Indore Municipal Corporation (IMC) is the body set up under the Madhya Pradesh Municipal Corporation act to govern the city. The 74th Constitutional Amendment in 1993 made urban local governance much more democratic and all governance functions with regard to the city are since being undertaken by the IMC and its staff under the direction of the elected representatives. Presently there is also 50% reservation for women in the posts of councillors. The corporation has a mayor directly elected by the voters from the whole municipal area and councillors elected from 69 wards. The mayor who is the head of the corporation selects ten ward councillors to be members of the Mayor in Council (MIC) which is the executive body entrusted with the implementation of the work of the corporation. The proceedings of the meetings of the full Corporation are chaired by the Speaker who is elected from among the Councillors. The MIC has 10 members who oversee the work of the various departments of the corporation. There are also advisory committees for each department constituted from the other councillors. the MIC must have at least one scheduled caste or scheduled tribe member, one OBC member and one woman member. The most important advisory committee is the Municipal Accounts Committee constituted under Section 131-A of the Act which consists of seven members elected by the councillors by a system of proportional representation and secret ballot from among themselves and cannot have members from the MIC. The members of the committee also select a chairman from among themselves. The prime responsibility of the committee is to examine the audit report of the accounts of the corporation and ensure that the funds have been spent in accordance with the budget. The Commissioner is the chief executive officer of the corporation charged with the supervision of the day to day activities which is carried out by the paid staff.

The 12th Schedule of the Constitution mandates that the following eighteen functions and the necessary functionaries and funds will be devolved to urban local bodies -

1. Urban planning including town planning.
2. Regulation of land-use and construction of buildings.
3. Planning for economic and social development.
4. Roads and bridges.
5. Water supply for domestic, industrial and commercial purposes.
6. Public health, sanitation conservancy and solid waste management.

7. Fire services.
8. Urban forestry, protection of the environment and promotion of ecological aspects.
9. Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded.
10. Slum improvement and upgradation.
11. Urban poverty alleviation.
12. Provision of urban amenities and facilities such as parks, gardens, playgrounds.
13. Promotion of cultural, educational and aesthetic aspects.
14. Burials and burial grounds; cremations, cremation grounds and electric crematoriums.
15. Cattle pounds; prevention of cruelty to animals.
16. Vital statistics including registration of births and deaths.
17. Public amenities including street lighting, parking lots, bus stops and public conveniences.
18. Regulation of slaughter houses and tanneries.

The first function of urban planning has not been devolved to the IMC and it remains the prerogative of the Town Planning Department otherwise all the other functions are being performed by the IMC. Apart from this the IMC also regulates factories and trades within its limits and the sale of foods, drink, drugs and other dangerous substanaces.

4.2 Indore Development Authority

The Indore Development Authority (IDA) was constituted in 1975 under the Madhya Pradesh Nagar Tatha Gram Nivesh Act 1973 to implement the development plan of the city in coordination with the IMC. The IDA also has the task of developing new areas in the form of residential, commercial and public use schemes and then handing them over to the IMC for provision of WSS and other services. The first development plan in accordance with the provisions of the Town and Country Planning Act 1973 was drafted in 1975 and had a plan period upto 1991.The planning area was 21410 hectares and the plan was a fairly well designed one providing for balanced development of the city. A review of the implementation revealed that at the end of the planning period in 1991, 70.8% of the proposed development had taken place according to plan (DTCPGOMP 23). After that there were several attempts to prepare another draft plan with a planning period first upto 2005 and then upto 2011 but these were shot down by the M.P. High Court when citizens filed petitions against anomalies in them which violated the provisions of the Town and Country Planning Act. Finally a draft plan 2021 was notified in 2008, even though that too is mired in litigation.

The main problem is that much illegal development in violation of the development plan and various rules for building and colonisation has taken place in the city which has not been controlled by either the IMC or the IDA as they should have done under the provisions of the laws under which they have been constituted. Consequently there has been no planned development of the city since 1991 leading to the proliferation of illegal residential colonies which have encroached into the designated green areas and drainage areas. Currently there are 432 such illegal colonies according to the IMC Colony Cell records. These are creating problems in land use and WSS provision as these colonies have been developed without following the accepted rules of urban development of providing enough green spaces, roads

of adequate width and proper waste and storm water drainage and treatment. In most cases there is no planning in these colonies for commercial, transport, health and education services and these come up in an arbitrary manner.

The Mohalla Committe Rules were enacted in 2009 with the intention of further democratising the functioning of urban local bodies and especially in large cities like Indore where the wards are so big that it is difficult for the councillor to address all issues. Under these rules small Mohalla Committees of not less than 100 members can be formed and registered with the Urban Local Body for the purposes of governance within their area. However, these rules have not been implemented and so there are no formal Mohalla Committees in operation. Thus, there is a big gap between the IMC and the ordinary citizen and even more so those hailing from the poorer sections.

4.3 Poverty Pocket Governance

The law relating to the slums or poverty pockets as they have been termed here, is wholly against the poverty pocket dwellers. It provides powers to the government to declare an area as a poverty pocket and then order that the buildings within it be properly constructed according to laid down rules and the costs are to be borne by the poverty pocket dwellers. This totally ignores the stark fact that it is due to poverty that the poverty pocket dwellers live in such dwellings on marginal land. There is provision for poverty pocket clearance also and in such cases only meagre monetary compensation is provided for with no guarantee of rehabilitation. Thus, with the passage of time the number of poverty pockets have increased from 26 in 1951 to 183 in 1991 and 604 in 2006. Surveys conducted of the city and surrounding areas by various nongovernmental agencies found 637 poverty pockets (AME 34). These poverty pockets are mostly situated along the banks of the nullahs and rivers and in designated green spaces further complicating the already difficult storm and waste water drainage situation. Due to their location they are also prone to flooding and related public health hazards during the monsoons when the nullahs tend to overflow. There have been major floods in 2001, 2005 and 2009, the last being followed by a dengue epidemic which was exacerbated by prolonged waterlogging (TARU 21).

After enactment of the law for regularsing poverty pocket dwellings in 1984, lease tenure or pattas were given to poverty pocketdwellers providing them with some security. However, the pattas that were given to some poverty pocket dwellers in 1984 did not entitle them to secure title to the land on which they were residing but only the right to be rehabilitated in case of displacement. In tune with the general trend all over the country, in Indore too poverty pockets located in the central business districts on the river banks have been demolished and displaced to the outer limits of the city.

5. Development Programmes and their Impact

This section briefly describes the various development programmes for the two sectors that are the focus of development for the IMC – poverty pockets and WSS.

5.1 Poverty Pockets

There have been many poverty pocket development projects implemented in Indore -

1. Urban Community Development Programme (UCDP) – a UNICEF funded project implemented from 1983–87 by IMC.
2. Urban Basic Services Programme (UBSP) project, jointly funded by GoMP, GoI and UNICEF, implemented by the District Collectorate from 1987–94. The project

initiated a process of community organisation and promoted collective action and local leadership among poverty pocket dwellers.

3. Indore Habitat Improvement Project (IHIP), a Department for International Development of the United Kingdom (DFID) financed project, was implemented by the Indore Development Authority in 175 poverty pockets from 1990 to 1997. The programme provided piped sewage, asphalt roads, walkways, piped water supply or hand pumps and community toilets. It also created community centers in 119 poverty pockets, three health centers, and a children's complex. During the life of the IHIP project, remarkable results in community-managed education, economic support programs, social development, micro-credit, and preventive health activities were achieved. Some activities were sub-contracted to NGOs and local training institutes. Consequently, IHIP won the World Habitat Award (1993) and Agha Khan Award (1997) for innovative practices.
4. The Vakmiki Ambedkar Awaas Yojana (VAMBAY) has also been implemented and a few poverty pockets have been redeveloped in situ or after relocation.
5. Some preliminary work has been done under the Basic Services for the Urban Poor (BSUP) and the Integrated Housing and Slum Development Programme (IHSDP) of JNNURM and the Rajiv Awaas Yojana (RAY).

Nevertheless, due to lack of community involvement and wrong planning these investments have not fulfilled expectations. The IHIP project, which is the most important poverty pocket development initiative, consisted of the following important components –

1. Provision of piped water supply and underground sewerage to the poverty pockets and the use of the paved pathways for stormwater drainage.
2. It introduced the concept of poverty pocket networking wherein the sewers of the poverty pockets lying along the Khan and Saraswathi rivers would be connected to a main sewer running along the river. The sewers of the nearby residential areas would also be connected to this main sewer. The waste water would be carried to a waste water treatment plant at Kabitkheri instead of being emptied untreated into the rivers.
3. Creation of a strong community organisation in the poverty pockets that would monitor the operation and maintenace of the WSS infrastructure and a community centre was built in each poverty pocket to provide a place for community meetings.

However, due to the provision of inadequate water supply and the inability of the poor poverty pocketdwellers to install individual toilets this plan failed badly despite heavy investments (George et al 86). Sewerage systems need considerable water to work properly otherwise they get choked. Since piped water was not provided to the individual poverty pocket households as promised due to the general shortfall in water supply and its high cost, the poverty pocket networking plan never took off. This meant that the wastewater instead of going into the choked sewers was emptied onto the pavements which became drains adding to the unhygienic conditions especially in the monsoon season. There was never a serious attempt to involve NGOs in the mobilisation of the community and so as soon as the project came to an end in 1997 the community organisations became defunct.

There is an ongoing programme of displacement of poverty pockets along the Khan and Saraswati rivers in the central business districts to outlying areas where four storey buildings have been constructed under the VAMBAY and IHSDP. These buildings provide about 12 sq mtr rooms for each family with common toilets on each floor. There is no piped water supply in the buildings. There are only standpipes or handpumps on the ground. Often the standpipes do not supply water and this causes more problems. Those living on the third and fourth storeys obviously have a more difficult time carting water up to their apartments. The

apartments have been given to the occupants as a loan to be repayable over twenty years with instalments of Rs 500 a month. In most cases the occupants are defaulting on the loan instalments as their earnings are too meagre for them to be able to pay them regularly. Due to lack of water and the congestion the quality of life is very poor (Khan "Home Truths" 2).

5.2 Water Supply and Sanitation Situation

The water supply problem of the city assumed serious proportions in the 1970s as the local supplies from the Sirpur, Bilawali and Yashwant Sagar became inadequate. A plan to pump water up from the Narmada river 70 kms away and at a level 500 metres below was drawn up. This began to be implemented in 1978 and was completed in 1984. This first phase of the project proved inadequate in comparison to the rising demand and so a decade or so later in 1992 a second phase was implemented. A third phase has now been commissioned in 2010 partly funded by a loan from the Asian Development Bank (ADB). This loan will also fund improvements in sewerage and sanitation and solid waste management. The UN Habitat Asian Cities Programme and DFID too have provided grant and technical support for creation of poverty pocket infrastructure. Apart from this the Jawaharlal Nehru National Urban Renewal Mission has sanctioned several infrastructure projects in the water, wastewater and transportation sectors and in improvement of poverty pocket infrastructure that are under way.

The water supply, sewerage, stormwater drainage, solid waste collection and disposal and sanitation in Indore are all the responsibility of the IMC. There are separate departments for each of these functions. The water supply function has two departments one for the Narmada water supply and another for the locally sourced water supply. The Narmada water supply was initially being taken care of by the Public Health Engineering Department since its inception in the 1970s. Now it has been handed over to the IMC at the behest of the ADB which has stressed that the IMC must run the project and also arrange for the finances required for operation and maintenance and repayment of the loan through better collection of user fees and taxes. There are two members in council of the IMC in charge of water supply and sanitation and they are the chairpersons of the respective advisory committees. The solid waste collection function has now been outsourced to a private service provider.

The IDA has the responsibility only for developing new residential and other developmental infrastructure and then handing them over to the IMC for their operation and maintenance. Under the Urban Water Sector and Environment Improvement Project funded by the ADB loan a separate project implementation unit has been set up that after constructing the infrastructure will hand them over to the IMC for operation and maintenance. Thus, the IMC is responsible for collection of water and sanitation cesses and fees for defraying the expenses of providing the WSS services.

The total water supply for Indore according to the IMC is 285.5 million litres per day (MLD) from four sources and their actual respective contributions in 2012 are as follows (VMD 7) –

1. Three Phases of Narmada – 200 MLD
2. Yashwant Sagar Reservoir on Gambhir River – 40 MLD
3. Bilawli Tank – 3.5 MLD
4. Tubewells, Open Wells and Handpumps – 42 MLD

The water supply from the Sirpur Tank has been discontinued as it is now being conserved as a wetland for migratory birds. Surprisingly the IMC does not have any reliable data on the number of connections through which this water is distributed. An estimate

prepared by The Energy Research Institute in a study on Water Demand Management in Indore (TERI 21) gives the following rough data - House Connections 136, 730 – 155, 889, Commercial Connections 1,024 – 1,253, Industrial Connnections 1,320 – 1,354, Community Standposts 7,263 and Illegal Connections between 20 000 and 40 000. The study states that all these are likely to be underestimates.

5.3 The Asian Development Bank WSS Plan

The ADB has given a loan to implement the Narmada third phase in Indore for adding another 360 MLD to the water supply and the construction of the accompanying overhead tanks and distribution system. The ADB sanctions a loan only if the economic internal rate of return or EIRR and the financial internal rates of return or FIRR are suitable (ADB 16). The EIRR reflects the economic returns from the project to the people of Indore as a whole while the FIRR reflects the financial returns to the IMC. A project should be chosen from a menu of options by comparing their EIRR and selecting the one with the highest EIRR. Subsequently the FIRR of this selected project should be checked to see whether it is financially viable also. This is because in calculating EIRR many non-tangible benefits are also expressed in economic prices for quantification but in reality they do not contribute to the financial cash flows. The ADB discarded the groundwater option altogether by stating that the area is semi-arid and natural recharge is not assured without exploring the possibilities of artificial recharge of storm water and the treatment and reuse of waste water. It then considered only the augmentation of water supply from the Narmada. So only different options within surface systems were evaluated.

For the calculation of the EIRR a sample contingent valuation survey was conducted among the citizens to quantify the non-monetary benefits of getting a good supply of water defined as – 100 lpcd for in house connections and 75 lpcd for standposts. The respondents were asked to compare the benefits of the enhanced water supply with the prevailing dismal scenario which would soon lead to a water crisis and jeopardise their immediate household existence as well as the continuance of Indore. The EIRR for Indore came out to be a healthy 16.5% (ADB 45). Consequently the loan for the development of the third phase of Narmad supply was sanctioned.

The sewerage and storm water drainage augmentation plan funded by the ADB involves the construction of a primary network of 187.4 kms at a cost of Rs 442 crores of which 136.07 kms have been completed but since it is still incomplete it has not been commissioned. A secondary network of 265 kms is also planned but work has not started on this yet. Two sewerage treatment plants of total capacity 245 MLD are planned of which one is ready but due to the fact that the sewerage system is not yet working to full capacity this plant is treating only 78 MLD of sewage. (Khan S "Simplex" 2).

The ADB has also calculated that the combined enhanced water supply and sanitation charges will be within 4-5% of household expenses and so has deemed them to be affordable (ADB 52). For this the monthly charge was assumed to be cumulatively Rs 125 per household in 2004 and a multiplier of 1.1 at 10 per cent annual inflation rate was used.

5.4 Assessment of Water Supply services in Indore

The total water supply claimed by the IMC of 285.5 MLD requires some critical analysis to verify its authenticity. The first two phases of the Narmada River Supply are each of installed capacity of 90 MLD for a total of 180 MLD. At the behest of the ADB meters were installed on these two phases in December 2008 to do a water audit (Khan "Unquiet Flows the Narmada" 4). As a consequence of this audit it was found that 8 MLD are lost in pumping the water from the intake well upto the filtration plant. 55 MLD more is lost or is

unaccounted for in the transit of the filtered water by pumping over a distance of 20 kilometers and a height of 600 meters to the Backpressure Tank at Wanchoo Point. Thereafter as the water flows through gravity over a distance of 50 kms to the city of Indore and then through the distribution networks, another 31 MLD is lost or is unaccounted for (HT Live II 3). Thus, the actual accounted for supply to households is only 86 MLD. This implies a huge loss due to technical inefficiencies like bad maintenance and out and out theft.

The new third phase built with the ADB loan has not been metered yet but assuming a nominal 10% technical loss because it is a new pipeline and a similar 10% distribution loss, the volume of water available to households from the third phase is 72 MLD instead of the installed capacity of 90 MLD. So the total Narmada water supply is actually 158 MLD against an installed capacity of 270 MLD implying a huge loss of 41.5 per cent. Similarly the supply from Yashwant Sagar is actually 40 MLD against the installed capacity of 70 MLD again implying a large loss of 42.9 per cent (AME 48). However, even this level of supply results in the reservoir level going down by the first week of May and thereafter there is less supply during the crucial summer period. The contribution from the Bilawli Tank of 3.5 MLD against an installed capacity of 9 MLD can be taken as given but here too the supply drops from the first week of May due to the reservoir drying up. The number of operational IMC tubewell borings is 3896. Given the shortfall in IMC surface water supply the figure of 42 MLD is likely to be an underestimate for groundwater supply from these borewells, wells and handpumps but in the absence of other data this value has to be accepted. Like in the case of the Yashwant Sagar and Bilawli supply, the tubewell supply too goes down in summer as some wells dry up. So the actual water supply is only 243.5 MLD and this reduces to about 215 MLD in the peak summer months when tanker supply has to be provided. The piped water supply which covers 54 per cent of the population comes only from the Narmada, Yashwant Sagar and Bilawli tanks and amounts to 201.5 MLD of which the bulk consumers are given about 21 MLD. The tubewell, open well, standpipe and tanker supply of 42 MLD is provided mainly to the poverty pockets. This difference between the installed capacity and the actual supply due to large losses is shown below in Table 2.

Table 2: Difference between Installed Capacity and Actual Water Supply of IMC 2011

Sl. No.	Source	Installed Capacity (MLD)	Loss (MLD)	Actual Supply (MLD)	Proportion of Loss (%)
1.	Narmada	270	112	158	41.5
2.	Yashwant Sagar	70	30	40	42.9
3.	Bilawli Tank	9	5.5	3.5	61.1
4.	Groundwater	42	0	42	0.0
	Total	**391**	**147.5**	**243.5**	**37.7**

Source: Author's calculations from IMC data

The Census 2011 population of Indore Municipal Area is 1,960,631. Thus, the average water supply provided by the IMC to all households in litres per capita per day (lpcd) is 113.5 as opposed to the norm of 135 lpcd as given in the government guidelines (MP Govt 143). If we consider only the 54 per cent of the population who are getting piped water supply then this figure is 170.3 lpcd for them whereas the rest of the population mostly in the poverty pockets are getting only 46.6 lpcd. Thus, there is a huge difference between the richer and poorer sections of the populace as regards access to water. However, in the absence of metering it is not possible to know what is the actual supply at the household level. These results have been tabulated in Table 3 below.

Table 3 : Water Supply by Indore Municipal Corporation 2011

Sl. No.	Mode of Water Supply	Population	Household Water Supply (MLD)	Supply Per Capita (lpcd)
1.	Piped Water Supply	1058741	180.5	170.3
2.	Supply by Tankers, tubewells, open wells, standpipes and handpumps	901890	42.0	46.6
3.	Total Water Supply	1960631	222.5	113.5

Source: Author's calculations from IMC and Census 2011 data

The TERI study mentioned earlier uses some of the rough data provided by the IMC, in the absence of metering and a proper inventory of the distribution system, to calculate an Infrastructure Leakage Index (ILI) of 404.3 for the IMC water supply (TERI 67). This index is the ratio between the actual water losses taking place in the system to the minimum unavoidable water losses in a water supply system and is a measure of the efficiency of the system. Obviously the lower its value the better it is and it should ideally be between 2 and 6. The extremely high value of the ILI for IMC is an added proof of the severe inefficiency of the system. The values for water availability used for this calculation are much higher than those actually prevailing that have been used in the analysis here and so the actual ILI is even higher indicating a higher inefficiency. Despite a detailed study of water and associated energy demand having been done, there is still no effort on the part of the IMC to reduce losses in the water supply system which occur mainly due to old and decrepit pipes in both the trunk lines upto the Bijalpur distribution station in Indore and after that in the city distribution system.

There are some serious consequences of this wrong planning and even worse management of water supply. The draft of groundwater by private sources both for domestic use and for commercial supply has gone up tremendously. There is no systematic survey being carried out to enumerate the number of tubewells in the IMC planning area and there total water withdrawal. There are over a thousand residential colonies in the city, both legal and illegal, with on an average about 200 houses each and most of the houses have tubewells to supplement the Narmada water supply which is inadequate even where it is available because there are losses in the last mile supply which cannot be estimated due to lack of metering in water supply. The newer private residential colonies for affluent people coming up on the periphery in the expanded planning area will all rely on groundwater for their water supply and this will further aggravate the situation.

Even though there are rules in place that mandate colonisers to recharge stormwater and treat and reuse waste water these are not implemented (Khan "Bored To Death" 2). There is a water recharge cell in the IMC and it also collects a cess for water recharge and plantation activity. The potential for recharge at 75 per cent of the average annual precipitation of 1000 mm in the IMC area of 130.1 sq km is 268 MLD which is more than the current actual supply by the IMC. The recharge potential for the proposed urban planning area of 505 sq km in the Indore Development Plan 2021 is 1038 MLD which can easily cater for the increased water needs. Thus, if proper harvesting of the precipitation is done using a combination of ground and surface water techniques then there will not be any need for Narmada water supply at all. Instead even the mandatory 14% green area that is required within the planning area too has not been retained due to massive illegal construction of residential colonies in the areas stipulated as Green belt in the Town Plan of 1991.

The Slum Environment and Sanitation Initiative (SESI) which is a collaborative project funded and technically supported by Water Aid India and UNHABITAT is being

implemented in around a 1000 households in 17 poverty pockets of Indore (Water Aid 1). Under this programme piped water and pit latrines are to be provided to the poverty pocketdwellers. Due to the limited availability of water in poverty pocket areas, supply has not been maintained and so both water supply and sanitation are severely constrained in the project poverty pockets despite the implementation of the project. The project found in a survey conducted in 2006 that 72 per cent of poverty pocket households in Indore did not have access to piped water supply from the IMC and they have to depend on standpipes, public borewells or wells and 4.7 per cent from among these do not have access to even safe water sources. Even the 28 per cent that had access to piped water supply complained of irregular and inadequate supply of about half an hour every alternate day. And even among these 20 per cent said that these taps are completely dry and they had to rely on standposts instead (Water Aid 7). This leads to a loss of work hours for fetching water and also because of affliction with water borne diseases due to lack of sanitation. This affects women more because of the patriarchal gender division of labour which puts the responsibility for home care work on women.

The sewerage, storm water and solid waste management systems in Indore are in total disarray. There is a sewerage system from 1931 in some parts of the city which has been augmented partly later and at it covers only 35 per cent of the present municipal area. This system is leaking heavily due to broken pipes and it contaminates the groundwater and sometimes even the water supply which too is being done through pipes that are broken in many places. Mostly the wastewater is released into the natural drainages which are unlined nalas of about 200 kms in length and these lead to the Khan and Saraswati rivers which too have become stinking Nalas. The BOD level of the Khan river in the stretch downstream of Indore to its confluence with the Shipra river is 65 – 120 mg/litre (CPCB 1) against the norm of 3 mg/litre for open clear water sources. This means that in Indore city itself the water in the nullahs have much higher BOD. There is no storm water drainage in the city and many of the smaller natural drainages have been built up and this obstructs the flow of storm water which collects on the roads leading to severe water logging in the monsoons.

The ADB loan and the JNNURM grants together have provided for capital investments in providing a city wide sewerage system, stormwater drains, sewage treatment plants, solid waste collection and an incinerator and land fill. The solid waste collection is only about 60% of the total waste generated which is about 1000 metric tonnes daily. The IMC has adopted a solid waste management plan that involves door to door waste collection, construction of intermediate transfer points, construction of landfill sites and an incinerator at the Dev Guradiya trenching ground (HT "Pollution on rise" 3). However, none of this has materialised yet. The solid waste collection has been outsourced to a private party which is neither collecting the waste properly nor is it managing the trenching ground in a proper manner as wastes are being incinerated in the open.

6. Analysis of Finances of Indore Municipal Corporation

The Municipality of Indore had limited financial resources in the princely era as property taxes were not levied because this required an extensive bureaucracy. The Holkars gave grants for the development of Indore from their other revenue income. Even octroi and transit tax revenue was limited as the British refused to pay these taxes on their own goods trade. Thus, from 1956 onwards, once the IMC came into being, not only did the city of Indore raise more funds on its own through property and other taxes but it also received large amounts of government funds for various developmental activities and this continues at present as will become clear from the analysis of the corporation budgets that follow. Since

octroi hampers free movement of goods and trade, this has been removed and instead the state government recompenses the corporation with an annual grant.

The major hurdle in urban development in India is the lack of financing due to the inability of urban local bodies to mobilise resources (Mathur & Ray 1). This is especially so in the case of water resource management since water supply and wastewater disposal infrastructure are costly to set up and maintain. With the huge increase in city sizes these costs have gone up exponentially, badly straining public finances. The World Bank, consequently, categorically states that urban local bodies must become financially sustainable following global best practice in the water supply and sanitation sector wherein such financially sustainable service providers "recover operation and maintenance costs and ideally capital costs, from user charges, rather than from taxes" (World Bank 16). The Government of India also is pressing for financial sustainability following the lead of the World Bank in order to reduce subsidies and achieve fiscal prudence. Thus, it is necessary to study the finances of the IMC to find out the situation prevailing in this regard and the possibilities of achieving such financial sustainability while maintaining a high level of service provision to all sections of society and also ensuring environmental sustainability.

The annual budgets of the IMC for the five years from 2006-07 to 2010-2011 have been analysed here with the tables showing the actual expenditures have been given in the text. The tables showing the budget estimates have been given in the Annexure at the end as they do not figure in the analysis except to compare the shortfall between the estimates and actual finances. The funds for implementing JNNURM projects began to be available from the financial year 2006-07 onwards for a period of five years in the first phase. The Asian Development Bank funded Water Supply and Urban Services Improvment Project too began to be implemented in earnest from that year and was initially to be completed in five years. This is why the five year period from 2006-7 to 2010-11 has been chosen.

6.1 Analysis of Total Actual Receipts and Expenditures

Table 4: IMC Actual Receipts and Expenditures 2006-07 to 2010-11

Item	2006-07	2007-08	2008-09	2009-10	2010-11
Receipts (Rs Lakhs)	32953.22	46463.60	56874.66	66025.53	64231.69
Per Capita Receipts (Rs)	1851.31	2545.93	3041.43	3447.81	3277.13
Nominal Growth Rate (%)		41.00	22.41	16.09	-2.72
Annual Inflation Rate (%)		3.9	4.3	6.4	8.3
Real Growth Rate (%)		35.70	17.36	9.11	-10.17
Expenditures (Rs Lakhs)	33221.72	46800.70	56829.73	64711.27	62672.75
Per Capita Expenditures (Rs)	1866.39	2564.44	3039.02	3379.18	3197.59
Nominal Growth Rate (%)		40.87	21.43	13.87	-3.15
Real Growth Rate (%)		35.59	16.42	7.02	-10.57
Transfer to Reserves (Rs Lakhs)	1065.66	1252.76	1459.33	2262.17	2235.24
Deficit (Rs Lakhs)	-1334.13	-1590.53	-1414.40	-947.91	-676.30
Fiscal Deficit (Rs Lakhs)	-3208.57	-9990.77	-11902.36	-9799.59	-4791.62
Fiscal Deficit/ Non-Debt Income (%)	10.69	27.14	26.49	17.85	8.28

Source: IMC Budgets 2006-07 to 2010-11

There is a disturbing falling trend in the nominal growth rates of both receipts and expenditures from a high of 41.00 per cent in 2006-07 to -2.72 per cent in 2010-11. The real growth rates after adjusting for inflation are much lower. This lack of growth in IMC finances is a matter of concern. Each year 5 per cent of the revenue receipts are transferred to capital

reserves to provide for emergencies and shortfalls in capital receipts. After accounting for this there is an overall deficit in the budget. The deficit amount has gone down from Rs 13.34 crores in the year 2006-07 and stood at Rs 6.76 crores in 2010-11. The fiscal deficit is the difference between the sum of the revenue and capital expenditure and the sum of the revenue and grant receipts. The fiscal deficit is considerably higher and has gone up continuously from Rs 32.09 crores in 2006-07 to Rs 47.92 crores in 2010-11.

An important indicator of financial sustainability is the ratio of the fiscal deficit to the sum of the revenue and grant receipts or the non debt receipts. Generally for any governing institution at the national or sub-national level it should be in the 10 – 15% range to balance the needs of infrastructure development, the provision of services and the maintenance of sustainable finances (CAG 24). It can be higher at the national level because the national government has greater resource mobilisation powers and it should be lower at the municipal level. The estimated ratio rises from 10.69 per cent in 2006-07 to the highest 27.14 per cent in 2007-08 and then declines continuously to 8.28 per cent in 2010-11. The lower ratios in 2009-10 and 2010-11 are because of the high amounts of grants received under the JNNURM which are a temporary source that will be exhausted in 2012. Thus, the trend in this ratio does not indicate sustainability of finances.

6.2 Analysis of Actual Revenue Income and Expenditure

Table 5 : IMC Actual Revenue Income and Expenditure 2006-07 to 2010-11

Item	2006-07	2007-08	2008-09	2009-10	2010-11
Revenue Receipts (Rs Lakhs)	21313.15	25055.17	29186.63	45243.31	44704.77
Revenue Receipts per capita (Rs)	1197.37	1372.89	1560.78	2362.57	2280.86
Nominal Growth Rate (%)		17.56	16.49	55.01	-1.19
Real Growth Rate (%)		13.14	11.69	45.69	-8.76
Revenue Expenditure (Rs Lakhs)	16152.92	18835.24	16365.06	28857.54	28421.62
Revenue Expenditure per capita (Rs)	907.47	1032.07	875.14	1506.92	1450.08
Nominal Growth Rate (%)		16.61	-13.11	76.34	-1.51
Real Growth Rate (%)		12.23	-16.70	65.73	-9.06
Revenus Surplus (Rs Lakhs)	5160.23	6219.94	12821.56	16385.77	16283.15
Revenue Surplus/Revenue Receipts (%)	24.21	24.82	43.93	36.22	36.42

Source: IMC Budgets 2006-07 to 2010-11

The per capita revenue receipts in Table 5 go up from Rs 1197.37 in 2006-07 to Rs 2280.86 in 2010-11. While the per capita revenue expenditure goes up from Rs 907.47 in 2006-07 to 1506.92 in 2009-10 and then drops to 1450.08 in 2010-11. The revenue receipts have gone up substantially from 2008-09 onwards due to better collection of taxes, especially property taxes, under pressure from the ADB to improve the finances. The average per capita revenue expenditure for Tier I Indian cities in 2007-08 was Rs 3450 (MGI 63). Thus, Indore, even despite 15 per cent compound annual growth rate of revenue expenditure over the five years under consideration, is still way below the Indian average. The average revenue expenditure on urban services in Indian cities is itself only 2% of that in the United Kingdom, 9% of that in South Africa and 13% of that in China (MGI 62). This clearly shows that the revenue expenditures in Indore are woefully inadequate. The trend in revenue surplus is a rising one from 24.21 per cent of revenue receipts in 2006-07 to 36.42 per cent in 2010-11 with a peak of 43.93 per cent in 2008-09. However, given the low level of revenue expenditure as compared to what is required for providing adequate services, this surplus is a contrived one. The real and nominal growth rates of revenue receipts and expenditure were both negative in 2010-11. This too does not bode well for the sustainability of IMC finances.

6.3 Analysis of Actual Capital Income and Expenditure

Table 6 : IMC Actual Capital Income and Expenditure 2006-07 to 2010-11

Capital Receipts (Rs Lakhs)	Loans	2940.10	9653.00	11947.29	11113.85	6350.56
	Grants	8699.97	11755.43	15740.74	9668.37	13176.36
	Total	11640.07	21408.43	27688.03	20782.22	19526.92
	Prop. Loans (%)	25.26	45.09	43.15	53.48	32.52
Capital Receipts per Capita (Rs)		653.94	1173.04	1480.64	1085.23	996.27
Nominal Growth Rate (%)			83.92	29.33	-24.94	-6.04
Real Growth Rate (%)			77.01	24.00	-29.46	-13.24
Capital Expenditure (Rs Lakhs)	Loans	1175.80	1140.70	2001.44	1519.90	2007.29
	Assets	15893.00	26824.76	38463.23	34333.83	32243.84
	Total	17068.80	27965.46	40464.67	35853.73	34251.13
Capital Expenditure per capita (Rs)		958.92	1532.37	2163.89	1872.26	1747.51
Nominal Growth Rate (%)			63.84	44.69	-11.39	-4.47
Real Growth Rate (%)			57.69	38.73	-16.72	-11.79
Capital Deficit (Rs Lakhs)		-5428.70	-6557.70	-12776.64	-15071.51	-14724.21
Capital Receipts/Revenue Receipts (%)		54.61	85.44	94.87	45.93	43.68
Interest Payments (Rs Lakhs)		782.60	862.47	206.56	206.55	1205.16
Debt Service Ratio (Interest + Principle Payments/ Revenue Expenditure) (%)		12.12	10.64	13.49	5.98	7.06

Source: IMC Budgets 2006-07 to 2010-11

Capital receipts consist of loans taken from banks and from the ADB, funds raised through debt bonds and grants from the Central Government and State Government for JNNURM projects and for other purposes. The proportion of loans to total capital receipts, shown in Table 6, increases from 25.26 per cent in 2006-07 to 53.48 per cent in 2008-09 and then drops to 32.52 per cent in 2010-11. The per capita capital receipts go up from Rs 653.94 in 2006-07 to Rs 1480.64 in 2008-09 and then drops over the next two years to Rs 996.27 in 2010-11. The per capita capital expenditure goes up from Rs 958.92 in 2006-07 to Rs 2163.89 in 2008-09 before dropping over the next two years to Rs 1747.51 in 2010-11. The average per capita capital expenditure for Indian Tier 1 cities in 2007-08 was Rs 2800 (MGI 63). Thus, despite the increased contributions from ADB and JNNURM the average per capita capital expenditure was still substantially less in Indore. This will decline further from 2013 once the ADB and JNNURM contributions cease in 2012. Once again the average capital expenditure on urban services in Indian cities is itself very low at 4 per cent of that in the United Kingdom, 13 per cent of that in South Africa and 15 per cent of that in China (MGI 62). So the average per capital Capital Expenditure in Indore is very inadequate.

Another crucial indicator is the ratio of capital receipts to revenue receipts which is the goes up from 54.61 per cent in 2006-07 to the highest of 94.87 per cent in 2008-09 and then drops drastically over the next two years to 43.68 per cent in 2010-11. This means that there is a heavy dependence on grants and loans for infrastructure development and even after that the capital deficit exceeds the revenue surplus by a big amount because the captial expenditures are very high. The Debt Service Ratio, which is the ratio of the sum of the principle cum interest payments of loans to the revenue expenditure, was 12.12 per cent in 2006-07 and rose to a high of 13.49 per cent in 2008-09 before falling to 7.06 per cent in 2010-11. Though the debt service ratio is currenly manageable, the ADB loan repayments will increase from 2015 onwards to Rs 60 crores annually while the revenue expenditures are likely to be only about Rs 300 crores leading to a debt service burden of 20 per cent in future.

6.4 Shortfall from Budget Estimates of Revenue and Capital Income and Expenditure

Table 7 : Shortfall from Budget Estimates (B.E.) of Finances of IMC 2006-07 to 2010-11

Items	2006-07	2007-08	2008-09	2009-10	2010-11
B. E. of Revenue Receipts (Rs Lakhs)	36233.39	37327.75	47574.97	62927.31	74977.35
Actual Revenue Receipts (Rs Lakhs)	21313.15	25055.17	29186.63	45243.31	44704.77
Shortfall from Estimates (%)	41.18	32.88	38.65	28.10	40.38
B. E. of Revenue Expenditures (Rs Lakhs)	27654.07	26602.77	29406.40	38504.34	52142.94
Actual Revenue Expenditure (Rs Lakhs)	16152.92	18835.24	16365.06	28857.54	28421.62
Shortfall from Estimates (%)	41.59	29.20	44.35	25.05	45.49
B. E. of Capital Receipts (Rs Lakhs)	36085.16	48839.54	61948.71	71127.01	76732.03
Actual Capital Receipts (Rs Lakhs)	11640.09	21408.43	27688.03	20782.22	19526.92
Shortfall from Estimates (%)	67.74	56.17	55.30	70.78	74.55
B. E. of Capital Expenditures (Rs Lakhs)	45962.88	60360.24	80612.61	95835.50	99570.60
Actual Capital Expenditure (Rs Lakhs)	17068.87	27965.46	40464.67	35853.73	34251.13
Shortfall from Estimates (%)	62.86	53.67	49.80	62.59	65.60

Source: IMC Budgets 2006-07 to 2010-11

The shortfall between budget estimates and actuals shown in Table 7 in the case of revenue receipts is highest at 41.18 per cent in 2006-07, the lowest 28.10 per cent in 2009-10 and a fairly high 40.38 per cent in 2010-11. The shortfall in revenue expenditures is the highest 45.49 per cent in 2010-11 and the lowest 25.05 per cent in 2009-10. The shortfall in capital receipts are above 50 per cent in all the years under consideration being the highest in 2010-11 at 74.55 per cent. This has had a negative effect on the actual capital expenditure. Since the repayment of loans has more or less to be kept on track to avoid a downgrading of the credit rating of the IMC, this failure to mobilise capital receipts through loans and grants in accordance with the estimates has meant that the actual capital expenditure in the creation of infrastructure has fallen short by over 50% from the budget estimates. The highest shortfall being 65.60 per cent in 2010-11.

There is anyway a budgeted capital deficit that exceeds the revenue surplus resulting in a budgeted overall deficit which is on an average around 4 per cent of total receipts. There is no indication as to how this budget deficit is to be made up. This deficit remains even in the actual finances with the proportion being more or less the same. This hampers the ability of the IMC to pay back the loans it has taken and to undertake adequate capital expenditure on all its projects. The shortfall in capital expenditure was 62.57 per cent in poverty pocket development in 2010-11. This is an important programme funded by JNNURM and also DFID and yet it has suffered from under implementation. This is a serious cause for concern because given the financial crisis facing the IMC, there is little likelihood of it being able to devote resoures for poverty pocket development from its own revenues. The IMC will thus have very little resources to even maintain the present level of services let alone cater for growth and quality improvement in future.

The deficits keep on accumulating over the years and eventually have to be made up by grants from the state government. A comparative study of the municipal finances of the five cities of Ahmedabad, Pune, Mumbai, Chennai and Bengaluru reveals that while there is a shortfall of the actual receipts and expenditures from the budgeted estimates in these cities also it is generally in the range of 4 to 50 per cent for revenue receipts and 13 to 55 per cent for revenue expenditures (Sekhar and Bidarkar 1202). The city of Pune with the lowest shortfall is also the one with a good own revenue mobilisation. Thus, prima facie, from an analysis of the overall budget it looks as if the IMC is nowhere near achieving financial sustainability in the terms set out by the World Bank as mentioned earlier.

6.5 Categorywise Revenue Receipts

More insight can be gained into the financial status of the IMC by studying the category wise breakup of the revenue receipts and expenditures and capital receipts and expenditures which now follow.

Table 8 : IMC Actual Category wise Revenue Receipts 2006-07 to 2010-11

Category	2006-07		2007-08		2008-09		2009-10		2010-11	
	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)
Property Tax	2335.66	10.96	1124	4.49	2064.49	7.07	2630.52	5.81	4411.49	9.87
Water Tax	1951.57	9.16	4311.00	17.21	2798.15	9.59	2450.07	5.42	4361.11	9.76
Drainage & Cleanliness Tax	2295.41	10.77	1050.72	4.19	2188.44	7.50	2612.21	5.77	3277.37	7.33
Water Recharge & Plantation Tax	582.27	2.73	357.56	1.43	326.97	1.12	547.44	1.21	359.61	0.80
Octroi Compensation	6484.13	30.42	6835.56	27.28	11500.00	39.40	21719.00	48.00	19769.5	44.22
Passenger Tax Comp.	242.13	1.14	298.80	1.19	247.16	0.85	371.78	0.82	379.66	0.85
Advertisement, Cable and Show Taxes	184.16	0.86	205.79	0.82	323.09	1.11	387.45	0.86	404.19	0.90
Tax Surcharges	2116.73	9.93	1905.32	7.60	2266.43	7.77	5702.27	12.60	4663.96	10.43
Sub-Total Tax Income	**16192.06**	**75.97**	**16088.75**	**64.21**	**21714.73**	**74.40**	**37331.87**	**82.51**	**38618.36**	**86.39**
Building Permission, Colony Development and Transfer of Property Fees	1668.23	7.83	2452.00	9.79	3399.45	11.65	4049.55	8.95	2652.98	5.93
Rent	252.23	1.18	730.12	2.91	782.46	2.68	806.39	1.78	539.56	1.21
Licenses	440.71	2.07	358.31	1.43	176.58	0.61	256.83	0.57	360.68	0.81
Penalties	5.30	0.02	4.34	0.02	5.88	0.02	6.89	0.02	7.13	0.02
Other Fees & Misc.	772.96	3.63	3128.22	12.49	406.00	1.39	243.24	0.54	312.13	0.70
Interest	167.00	0.78	160.13	0.64	251.65	0.86	274.72	0.61	301.14	0.67
Sub-Total Non-Tax Income	**3306.43**	**15.51**	**6833.12**	**27.27**	**5022.02**	**17.21**	**5637.62**	**12.46**	**4173.62**	**9.34**
Sub-Total Own Source Income	**19498.49**	**91.48**	**22921.87**	**91.49**	**26736.75**	**91.61**	**42969.49**	**94.97**	**42791.98**	**95.72**
Central Grants	661.04	3.10	455.78	1.82	729.38	2.50	661.53	1.46	911.14	2.04
Narmada Salary Grant	300.00	1.41	910.00	3.63	1135.00	3.89	911.13	2.01	991.47	2.22
Other State Grants	853.62	4.01	767.52	3.06	585.5	2.01	1612.29	3.56	1001.65	2.24
Sub-Total Grant Income	**1814.66**	**8.51**	**2133.3**	**8.51**	**2449.88**	8.39	**2273.82**	**5.03**	**1912.79**	**4.28**
Total	**21313.15**	**100.00**	**25055.17**	**100.00**	**29186.63**	**100.00**	**45243.31**	**100.00**	**44704.77**	**100.00**

Source: IMC Budgets 2006-07 to 2010-11

The revenue income data in Table 8 show that the biggest source of revenue is that of Octroi compensation which contributed as 30.42 per cent of the actual revenue in 2006-07 and rose to 48.00 per cent in 2010-11 before dropping to 44.22 per cent in 2010-11. This is the amount given by the State Government in lieu of revenue foregone by the IMC by not collecting octroi on goods coming into the city. The next highest source are the combined water taxes and charges whose proportiion ranges around 10 per cent of the total revenue. This is followed by the group of fees for Building Permission, Transfer of Property and Colony Development, Drainage and Cleanliness tax, Property tax and surcharges on taxes collected by the State Government, which each constitute about 8 per cent of the total actual revenue. The contribution of grants from the Central and State Governments is about 6 per cent of total actual income. The proportion of own tax revenue of the IMC is on the rise from 75.97 per cent of the budgeted revenue in 2006-07 to 86.39 per cent in 2010-11. The non tax revenue has not shown the same bouyancy, however, as it rose from Rs 33.06 crores in 2006-07 to Rs 68.33 crores in 2007-08 and then tapered off to Rs 41.74 crores in 2010-11. The own tax revenue has also stagnated in the last year and so overall there is a lack of bouyancy in the total revenue earnings.

6.6 Property Tax analysis

The big problem in terms of achieving financial sustainability for the IMC is that Property Tax constitutes only about 8 per cent of the own revenues raised by the IMC. In fact the actual property tax income in 2006-07 was Rs 23.36 crores which works out to a per capita property tax collection of Rs 131 as compared to the national average for large cities of Rs 486 per capita for the same year as estimated in a study done by the National Institute of Public Finance and Policy (NIPFP 1). Even in 2010-11 the actual property tax collection was Rs 44.11 crores resulting in a per capita property tax collection of only Rs 225 when it should have at least equalled the average for the Tier I Indian cities which would be Rs 637 assuming an 7 per cent average annual inflation rate from 2006-07. The study says that undervaluation of properties, their non-registration and failure in collection combine to severely undermine property tax collection throughout the country. This problem is very serious in Indore. According to a news report the IMC claimed in February 2010 that "over 1.92 lakh property tax account holders hadn't paid taxes at all for the last three years in a row and cumulatively owe it Rs 297 crore" (HT Live III 3). The report goes on to quote the IMC Commissioner as saying "We have instructed the revenue department to scour each zone so that the largest possible number of unlisted properties can be unearthed." Even government departments have not been paying their property tax.

The Indo-US FIRE-D project that was implemented in Indore from 1997-2003 resulted in an increase in own source revenue from Rs 1945 lakhs to Rs 6351 lakhs at current prices over the six year period at a compound annual growth rate (CAGR) of 21.8 per cent. Mainly through better identification of properties, rationalisation of tax rates and better collection of taxes (FIRE-D 2). The data base and accounting systems were computerised and accrual based accounting was adopted. The number of properites registered for assessment went up from 80,000 in 1997 to 236,000 in 2003 and reached 379,000 in 2011. However, there is still inadequacy in the tax rates and the collection mechanism leading to heavy shortfalls in actual collection. Most importantly the proportion of property tax in own income remains a low 9.87 per cent in 2010-11. Given that the property tax is a progressive tax that makes the richer sections pay more towards the costs of urban governance it should be the main source of income for the IMC. The JNNURM and the ADB have both mandated a higher property tax collection as a sustainable way of improving the finances of the IMC. However, progress on this has been extremely tardy in Indore. The shortfall in actual collection in 2010-11 from the budget estimate was 53.56 per cent.

6.7 Categorywise Revenue Expenditures

Table 9: IMC Detailed Category wise Revenue Expenditures 2006-07 to 2010-11

Category	2006-07		2007-08		2008-09		2009-10		2010-11	
	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)
Other Water Supply O & M (OWS)	985.02	6.10	456.1	2.42	845.57	5.17	450.01	1.56	259.15	0.91
Salaries for OWS	476.1	2.95	435.44	2.31	464.81	2.84	598.82	2.08	292.22	1.03
Electricity for OWS	459.5	2.84	467.1	2.48	534.35	3.27	591.23	2.05	879.82	3.10
Narmada Water Supply O & M (NWS)	1083.3	6.71	1444.52	7.67	387.17	2.37	897.04	3.11	897.31	3.16
Salaries for NWS	943.82	5.84	948.7	5.04	974.58	5.96	1873.27	6.49	1151.69	4.05
Electricity for NWS	1778.69	11.01	2600	13.80	978	5.98	7655.57	26.53	6745.42	23.73
Water Tanker & Emergency Supply	212.4	1.31	234.4	1.24	232.01	1.42	313.55	1.09	726.14	2.55
Sub-Total Water Supply	**5938.83**	**36.77**	**6586.26**	**34.97**	**4416.49**	**26.99**	**12379.49**	**42.90**	**10951.75**	**38.53**
Sanitation & Solid Waste Management O&M	594.46	3.68	368.33	1.96	552.43	3.38	684.84	2.37	380.02	1.34
Sewerage & Stormwater O&M	412.45	2.55	361.64	1.92	515.47	3.15	580.43	2.01	384.24	1.35
Salaries	2142.08	13.26	2239.95	11.89	2226.62	13.61	3853.28	13.35	4523.93	15.92
Sub-Total Sewerage and SWM	**3148.99**	**19.49**	**2969.92**	**15.77**	**3294.52**	**20.13**	**5118.55**	**17.74**	**5288.19**	**18.33**
Water Recharging and Plantation	463	2.87	291.34	1.55	176.46	1.08	389.28	1.35	213.86	0.75
Streetlighting	697.74	4.32	1055.64	5.60	778.78	4.76	1893.3	6.56	1356.87	4.77
Roads	626.34	3.88	423.23	2.25	465.94	2.85	1197.72	4.15	806.06	2.84
Salaries	3308.54	20.48	3480.24	18.48	3059.54	18.70	5394.15	18.69	5956.00	20.96
Interest	782.6	4.84	862.47	4.58	206.56	1.26	1104.85	3.83	1205.16	4.24
Miscellaneous	1186.88	7.35	3166.14	16.81	3966.77	24.24	1380.2	4.78	2643.73	9.30
Total	**16152.92**	**100.00**	**18835.24**	**100.00**	**16365.06**	**100.00**	**28857.54**	**100.00**	**28421.62**	100.00

Source: IMC Budgets 2006-07 to 2010-11

The actual revenue expenditure at current prices shown in Table 9 grew at about 15 per cent CAGR from 2006-07 to 2010-11. The water supply is the biggest category of expenditure constituting 38.53 per cent of the total expenditure in 2010-11. This is followed by the expenditure on sewerage, sanitation and solid waste management which constituted 18.33 per cent of the total expenditure in 2010-11. Salaries for other staff other than water supply, sewerage and solid waste management constituted a fairly high 20.96 per cent of the total expenditure in 2010-11.

6.8 Water Supply Finances

The major area of concern is the financing of water supply. Taking the budgeted estimates for the year 2010-11 as shown in Table A4 in the annexure, the budgeted cumulative receipts from various Water Supply related charges and fees is Rs 9674.50 Lakhs and the State Government Grant for Narmada Water Supply is Rs 2076.34 Lakhs thus totalling Rs 11750.84 Lakhs. Whereas in Table A5 in the annexure the various budget estimates related to water supply expenditures are as follows – Other Water Supply O & M (From Yashwant Sagar and Bilaoli reservoirs and Tubewells) Rs 2400.00 Lakhs, Salaries for Other Water Supply Staff Rs 623.86 Lakhs, Electricity Charges for Other Water Supply Rs 1131.00 Lakhs, Narmada Water Supply O & M Rs 2243.35 Lakhs, Salaries for Narmada Water Supply Staff Rs 2351.34 Lakhs, Electricity Charges for Narmada Water Supply Rs 14700.00 Lakhs and Tanker Water Supply Charges of Rs 720.00 Lakhs totalling Rs 24169.55 Lakhs. Thus, even in the budgeted estimates there is a huge deficit in water supply finances of 105.68 per cent, that is the budgeted water supply expenditure is double the income from water related taxes and fees. This becomes starker when the actual receipts and payments situation is studied.

The actual Water Charges collection in 2010-11 shown in Table 9 above was Rs 4361.11 Lakhs and the Government Grant for Narmada Water Supply was Rs 991.47 Lakhs totalling Rs 5352.58 Lakhs. The actual payments shown in Table 10 below are as follows - Other Water Supply O & M (From Yashwant Sagar and Bilaoli reservoirs and Tubewells) Rs 857.68 Lakhs, Salaries for Other Water Supply Staff Rs 292.22 Lakhs, Electricity Charges for Other Water Supply Rs 879.06 Lakhs, Narmada Water Supply O & M Rs 897.31 Lakhs, Salaries for Narmada Water Supply Rs 1151.69 Lakhs, Electricity Charges for Narmada Water Supply Rs 6745.42 Lakhs and Emergency and Tanker Water Supply Charges of Rs 350.21 Lakhs totalling Rs 11173.59 Lakhs. The actual deficit in the water supply finances is 104.61 per cent. The proportional shortfall in actual receipts from budget estimates has been calculated as the ratio of the difference between the actual receipts and the budget estimates to the budget estimates. The shortfalls are very high at 54.45 per cent in the case of income and 53.69 per cent for expenditure. This means that the IMC does not have the capacity to collect water charges and so it has to rely on other revenue income to make up for the huge deficit in the water supply finances.

Table 10 : Finances of Water Supply of IMC 2010-11

	Narmada Water Supply Exp. (Rs Lakhs)			Other Water Supply Exp. (Rs Lakhs)				Total Water Supply (Rs Lakhs)		
	O & M	Salaries	Electricity	O & M	Salaries	Electricity	Tanker	Expendi-ture	Income	Deficit (%)
Budget Est.	2243.35	2351.34	14700.00	2400.00	623.86	1131.00	720.00	24169.55	11750.84	105.68
Actuals	897.31	1151.69	6745.42	259.15	292.22	879.82	726.14	10951.75	5352.58	104.61
Shortfall (%)	60.00	51.02	54.11	89.20	53.16	22.21	-0.85	54.69	54.45	

Source: IMC Budgets 2010-11 and 2012-13

6.9 Waste Management

The sewerage, storm water and solid waste management finances are also in dire straits. The estimated drainage and cleanliness tax receipts for 2010-11 as shown in Table A4 in the annexure are Rs 9506.00 Lakhs The estimate of expenses in Table A5 in the annexure are – Rs 977.26 Lakhs for Sanitation and Solid Waste Conservancy and Rs 1186.56 Lakhs for Sewerage and Storm Water disposal. This gives a total of Rs 2163.82 Lakhs. The budgeted salary expenses are Rs 3737.00 Lakhs. Thus, the estimated total waste management costs are Rs 5900.82 Lakhs which is well within the budgeted receipts. However, the actual expenditures as shown in Table 11 below are more than the actual receipts. The actual receipts of drainage and sanitation tax in 2010-11 are 3277.37 Lakhs resulting in a huge shortfall of 65.52 per cent. The corresponding actual expenditures are – Rs 380.02 Lakhs for Sanitation and Solid Waste Conservancy and Rs 384.24 Lakhs for Sewerage and Storm Water disposal. The salary costs are Rs 4523.93 Lakhs. Thus, the total actual waste management costs are Rs 5288.19 Lakhs which are 38.05 per cent more than the actual receipts. This poor collection of drainage and cleanliness taxes has created a resource crunch. An important part of waste water management is the recharge of stormwater. A water recharge and plantation tax is collected for this purpose. The budget estimate in 2010-11 was Rs 507.20 Lakhs and the budgeted expenditure for recharging and plantation was Rs 465.05 Lakhs. However the actual receipts in 2010-11 were only Rs 359.61 Lakhs and the actual expenditures were Rs 213.86 Lakhs amounting to a shortfall of 54.01 per cent from the budgeted expenditure. Thus, there is inadequate performance in this crucial sphere also.

Table 11 : Finances of Waste Management of IMC 2010-11

	Wastewater, Sanitation & Solid Waste (Rs Lakhs)						Water Recharge and Plantation (Rs Lakhs)		
	Expenditures								
	Sewerage & Stormwater	Sanitation & Solid Waste	Salaries	Total	Receipts	Difference (%)	Income	Expendi-ture	Surplus (%)
Budget Est.	1186.56	977.26	3737.00	5900.82	9506.00	37.93	507.20	465.05	8.31
Actuals	384.24	380.02	4523.93	5288.19	3277.37	-38.05	359.61	213.86	40.53
Shortfall (%)	67.62	61.11	-21.05	10.35	65.52		29.10	54.01	

Source: IMC Budgets 2010-11 and 2012-13

6.10 Interest Payments

Table 12 below clearly shows that apart from the year 2007-08 there has been a consistent shortfall in actual interest payments from the budget esimates with the highest being 86.72 per cent in 2008-09.

Table 12 : Interest Payments of IMC 2006-07 to 2010-11

	2006-07	2007-08	2008-09	2009-10 (Rs Lakhs)			2010-11 (Rs Lakhs)		
	Amount (Rs Lakhs)			Other	ADB	Total	Other	ADB	Total
Budget Est.	1207.92	785.06	1555.72	2364.06	1600	3964.06	2489.06	1300	3789.06
Actuals	782.60	862.47	206.56	311.07	548.88	859.95	438.42	705.80	1144.22
Difference(%)	35.21	-9.86	86.72	86.84	65.70	78.31	82.39	45.71	69.80

Source: IMC Budgets 2006-07 to 2012-13

The interest payment on the ADB loan has begun from 2009-10 onwards. However, since the water supply from the ADB funded Narmada third phase began coming only from October 2010 onwards and is still not being distributed through metered connections the earnings are not forthcoming. Consequently overall the low level of property tax and water taxes in both the budget estimates and actual collections has resulted in a tight and unsustainable financial situation for the IMC. Preasently in addition to the interest the loan principal repayments have also begun. The outstanding cumulative electricity payment for the Narmada Water Supply itself currently stands at over Rs 200 crores despite a payment of Rs 500 crores having been made in 2005 with a loan from ADB to clear the earlier backlog (HT Live IV 1).

This severe resource crunch has also affected the implementation of the JNNURM as the IMC has found it difficult to mobilise its own 30 per cent contribution and has taken loans for this, further adding to the interest burden. There is no possibility of the JNNURM works being completed by the original deadline of 2012 and in many projects the release of final instalments by the Central Government have been held up (HT Live V 3). In fact with the JNNURM funding coming to an end in 2012 and the loan repayments for the ADB loan having started, the interest and loan repayments are going to cumulatively increase to Rs 59 Crore annually from 2015 (HT Live VI 3) onwards. This is to be compared with the Rs 11.44 crores of actual interest payment made in 2010-11 against the budgeted estimate of interest payment of Rs 37.89 crores. While the shortfall in ADB interest payment is 45.71 per cent that in the payment of other interest is a very high 82.39 per cent.

6.11 Categorywise Capital Receipts

Table 13 : Categorywise Actual Capital Receipts of IMC 2006-07 to 2010-11

Category	2006-07		2007-08		2008-09		2009-10		2010-11	
	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)
ADB	1540.12	13.23	8953.00	41.82	10232.17	36.96	9913.85	47.70	5850.56	29.96
Infrastructure	400.00	3.44								
JNNURM	1000.00	8.59	700.00	3.27	1715.12	6.19	1200.00	5.77	500.00	2.56
Sub-Total Loans	**2940.12**	**25.26**	**9653.00**	**45.09**	**11947.29**	**43.15**	**11113.85**	**53.48**	**6350.56**	**32.52**
JNNURM Central Share	4750.00	40.81	5678.28	26.52	7404.44	26.74	5077.03	24.43	3753.47	19.22
JNNURM State Share	1250.00	10.74	2270.68	10.61	2961.57	10.70	1719.24	8.27	1501.39	7.69
JNNURM IMC Share									3050.17	15.62
State Govt. Grants	1115.43	9.58	786.00	3.67	727.08	2.63	1732.90	8.34	527.76	2.70
Central Govt. Grants	25.00	0.21	55.47	0.26	35.67	0.13	191.50	0.92	5.00	0.03
People's Contribution	764.54	6.57	520.00	2.43	650.51	2.35	45.70	0.22	165.95	0.85
Other Grants	795.00	6.83	2445.00	11.42	3961.47	14.31	902.00	4.34	4172.62	21.37
Sub-Total Grants	**8699.97**	**74.74**	11755.43	**54.91**	15740.74	**56.85**	**9668.37**	**46.52**	**13176.36**	**67.48**
Total	**11640.09**	**100.00**	**21408.43**	**100.00**	**27688.03**	**100.00**	**20782.22**	**100.00**	**19526.92**	**100.00**

Source: IMC Budgets 2006-07 to 2010-11

Table 13 shows that the major contribution to capital receipts have been from the JNNURM grants fromt the Central and State Governments. They constituted 51.55 per cent of the total actual capital receipts in 2006-07 and were still a significant 26.91 per cent in 2010-11. Thus, with the discontinuation of the grants after 2012 there will be a huge deflation in the capital receipts. The next biggest contribution was from the ADB loan for the Narmada Third Phase water supply which constituted 13.23 per cent of the total actual receipts in 2006-07, increasing to 47.70 per cent in 2009-10 before going down to 29.96 per cent of the total actual capital receipts in 2010-11. This source too will end in 2012 further reducing the capital receipts. It is also to be noted that the IMC has had to take loans from banks to fund its own contribution to the JNNURM projects which underlines the precarious state of its resource mobilisation. In fact loans constituted a high proportion of 53.48 per cent of the total actual capital receipts in 2009-10. As mentioned in the beginning of this section the actual captial receipts have fallen short by over 70 per cent and the lack of actual capital resource mobilisation is a matter of serious concern. The actual revenue surplus is just about enough to cover the capital deficit but given the fact that the capital expenditures are way below what is required for proper development of the city this means that the IMC is operating at an underfunded equilibrium resulting in poor urban infrastructure conditions.

6.12 Categorywise Capital Expenditures

Table 14 : Categorywise Capital Expenditures of IMC 2006-07 to 2010-11

Item	2006-07		2007-08		2008-09		2009-10		2010-11	
	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)	Amount (Rs Lakhs)	Prop. of Total (%)
Sewerage and Storm Water			2220.43	7.94	5499.27	13.59	7120.73	19.86	7312.20	21.35
Solid Waste			100.12	0.36	25.57	0.06	1936.55	5.40	799.54	2.33
Water Supply	10489.31	61.46	18930.71	67.69	24507.44	60.57	15527.34	43.31	9151.10	26.72
Roads	853.52	5.00	3275.89	11.71	4506.25	11.14	6099.11	17.01	7706.14	22.50
Streetlighting		0.00	64.40	0.23	98.86	0.24	163.08	0.45	64.55	0.19
Water Recharging and Plantation	448.94	2.63	441.91	1.58	982.75	2.43	515.95	1.44	478.25	1.40
Poverty Pocket Development	106.47	0.62	812.40	2.91	1400.19	3.46	2139.91	5.97	4194.57	12.25
Miscellaneous	3994.84	23.41	978.90	3.50	1442.90	3.57	831.16	2.32	2537.49	7.41
Loan Principle Repayments	1175.08	6.88	1140.70	4.08	2001.44	4.95	1519.90	4.24	2007.29	5.86
Total	**17068.16**	**100.00**	**27965.46**	**100.00**	**40464.67**	**100.00**	**35853.73**	**100.00**	**34251.13**	**100.00**

Source: IMC Budgets 2006-07 to 2010-11

Table 14 shows that water supply and roads have together constituted the major share of the actual capital expenditure accounting for more than half of the total. Water supply infrastructure development has mostly been funded by the ADB loan with only the Yashwant Sagar modernisation funded from JNNURM grants. The road development on the other hand has been funded mainly by JNNURM grants. Sewerage and Stormwater expenditures come next with the share rising from 7.94 per cent in 2007-08 to 21.35 per cent of the total actual capital expenditure in 2010-11. These also have been funded by the JNNURM. The last

major head is Poverty Pocket Development once again funded by the JNNURM whose share has risen from 0.62 in 2006-07 to 12.25 per cent in 2010-11. The miscellaneous category includes, computerisation, GIS mapping of various assets and services and construction of buildings mostly funded by JNNURM. Due to the huge shortfall in capital receipts mentioned earlier, the actual capital expenditures are far below the budget estimates as shown for 2010-11 in Table 15 below.

Table 15 : Capital Expenditures of IMC 2010-11

	Sewerage and Storm Water	Solid Waste	Water Supply	Roads	Street-lighting	Water Rechar-ging and Planta-tion	Poverty Pocket Develop ment	Misce-llaneous	Loan Repay-ment	Total
Budget Est. (Rs Lakhs)	18715.00	2926.00	19056.45	32663.00	1121.00	1885.00	9407.00	11390.1	2407.02	99570.60
Actuals (Rs Lakhs)	8821.4	910.31	9463.87	6859.49	64.55	542.49	3521.00	2060.72	2007.29	34251.13
Shortfall (%)	52.86	68.89	50.34	79.00	94.24	71.22	62.57	81.91	16.61	65.60

Source: IMC Budgets 2010-11 & 2012-13

Not considering the assorted miscellaneous category, the highest shortfall of actual capital expenditure from budgeted estimates is in Streetlighting of 94.24 per cent. This is followed by Roads which has a shortfall of 79 per cent. Water Recharging and Plantation comes next with 71.22 per cent. Solid Waste expenditures have fallen short by 68.89 per cent and Poverty Pocket development by 62.57 per cent. Water Supply and Sewerage and Stormwater expenditures are in a relatively better situation because the ADB and JNNURM financing but once this tapers off from 2012 onwards these sectors too will feel the crunch more. It is interesting to note that the Loan Repayments have seen the least amount of shortfall at 16.61 per cent as it is crucial to repay loans on time to maintain the credit rating of the IMC.

6.13 Conclusions of Budget Analysis

The conclusions from this detailed analysis of the budget of the IMC are as follows –

1. The overall revenue and capital mobilisation by the IMC is very poor and there is a consistent shortfall in the actual receipts from the budget estimates in all the five years studied by an average of about 40 per cent in the case revenue receipts and 60 per cent in the case of capital receipts.
2. This is primarily due to the inability of the IMC to improve Property Tax collection which was on an average only 8 per cent of the total revenue with a per capita collection of Rs 225 in 2010-11. Being a progressive tax it should have constituted at least 25 per cent of the total revenue and achieved the average per capita collection level for Tier I Indian cities of Rs 637. Moreover, the JNNURM norm of identification and registration of 85 per cent of properties and collection efficiency of 90 per cent from these is not being met by a long way.
3. The actual tax and charge collections in the WSS sector also fall behind estimates drastically with the shortfalls in 2010-11 being roughly 55% for water supply and 65% for solid and liquid waste management. The deficit in revenue collection from actual O&M costs is a very high 65 per cent. If the loan repayment and interest costs are included then this shortfall is 68 per cent. This not only results in poor WSS service delivery but also necessitates the diversion of revenue collected from other

sources for making up the deficit in the WSS sector. Consequently the overall service delivery of the IMC is jeopardised as other sectors also suffer from a funds crunch. This is a gross failure to meet JNNURM norms.

4. The poor revenue mobilisation of the IMC results in a low revenue surplus which adversely affects its ability to mobilise capital resources through loans. There is a heavy reliance on grants for capital expenditure and there are on an average heavy shortfalls of 65 per cent in capital receipts and 60 per cent in capital expenditures.
5. Consequently the revenue expenditures of the IMC were only about a third and capital expenditures were about a half of the average for Tier I Indian cities which itself is way below that of cities in the developed and other middle income countries.
6. The ratio of the fiscal deficit to the sum of the revenue and grant income in 2010-11 was 8.2 per cent and the debt service ratio was 7.06 per cent which are manageable. However, from 2012-13 onwards the substantial grant income from JNNURM will decrease and the substantial ADB loan principle repayments will increase thus adversely affecting both these ratios. The debt service ratio will rise to about 20 per cent from 2015 onwards.
7. The IMC will have to maintain the schedule of interest and loan principle repayments to avoid a downgrading of its credit rating and this means that it will have much lesser revenue and capital resources for service provision and development in the future.
8. Thus, this detailed budget analysis clearly establishes that the IMC is nowhere near achieving financial sustainability in the sense of being able to mobilise enough resources through taxes, charges, loans and grants to provide an adequate level of municipal services and urban infrastructure development.

7. Review of Water Supply and Sanitation in Indore

A more detailed study of the water supply and sanitation situation in Indore will now be undertaken to arrive at a proper understanding of the hurdles to sustainable water management in the city.

7.1 Unit cost of Water Supply

Table 16: Indore Municipal Corporation Cost of Supply of Water in 2010-11

Type of Supply		Narmada Water Supply (NWS) Phase I & II	Yeshwant Sagar & Bilawli	Tubewell Supply	Total
Costs in Rs Lakhs	Salaries	1151.69	164.72	127.50	1443.91
	O & M	897.31	29.80	229.35	1156.46
	Electricity	6745.42	163.33	716.49	7625.24
	Interest Payments	788.96	0	0	788.96
	Total	9583.38	357.85	1073.34	11014.57
Daily Water Supply in MLD		158	43.5	42	243.5
Average Cost of Water in Rs/1000 litres		16.62	2.25	7.01	12.39
Monthly Cost of 135 lpcd supply for a household of 5 in Rs		336.55	45.56	141.95	250.89
Loan Principle Repayments for Water Supply Infrastructure in Rs Lakhs		659.03	0	0	659.03

Type of Supply	Narmada Water Supply (NWS) Phase I & II	Yeshwant Sagar & Bilawli	Tubewell Supply	Total
Average Cost of Water including Loan Principle Repayment in Rs/1000 litres	17.76	2.25	7.01	13.13
Monthly Cost including Loan Principle Repayment of 135 lpcd supply for a household of 5 in Rs	359.64	45.56	141.95	265.88

Source: Calculated from IMC Budget 2012-13 and Water Supply Data.

The rough estimation above of the per unit volume cost of the water supply of IMC in 2010-11 has been done on the basis of the actual expenditures on the various components in Table 16. The costs have been estimated separately for the various sources for comparison. It has been assumed that the water that is lost and unaccounted for is non-revenue water for which the IMC does not get any payment. For calculating the per unit volume cost of water it is assumed that there is supply of water on all 365 days from all sources even though in reality there are large gaps in supply, most glaringly so in the Yeshwantsagar, Bilawli and Tubewell supplies which dry up in peak summer. It is also assumed that the average household is of 5 members. The monthly costs have been worked out for the norm of 135 lpcd supply. Two scenarios have been estimated. In the first scenario only the interest payments are considered as per the practice that is generally adopted of ignoring the principle repayments. In the second scenario the loan repayment is also counted in the overall costs.

The total cost of water supply in 2011 was Rs 11014.57 Lakhs. This is slightly different from the amount calculated earlier in Table 10 because here the interest payments made from revenue receipts have been included instead of the cost of tanker charges in the earlier table. The cost of the water from the Narmada Supply was the highest at Rs 16.62 per 1000 litres while it was lowest for the Yashwant Sagar and Bilawali supply at Rs 2.25 per thousand litres and that for the tubewell supply was Rs 7.01 per thousand litres. The average cost for the total water supply was Rs 12.39 per thousand litres. The monthly average cost of supplying a five member household the standard supply of 135 lpcd was Rs 250.89.

Similarly if the loan principle repayment cost is counted then the cost of Narmada Supply water goes upto Rs 17.76 per 1000 litres and the average cost of supply to 13.13 per thousand litres. The monthly cost of supplying a five member household the standard supply of 135 lpcd goes upto Rs 359.64 and for the total this goes upto Rs 265.88. As we have seen earlier in Table 3, the average piped water supply to 54 per cent of the population which is being charged for its supply is 170.3 lpcd. The weighted average cost of this supply from the Narmada, Yashwant Sagar and Bilawli sources is Rs 14.41 per 1000 litres as calculated from Table 16. So the actual cost to the IMC of piped water supply for a family of 5 in 2011 was higher at Rs 368.10 per month.

A further analysis of the unit cost of water by the major expenditure items given in Table 17 below reveals the reasons for the difference in costs for different sources. The main reason for the difference is that the electricity cost is very high for the Narmada water supply as compared to the Yeshwant Sagar, Bilawli and Tubewell supply. Even though the ADB loan principle repayment was the lowest expenditure item in 2011 from 2015 onwards this expenditure will mount to Rs 4600 lakhs annually and add considerably to the water costs.

Table 17: IMC Unit Cost of Water Supply by Item of Expenditure

	Narmada Water Supply (NWS) (Rs/1000 litres)	Proportion (%)	Yeshwant Sagar & Bilawli (Rs/1000 litres)	Proportion (%)	Tubewell Supply (Rs/1000 litres)	Proportion (%)

Salaries	2.00	11.26	1.04	46.22	0.83	11.84
O&M	1.55	8.72	0.19	8.45	1.50	21.40
Electricity	11.70	65.88	1.02	45.33	4.68	
Interest Payments	1.37	7.71	0.00	0	0.00	
Principle Repayment	1.14	6.42				
Total	17.76	100.00	2.25	100.00	7.01	

Source: Calculated from IMC Budget 2012-13 and Water Supply Data.

The total actual receipts in water taxes, grants, charges and fees in 2010-11 was Rs 5352.58 Lakhs as follows –

1. Water taxes on domestic consumers - Rs 2762.75 Lakhs
2. Charges for supply to bulk consumers - Rs 768.51 Lakhs
3. Grants from the State Government - 991.47 Lakhs
4. Miscellaneous charges and fees - Rs 829.85 Lakhs

There were 1,73,603 registered domestic water connections covering 54 per cent of the population who were being charged at rates varying from Rs 200 per month for a half inch connection to Rs 4200 per month for a one and a half inch connection. The average water tax per connection according to the IMC is Rs 225 and so the total water tax collection from the registered users should have been at least Rs 4687.29 Lakhs. Consequently there is a massive under collection of 41.06 per cent and probably closer to 50 per cent if the actual distribution of connections is properly surveyed. The bulk supply rate charged by the IMC is Rs 30 per 1000 litres for industries and Rs 25 per 1000 litres for commercial establishments like Hotels. The total registered bulk supply is 21 MLD and so the bulk charge collection should be at least Rs 1916.25 Lakhs. Thus, here too there is an under collection of more than 50 per cent. So not only is there a very high proportion of losses and unaccounted water but the revenue for the accounted water is also not being collected properly by the IMC. To add insult to injury even State and Central Government agencies are not paying their water dues and have run up bills of over a lakh rupees each and the total outstanding is close to Rs 100 crores (HT Live VII 1). These results have been summed up in Table 18 below.

Table 18: Under Recovery of Water Taxes and Charges by IMC 2010-11

	Taxes/Charges Collected (Rs Lakhs)	Minimum Amount that Should have been Collected (Rs Lakhs)	Under Recovery (%)
Domestic Supply	2762.75	4687.29	41.06
Bulk Commerical Supply	768.51	1916.25	59.90

Source: Calculated from IMC Budget 2012-13 and Water Supply Data.

7.2 Affordability of WSS Services

The ADB as mentioned earlier has claimed that the combined enhanced water supply and sanitation charges are within 4-5 per cent of household expenses and so has deemed them to be affordable. The total monthly charge per household for water supply and sanitation in 2011 as per the ADB calculation would be Rs 244. As we have seen the actual monthly cost of water supply for the IMC to the water charges paying households was Rs 368 in 2011. The actual sewerage and sanitation charges for 2010-11 as shown in Table 11 were Rs 5288.19 Lakhs. There were roughly 392000 households in Indore in 2011 assuming an average

household size of five. According to the IMC, 27 per cent of the population of Indore live in poverty pockets though this is in all probability an under estimation. However, in the absence of any other survey this will be taken for analysis. Even though according to the official poverty line expenditure about 20 per cent of the population of Indore live below it(Tyagi et al 4), this has come to be contested as being a gross under estimation (Patnaik 42). So the whole of the population living in poverty pockets will have to be assumed as being in no position to pay any taxes or charges whatsoever but must be provided with free water and sewerage services from a social equity perspective. Consequently the number of households that will bear the cost of sewerage and sanitation comes down by 27 per cent to 286,000. The monthly sewerage and sanitation cost per household then comes to Rs 154. Thus, the total WSS charge per household came to Rs 522 in 2011.

The Average urban monthly per capita consumer expenditure in the 66th round of the National Sample Survey Organisation survey for Madhya Pradesh in 2010-11 was Rs 1666 (NSSO 6). Assuming a household of five persons this gives an average monthly household consumer expenditure in 2010-11 of Rs 8330. Thus, the proportion of the combined water cum sanitation tax works out to 6.26 per cent of the average monthly household expenditure. The proportion of households who had a monthly per capita consumer expenditure less than Rs 1666 in 2010-11 was 70 per cent. Of this the 27 per cent living in poverty pockets would not be paying the water charges and so a fairly large 43 per cent of the population would have to pay 6.25 per cent or more of their household expenditure for WSS charges. Thus, a fairly large section of the population of Indore would find it difficult to meet the actual costs of water supply and sanitation being incurred by the IMC at present and definitely so when these charges go up in future as the services are enhanced and the ADB loan principal repayments begin. Consequently, the average combined monthly WSS charge actually being levied by the IMC at present is only Rs 227. So the ADB's claim based on its analysis that the WSS charges will be affordable is not substantiated by reality.

7.3 Critique of Water Supply System

No wonder the IMC is severely stressed in meeting the water supply costs and is running up huge outstanding payments of electricity bills in addition to being unable to maintain the water supply systems properly. The present water tax amounts to an average of about Rs 225 per month per water connection. This is less than the average monthly cost of providing 135 lcpd to a family of 5 which is Rs 250.89 per month for the whole water supply. Even the much lower amount of Rs 225 per month that is being charged by the IMC is not being collected properly as mentioned earlier. Thus, from the point of view of financial sustainability the major problem is that the huge costs of water supply are not being recovered from the consumers and even more so from the affluent sections who are receiving a greater share of the supply and who are quite capable of meeting these costs. The foregoing analysis can now form the basis of a critique of the IMC water supply system as follows –

1. The older Narmada Water Supply system is in serious disrepair. There are not only breaks in the piping system but also probably a high level of water theft is going on. The cost of Narmada water supply has always been high and so from the beginning there have been under recoveries as the consumers have been subsidised. The State Government has been providing grants to somehow keep the system running but this has resulted in poor maintenance of the system and with age it has deteriorated. The first phase of the system is close to 40 years old and the second phase is more than 20 years old. The distribution system is of 1931 vintage in parts. The later additions to the distribution system have been in an unplanned and haphazard manner and this has led to the pressure distribution in the pipeline going awry. Especially the

addition of overhead tanks without a properly redesigned and laid out distribution system has put pressure on the existing pipelines and there are frequent outages. Moreover water meters have not been installed to keep a tab on the water being supplied and so there is no way in which to monitor the losses and the reasons for them.

2. The major cost component of the Narmada supply systems is the electricity cost which constitutes 70.4 per cent. The cost of electricity also is going up in leaps and bounds because there is pressure on the electricity generation and distribution companies to recover costs. The accumulated losses of all the government companies involved in distribution of electricity in Madhya Pradesh was more than Rs 12000 crores in 2011 (Dixit 3). Whereas the price of high tension power required for the Narmada pumping has gone up from Rs 3.68 per unit to Rs 5.13 per unit in 2011, it has gone up from Rs 3.42 per unit to Rs 4.47 per unit for low tension power used for tubewells (HT Live VIII 1). This will further increase the financial unsustainability of the Narmada water supply system. The start of the first phase of 90 MLD of the new Narmada supply funded by the ADB loan was in fact held up due to the power distribution company refusing to provide power unless an advance payment of Rs 10 crore was made. Eventually the Madhya Pradesh Electricity Regulatory Commission ruled that the outstanding dues on the earlier phases could not be advanced as an excuse for demanding such a high advance for starting the third phase and so the water supply started (HT Live IX 1).

3. Groundwater supply is much cheaper but possibilities of enhancing this supply have not been explored at all by the IMC. Instead private parties have indiscriminately exploited the ground water reserves for commercial supply. Neither have any serious steps been taken by the IMC to ensure recharge of water. The cheapest sources of supply are the Yashwant Sagar and Bilawli reservoirs. The possibilities of building a few more such reservoirs in the rural areas of Indore have not been explored at all. Instead there has been a proliferation of tubewells which draw water from the deep aquifer at 200 metres or more depth to supply water commercially through tankers at rates which are currently about Rs 70 for 1000 litres (HT Live X 1).

4. There has been continuous development of the notified Green Belt areas in the Town Plan of 1975 and this has further aggravated the lack of water recharge. In a desperate bid to retain the green belt areas in the new Town Plan 2021 notified in 2008, the Government announced that it would acquire the agricultural land in the catchment of the Bilawli tank and hand it over to a franchisee to operate a golf course. Little did the government know that a golf course requires huge amounts of water for its operation. Anyway a massive agitation by the farmers put paid to this proposal (HT Live XI 1).

5. This gross mismanagement of water supply has resulted in the high price of water for those without access to IMC supply or private sources of their own, mostly living in the poverty pockets. As mentioned earlier this proportion is 46 per cent of the total population of the city and it gets on an average only 46.6 lpcd. During the summer months the IMC has to provide water through tankers to this section and the cost of this in 2011 was Rs 7.26 crores. The cumulative effect of the financial unsustainability of surface water supply and the environmental unsustainability of groundwater supply in Indore city bodes a future water crisis of gargantuan proportions.

7.4 Critique of ADB Plan

The ADB in its own appraisal review had found that the technical, managerial and financial operation of the existing two phases of the Narmada water supply were severely inadequate and consequently they were suffering from huge revenue losses. Nevertheless, the possibilities of planned local ground and surface water development were ignored totally and the third phase was sanctioned. The assumption was that the losses in the water supply system would be substantially brought down as a result of better technical and managerial practices reducing them from the previous levels drastically. This expectation has been belied as has been demonstrated by the foregoing analysis.

Moreover, the cost of power has gone up much more than was envisaged in the financial calculations of the ADB. A sensitivity analysis conducted in the EIRR estimation showed that slippage in completion dates of the project, cost overruns and failure to improve the operation and maintenance and cost recovery would greatly reduce the EIRR and render the project unfeasible. These negativities have all occurred and so the project has in reality become unviable. Crucially the new distribution system for the third phase is not in place and so the same old leaky system is being used for a higher supply, leading to frequent breakdowns and higher losses.

The FIRR was calculated as 5.6% on the assumption of the water tax going up from Rs 60 in 2003 to Rs 190 in 2009. Thereafter metering was to be introduced in all old connections and new ones were to be compulsorily metered. Simultaneously, the coverage and collection efficiencies were to be 75 per cent and the non revenue water was to be only 20 per cent. However, even in 2011, none of these assumptions are true as we have seen in the financial analysis done earlier and in reality huge losses and outstanding dues are being run up. These losses and dues are going to increase even more as the full annual loan repayment burden of Rs 59 crores starts from 2015 onwards. The IMC has said that the cost of the Narmada water supply will go up to Rs 25 per 1000 litres by 2015 (Khan S "Monthly Water bills" 2)

The ADB has suggested that to improve operation and maintenance efficiency and recovery of costs the distribution of water under the new phase should be done as a PPP enterprise wherein the IMC would supply water in bulk to an overhead tank and the further distribution and charge collection would be undertaken by a private franchisee. There would be 24x7 water supply with metering to improve efficiency and cut down on losses. The Rajendranagar locality has been chosen as the first area for this new mode of water supply. However, the project has got delayed as one of the bidders had contested the award of the contract to another franchisee in the High Court. Though the matter has been resolved work is yet to start. Even so as the project has evolved, the capital costs of construction of overhead tanks and the laying of distribution lines will have to be borne by the IMC and the franchisee will only recover the operation and maintenance costs through user fees (HT Live XII 1). This further undermines the financial viability of this model as the loan repayment for the infrastructure will have to be borne from other sources. There is obviously no provision for the poverty pockets in this PPP model and so given the high costs of water supply there is every likelihood of supply to these becoming even less than what it is at present.

7.5 Critique of Sewerage, Stormwater and Solid Waste Management

The enhanced sewerage and solid waste system that is being put in place with JNNURM grants will require more revenue for operation and maintenance. Even the current drainage and sanitation tax collection is inadequate for covering the expenses being incurred currently and so these services are being performed poorly. As much as 40 per cent of the garbage putrefies in the city itself creating health hazards (HT Live XIII 1). The 60 per cent

that is collected is dumped in a dumping ground at Dev Guradiya village which has now come within the city limits in the new Town Plan 2021 notified in 2008. Since scientific incineration is not taking place, the burning of the garbage is releasing polluting gases and creating a public health hazard (HT Live XIV 1).

Similar to the case of water supply, the under performance in the sewerage and sanitation sector adversely affects the poor in Indore. Currently the 604 poverty pockets described earlier are very ill served as far as sanitation services are concerned. The proportion of households in poverty pockets without toilets in Indore is 77 per cent, the proportion of poverty pockets without community toilets is 80 per cent and the proportion of poverty pockets that get waterlogged in the monsoons is 78% (Water Aid 8 -11). The waterlogging is mainly due to the clogging of drains with solid waste which is not collected regularly from these areas. There is a realisation among the planners following accepted global thinking that poor people have to be shielded from the marketisation of civic amenities as they do not have the economic wherewithal to pay for them (Mkandawire 14). So there are provisions in the JNNURM, ADB Plan, the UN Habitat project and the DFID project for poverty pocket improvement ranging from water supply, sewerage, storm water drainage and solid waste collection. However, the implementation of this Basic Services for the Urban Poor component has been lagging behind badly (HT Live XV 1).

The lack of proper sewerage and sanitation services has meant that the poor have had to resort to open defecation. The more affluent households that are not connected to the limited sewerage system have to rely on septic tanks. These septic tanks are not properly constructed and release their untreated water into the ground thus polluting the groundwater. Tests carried out by the IMC on samples of tubewell water have shown that most of them are contaminated. Even for the Narmada supply 10% of the samples were found to be contaminated indicating that ingress of polluted water is taking place in the distribution network (HT Live XVI 4).

8. Discussion of Possible Remedial Measures

The foregoing discussion has made it clear that there is an urgent need to explore other systems of WSS for Indore than the one that has been adopted so far. Even if the technical inefficiencies and the loss of water are controlled the problem of the burgeoning electricity bill for Narmada water supply as also for sewage treatment will always remain. Normally for any public body faced with a problem in water supply either due to an increase in costs or due to lack of sources there should be a genuine evaluation of different alternatives to choose the best solution. Like in India so also elsewhere in the world, the increasing demands for water for large urban agglomerations is a serious problem. Thus, there is a need to explore alternative WSS systems from the prevalent ones. Two such effective systems outside India are first reviewed here for gaining insights into how the WSS sector can be better managed.

8.1 Natural Water Supply System for New York City

The first is of New York City in the USA. The water supply of New York city is unique in that it requires only minor water treatment. Streams in the Catskill and Delaware Mountains, about 160 kms northwest of the city, are directed into six reservoirs. The water is piped into the city and delivered to the consumers (Mehaffy 1). The region is heavily forested with a population of only 60,000 people and so the soil acts as a purifying medium and the water flowing in the streams is potable. However, in the early 1990s it was noticed that the water quality was deteriorating and that very soon huge investments would have to be made to install a filtration plant in New York to purify the water. The capital costs were estimated at around US $ 6-8 billion and the annual operating costs at about US $ 300 million.

This set the city planners thinking about why the water quality had deteriorated despite there still being heavy forests and a sparse population as before. The US Environment Protection Agency (EPA) conducted a detailed study to investigate the reasons for the deterioration of water quality. The study found that chemical agriculture and cattle farming had increased near the streams and this was causing excess fertilisers, pesticides and dung to flow into the reservoirs. Moreover, people from the city had built weekend holiday homes on the shore of the reservoirs in large numbers and the untreated sewage and waste water from these was seeping into the reservoirs and causing the water quality to deteriorate even further.

Studies showed that buying up land near the reservoirs, installing sewage and waste water treatment plants and paying the farmers not to cultivate land or graze cattle near the streams would cost about $ 1-2 billion initially and later have a recurring cost of as little as $ 10 million annually. This would ensure that the water flowing into the reservoirs became potable as before. Thus, New York City Corporation raised the money through municipal bonds and carried out this environmental restoration and sanitisation project instead of going for the much more costly option of installing a water filtration plant. As the then Commissioner of the District EPA said "All filtration does is solve a problem. Preventing the problem, through watershed protection, is faster, cheaper, and has lots of other benefits. Weighing the costs and benefits, watershed protection was not a difficult decision" (Heal 51).

8.2 Water Sensitive Urban Design in South Australia

The second example is from the State of South Australia and especially the city of Adelaide. The turn of the century brought forth two problems for the city and other big urban centres in South Australia. The first was that the storm water drainage infrastructure had aged and also become inadequate because of high density urban development. Consequently flooding was taking place and the storm water was also getting polluted and lowering the quality of water in natural water bodies and streams and the Murray River. Secondly increasing water needs could not be met from the Murray River. A large investment was required in improving the storm water drainage system and in augmenting the water supply. This was when the South Australian Government thought of combining the two and the result was a composite Stormwater Policy in 2004 and a stormwater management programme. (http://www.samdbnrm.sa.gov.au/Water/UrbanStormwaterManagementProgram/UrbanStormwaterManagement.aspx). The programme involves –

- Improving the quality of stormwater entering the River Murray,
- Diversifying Adelaide's water sources to reduce reliance on the River Murray (ie. maximising opportunities for "fit for purpose" water use),
- Reducing demand for water on a per person basis,
- Reducing the risk of flooding in urban areas,
- Preventing erosion of waterways, and
- Protecting the ecological, scenic and landscape values of streams.

The programme is based on the concept of Water Sensitive Urban Design (WSUD) which is defined as "an approach to urban planning and design that integrates the management of the total water cycle into the urban development process. It includes:

- Integrated management of groundwater, surface runoff (including stormwater), drinking water and wastewater to protect water related environmental, recreational and cultural values,
- Storage, treatment and beneficial use of runoff,
- Treatment and reuse of wastewater,
- Using vegetation for treatment purposes, water efficient landscaping and enhancing biodiversity, and

- Utilising water saving measures within and outside domestic, commercial, industrial and institutional premises to minimise requirements for drinking and non drinking water supplies."

Thus, by reusing stormwater through appropriate water harvesting techniques involving both surface and aquifer storage and the treatment and reuse of waste water, the need for expensive drainage and water supply systems is reduced considerably. The design of buildings is done in such a way as to save on water use and increase water storage and reuse. In the process the environment is also conserved as extensive soil conservation and plantation activity is undertaken in the unbuilt environment. The crucial commonality between these two examples is the realisation on the part of policy makers and planners that working with nature is beneficial both financially and environmentally. This can bring about substantial benefits at less cost compared to further investments in solutions that rely only on technological fixes for water supply and waste water management problems. In the urban water management context this involves an optimal use of both groundwater and surface water sources and where feasible recharging and reuse of storm and waste water.

8.3 Recharging of Groundwater Aquifers in Indore

As we have seen in Table 16 it is far cheaper to source groundwater and surface water locally in Indore than surface water from the Narmada. In fact if a proper water inventory of all the groundwater being sourced in Indore by private parties for domestic and commercial supply is done it may well turn out that it is more than the surface water supply. However, due to unplanned pumping of groundwater and lack of artificial recharge, over exploitation has taken place. It is in this context that solutions that incorporate extensive water recharging and wastewater treatment and reuse have to be explored for a sustainable hybrid ground cum surface water combination. One such proposal is that given by the hydrogeologist Mr Sudhindra Mohan Sharma (Mekaad 1). There are locations within the IMC area where there are substantial fractures in the deep aquifer layer at a depth of about 40 meters. The normally impervious basalt rock in this layer can absorb and store large quantities of water in these fractures. Thus, if the rain water in the catchment of these fractured zones is collected and channelled to these areas and then filtered and recharged into the fractures through vertical shafts then cumulatively a reserve that can yield 65 MLD of water throughout the year can be created within the IMC area itself. The cost of such a decentralised recharge system is far less than laying a network of underground stormwater drains throughout the city.

In addition to this there are already rules that all buildings of area more than 140 sq mtrs must have water recharging systems in place so that all the stormwater is filtered and recharged within these building premises in a decentralised manner (MP Govt 121). However, these rules are not being followed. The cost of installing a water recharge system is about 3 per cent of the total building cost and it goes down proportionately as the size of the building increases, yet this is not being done. The benefits in terms of obviating the need for extensive centralised storm water drainage systems and increasing the groundwater availability far outweigh these costs. Moreover, since these costs will be borne by the building owners themselves it is a progressive measure wherein those with better economic capacity are made to bear the costs of WSS directly without burdening the IMC.

The Central Groundwater Board has prepared a detailed artificial recharge master plan for the whole of the country so as to replenish the available groundwater storage capacity. The details of the measures needed to be adopted in the Gambhir and Shipra River basins which form the catchment of Indore city have been given in it (CGWB "Masterplan" 65). If this plan were to be implemented then the availability of groundwater in the whole of the

catchment of Indore city would be improved considerably resulting in the people in rural areas desisting from stealing water from the Narmada pipeline as they are doing at present. Moreover, surface water bodies could be built in greater numbers to provide water sources like the Yashwant Sagar and Bilawli reservoirs. In neighbouring Dewas district a people's campaign for the digging of farm ponds has succeeded in both recharging ground water and also reducing dependence on it for agriculture and drinking water needs which has been awarded by the United Nations (http://www.un.org/waterforlifedecade/finalists2012.shtml). As mentioned earlier the potential for reharge in the Indore Planning Area of 505 sq km itself is 1038 MLD which can easily take care of the water supply requirements of the city.

8.4 Treatment and Reuse of Waste Water

Then, there is the issue of treatment and reuse of wastewater. As with storm water so with wastewater it is much cheaper to treat and reuse or recharge it in a decentralised manner. The Dhas Gramin Vikas Kendra in Indore has installed such a decentralised system in its office premises in which the bathroom and kitchen wastewater is filtered through a soakpit and recharged into the ground with a BoD of less than 30 mg/litre which is the permissible limit. The toilet waste water is first directed into a septic tank. This septic tank has an aerator installed in it that causes aerobic digestion of the waste to take place. Thus, the inlet water which has a BoD of about 500mg/litre is treated by the aeration process resulting in a BoD of about 55 mg/litre of the water flowing out of the septic tank. This water is then filtered through a soakpit and the final water that seeps into the ground has a BoD within the permissible limit of 30 mg/litre. The installation cost of this system is less than 1 per cent of the total building cost while the running cost of the aerator is only Rs 2/1000litres/day of toilet sewage. Moreover, due to the oxidation of sewage through aeration there is no generation of sludge and foul smelling greenhouse gases. Most importantly the need for a centralised underground sewer system and sewage treatment plants, which are expensive to construct and maintain, can be done away with. Over and above this all the waste water which constitutes about 90% of the potable water supplied, is recharged into the ground enhancing the groundwater availability. The greater availability of groundwater will mean a lesser use of electrical energy which in turn means the lesser production of greenhouse gases. Thus, this alternative system will also have a positive climate change mitigation impact. There is also the option of treating the wastewater a little more and re-using it for flushing of toilets and gardening which together constitute close to 47 per cent of the water use (CPHEEO 5).

8.5 Water Sensitive Urban Design for Indore

Thus, by using the WSUD principles developed in South Australia that have been described earlier, it is possible to design a hybrid ground cum surface water system of water supply. This will be augmented by storm water recharge and waste water treatment and recharge and reuse done in a decentralised manner that is much more sustainable in financial, social and environmental terms. This kind of hybrid alternative system has also been recommended by a committee formed to recommend National Sustainable Habitat Standards for the Urban Water Supply and Sewerage sector under the National Mission for Sustainable Habitat (NMSH 7). Instead of relying on taxes, user charges and grants to fund hugely expensive centralised systems, this alternative system would put the onus on the more affluent citizens, corporations, private institutions and government institutions, who are all in possession of a considerable portion of urban land to tackle their water supply and waste water disposal needs in a decentralised manner. Detailed surveys and design would have to be carried out to determine the actual benefit/cost ratio and EIRR and FIRR of such an alternative plan and then compare it with the surface water from Narmada only alternative

that has been implemented by the IMC. This is what should have been done by the ADB and the JNNURM instead of rejecting the hybrid alternative out of hand altogether.

There are many examples of such WSUD design in India in the development of residential colonies. One such example is that of a private gated layout called Rainbow Drive in the Sarjapur suburb of Bengaluru city in Karnataka (Krishnamurthy 1). Bengaluru like Indore has to depend for its water needs on external sources. Water has to be pumped up from the River Kaveri which is about 50 kms away and 300 metres lower in height above mean sea level. Despite 810 MLD of water being sourced from the Kaveri, there is still a shortage and so many of the newer residential layouts in the peri-urban areas do not get water (Ranganathan 53). The Rainbow drive has 220 residences in 34 acres. Initially the layout had both community borewells and individual borewells. This led to rapid exhaustion of the groundwater and many borewells went dry leading to the need to purchase 100 to 150 tankers of water every day. Moreover due to the stormwater drain on the main road being at a higher level than the colony the stormwater would accumulate during heavy rains. The two sewage treatment plants were not working properly. The residents association of the layout then sought the help of a water consultancy firm in 2008. Over the years both individual and community recharging of storm water has been introduced. Individual borewells have been capped and metering of water supply from the community wells has been introduced along with proper pricing. The sewage treatment plants have been redesigned and the waste water is being used for gardening purposes. The layout has now become sustainable in its water management. In Indore itself two institutions, a private school, Daly College, spread over 47 hectares and a government engineering college, Shree Govindram Sekhsaria Institute of Technology and Science, spread over 14 hectares, have installed water recharging, waste treatment and reuse systems which have made them self sufficient in their water supply. Unfortunately the IMC itself, despite being in possession of vast areas of the city has not utilised the resources garnered from the water recharging tax that it collects for this work.

Finally the contentious issue of the high electricity charges of the Narmada water supply have also to be tackled. The daily consumption of electricity for the Narmada water supply is around 8 Lakh KwH of high tension power which is equivalent to a power demand of 33 MW. A considerable portion of this demand if not all of it can be met by solar power. The solar insolation available in western Madhya Pradesh and the number of clear days roughly give a requirement of about 30 hectares of land area and about Rs 12 crore capital cost for setting up solar panel arrays to produce 1 MW of electricity. Thus, the total requirement is about 1000 hectares of land and Rs 500 crores. The IMC water works already have the land and in fact by covering the siltation tanks with solar arrays evaporation loss would be prevented in addition to getting Clean Development Mechanism (CDM) credits. The IMC has now initiated a feasibility study for this with a solar power firm (HT Indore "Mumbai Firm" 3).

9. Conclusions and Recommendations

The facts and the analysis above lead us to the following conclusions –

1. The finances of the Indore Municipal Corporation as a whole are unsustainable. Property taxes which should constitute the major source of income because they are a progressive tax that is borne proportionately more by the more affluent citizens, contribute only 11% of the own revenue of the IMC and 9% of the total revenue. The actual per capita property tax revenue in 2006-07 was a meagre Rs 131 as against the national average of Rs 486 and even in 2010-11 it was only Rs 225. The identification of properties for taxation is poor, the rate of taxation is low and the collection too is far below standard. Consequently, the IMC faces a severe resource

crunch which affects the quality of services that it provides. Moreover, the actual revenue receipts are about 60% of the budget estimates. This leads to a resource crunch and a shortfall in the revenue payments also. There is an excessive dependence on grants and loans for capital expenditures as the revenue surplus is not enough to fund these. There is a shortfall of over 50% in the capital expenditures leading to slippages in the infrastructure development work which in turn put higher pressure on the existing infrastructure. This further jeopardises service provision. The debt service ratio in 2010-11 was 7.1 per cent and it is slated to go up even further once the principal payments for the ADB loan begin in 2015. This will put further pressure on the finances.

2. The revenue model of the Water Supply is on an even more unsustainable footing. The actual recovery of costs through water taxes, charges and state government grants is only about 45%. The collection of water taxes is about 50% of what the minimum should be at the given rates. The major cost item is that of the electricity bills for pumping water up from the Narmada to Indore. Despite the increase in average monthly water taxes per connection to Rs 225 in 2011 the situation has not improved. Revenues from other taxes have to be diverted to compensate partially for the huge deficit in the water supply budget. Consequently the services and infrastructure suffer. The electricity bills are slated to go up astronomically in future as there is pressure on the power distribution companies to recover costs also and this will further aggravate the finances of the water supply sector.

3. The solid waste removal and sewerage sector's finances too are in the red. The deficit in actual finances for 2010-11 was 38% even though in the budget estimates a surplus of 37% had been provided for.

4. The status of the WSS sector is extremely poor. Non revenue water in the water supply system is very high due to leakages and theft. The actual supply is only 243.5 MLD against the design value of 391 MLD. As a consequence the cost of water is also unsustainably high. The water supply from the Narmada is the costliest at Rs 17.76 per 1000 litres while the Yashwant Sagar and Bilawli supply is the cheapest at Rs 2.25 per 1000 litres. The actual average supply is only 113 lpcd as opposed to the norm of 135 lpcd. This too is skewed with 54 per cent of the population receiving piped water supply at 171 lpcd and the rest 46 per cent having to rely on standposts, open wells and handpumps for a supply of 46 lpcd. The poor IMC supply has resulted in a proliferation of private and commercial groundwater supply which has seriously depleted the aquifers in Indore. An affordability analysis shows that the recovery of the full costs of water supply will lead to water taxes constituting 7 per cent or more of the monthly expenditure of 43 per cent of households living above the poverty line assuming that water will be supplied free to those living below it.

5. The waste water system is grossly inadequate and so most of the waste water is disposed of untreated into the streams running through the city which have unacceptable levels of BoD and are highly polluted. There is no proper storm water drainage and since the natural drainages have become blocked due to construction the city suffers from extensive flooding in the monsoons.

6. Despite the pre-project review of the water supply system done by the ADB having clearly shown that the current supply from the Narmada is financially unsustainable no other alternatives were explored for augmenting the system. Instead a third phase of the Narmada supply has been implemented at a huge cost. Later analysis shows that the IERR and FIRR calculated at the time of sanction on the basis of certain

assumptions are grossly inflated. The loan repayment burden is going to be Rs 59 crores annually from 2015 onwards whereas the revenues are still very much in the red and there is no way in which the IMC will be able to garner this huge amount from its own income. This will push the IMC into a severe resource crunch which will not only further aggravate the poor O&M of the water supply and wastewater disposal systems but also affect the other services being provided by the IMC.

7. The poverty pockets in the city which are home to 27 per cent of the population are very poorly served in terms of WSS facilities and given the high cost of these services they are not in any position to pay for them. The special projects for the provision of basic services to the urban poor under the ADB, JNNURM and DFID projects are not being implemented properly and so there is every possibility of further deterioration of the WSS situation in the poverty pockets in future.
8. The detailed analysis of the finances and physical systems of the WSS sector in Indore clearly shows that they are unreliable and unaffordable for a majority of the citizens. They are also financially and socially unsustainable. Consequently both the Green and Brown Agenda are not being fulfilled and neither is their any plan in place to fulfil them in the future.

On the basis of the above review the following recommendations are being made –

1. A Geographical Information System must be used to map all the properties within the municipal limits and then grade them according to zones and building quality for determination of adequate property tax rates. The share of property taxes must increase substantially to at least 30% of revenue receipts and the per capita tax realisation too should reach Rs 700. The tax collection system must be improved drastically and penal measures taken against defaulters.

2. A Proper inventory of the WSS systems in the city has to be prepared including both surface and ground water and the storm and waste water disposal systems. Currently there are radio frequency sensor based instruments and computer softwares to accomplish this quite easily. Only then can an authentic water demand and waste water and storm water generation scenario be chalked out for planning of services. Despite clear directions from the ADB and the CGWA in this regard no progress has been made so far.

3. The use of WSUD principles, which have now been recommended by the National Mission for Sustainable Habitat also, should be used to design a hybrid ground cum surface water system of water supply. This should be augmented by storm water recharge and waste water treatment, reuse and recharge done in a decentralised manner. This hybrid system will be much more sustainable in financial, social and environmental terms than the wholly centralised system being used at present. The centralised systems should be used only where necessary to provide services to the congested poverty pockets where there might not be space available for decentralised solutions.

4. Instead of relying on taxes, user charges and grants to fund hugely expensive centralised systems, this alternative system would put the onus on the more affluent citizens, corporations, private commercial establishments and government institutions who are in possession of a considerable portion of urban land to tackle their water supply and waste water disposal needs in a decentralised manner from their own

resources. This would then free the IMC resources for provision of free or subsidised WSS services to the poor and the lower middle class who are not in a position to pay for them wholly.

5. Detailed surveys and design should be carried out to determine the actual benefit/cost ratio and EIRR and FIRR of such an alternative plan and then compare it with the surface water only alternative that has been implemented so far. Most probably the former will turn out to be more suitable for Indore. If so then this alternative plan should be implemented forthwith.

6. The detailed plan for artificial recharge in the Gambhir and Shipra River Basins drawn up the CGWB should be implemented without any delay so as to improve the overall availability of water in the catchment of Indore city.

7. Solar power should be used for the Narmada water supply.

References

ADB. *Report and Recommendation Of the President To the Board of Directors On a Proposed loan To India For the Urban Water Supply and Environmental Improvement In Madhya Pradesh Project*. Manila: Asian Development Bank, 2004.

AME. *Indore Urban Environmental Handbook 2001*. Delhi: Academy of Mountain Environics, 2004.

Bahl, Roy W and Johannes F. Linn. *Urban Public Finance in Developing Countries*. Oxford: Oxford University Press, 1992.

Batra, S P, Tyagi, C and Tyagi M. *Districtwise Poverty Estimates for Madhya Pradesh*, State Planning Commission, Madhya Pradesh. nd.

CAG. Annual Report of the Finances of the Union Government 2005. Comptroller and Auditor General of India. 2011. Web. 21 March <http://saiindia.gov.in/cag/sites/default/files/civil/2006_1/chapter4.pdf>

Castro, J.E. *Poverty and citizenship: Sociological perspectives on water services and public–private participation*, Geoforum 38 (2007) 756–771

CGWB. "District Profile Indore." *Central Groundwater Board.* 2011. Web. 15 March. <http://cgwb.gov.in/District_Profile/MP/indore.pdf>

CGWB. *Master Plan for Artificial Recharge to Groundwater in India*. Central Groundwater Board. 2010. Web. 11 October. <cgwb.gov.in/documents/MASTER%20PLAN%20Final-2002.pdf>

CPCB. Central Pollution Control Board. 2011. Web. March 14. <http://cpcbenvis.nic.in/waterpollution/riverstretches.htm>

CPHEEO Manual on Water Supply & Treatment, Ministry of Urban Development published in May, 1999

Clarke, T. (Ed.),. *International Privatization: Strategies and Practices.* Berlin: Walter de Gruyter, 1994

Crenzel, E., Forte, G., 2004. *Cross-comparative report on the socioeconomic and demo-geographic dimension.* In: Castro, J.E. (Coord.), PRINWASS Project. University of Oxford, Oxford.

Dainik Bhaskar. *Panch saal mein 37000 boring. Indore*. May 17 2010.

Dixit M 2011 Hindutan Times Live February 20 Decks to be Cleared for hike by Discoms.

DTCPGoMP. *Indore Development Plan 2021*. Bhopal: Directorate of Town and Country Planning Government of Madhya Pradesh, 2008.

Dwivedi, G. *Public Private Partnerships in Water Sector: Partnership or Privatisation.* Barwani: Manthan, 2010.
FIRE-D. *Increasing Municipal Revenues: Indore Municipal Corporation.* 2005. USAID New Delhi.
Geddes, P, *Report to the Durbar of Indore*. Indore: Holkar State, 1918. Vol I.
George, R, Rajeev, B and T. Sarwal. *Poverty and Vulnerability in Indore: A Report.* Nagpur: Oxfam India, 1998.
Geddes, P. *Town Planning Towards City Development: A Report.* Indore, 1918.
Heal, G . *Nature and the Marketplace: Capturing the Value of Ecosystem Services*. Washington: Island Press, 2000.
Howard, A. *An Agricultural Testament.* London: Oxford UP, 1940.
HT *Mumbai firm offers solar power for Narmada Project* may 16 2012 Indore
HT Pollution on rise in city, project in Doldrums, july 16 2012 Indore
HT Live I. *Authority for Freezing Extraction of Groundwater*. Hindustan Times Indore Live, January 10 2009.
HT Live II. *31 MLD: Where has Water Gone?* Hindustan Times Indore Live, January 16 2011.
HT Live III. *IMC Plans to Set Tax Collection Targets*. Hindustan Times Indore Live, February 21, 2010.
HT Live IV. *Power Woes Delay Dry Run*. Hindustan Times Indore Live, December 14 2009.
HT Live V. *IMC Sets Timelines Ahead of Review Meet*. Hindustan Times Indore Live, January 22 2010.
HT Live VI. *IMC to Pay Rs 552 Crore ADB Loan*. Hindustan Times Indore Live, August 24 2010.
HT Live VII. *Cops Top List of Water Tax Defaulters.* Hindustan Times Indore Live, February 15 2009.
HT Live VIII. *Narmada Power to Cost More*. Hindustan Times Indore Live, March 23 2010.
HT Live IX. *MPERC Relief to Narmada - III*. Hindustan Times Indore Live, February 7 2010.
HT Live X. *An Oasis in Parched Land: Thousand Tankers ply daily from Niranjanpur in Indore for a Decade*. Hindustan Times Indore Live, March 18 2009.
HT Live XI. *Farmers Warn of Another Singur*. Hindustan Times Indore Live, May 15 2010.
HT Live XII. *24x7 Water Possible Only with Government Aid*. Hindustan Times Indore Live, May 6 2010.
HT Live XIII. *Expert Favours Decentralised Waste Disposal System*. Hindustan Times Indore Live, Dec 1 2010.
HT Live XIV. *Trenching Ground An Ozone Hazard*. Hindustan Times Indore Live, April 25 2010.
HT Live XV. *Urban Work Edges Out Basic Services for Poor*. Hindustan Times Indore Live, April 11 2011.
HT Live XVI. *Most of Tubewell Water Samples Contaminated*. Hindustan Times Indore Live, April 22 2009.
Howard, A. *An Agricultural Testament.* London: Oxford University Press, 1940.
JNNURM *Overview: Jawaharlal Nehru National Urban Renewal Mission*, Delhi: Ministry of Urban Development & Ministry of Urban Employment and Poverty Alleviation, Government of India. 2005.
(JNNURM) http://jnnurm.nic.in/primers.html
Joshi, D. *Caste, Gender and the Rhetoric of Reform in India's Drinking Water Sector.* Economic and Political Weekly Vol 46 No 18 pp 56-63.
Khan S 2008. *Unquiet flows the Narmada*. Hindustan Times Indore Live. 2008 December 24.

Khan S 2011. *Home Truths.* Hindustan Times Indore. 2011 August 30.
Khan S 2011. *Monthly Water Bills to go up to Rs 600* Hindustan Times October 20 Indore.
Khan S 2012. *Simplex Accuses IMC of refusing payments* HT Indore July 6
Khan S 2012. *Home Truths* HT Indore Aug 30
Khan S 2012. *Bored to Death?* HT Indore Aug 31
Krishnamurthy, A, Stell, N, Ramachandran, S, Singh, K and Sunil, M.S. *When Pigs Fly: Citizens at the Centre of Integrated Urban Water Management.* Bangalore: Biome, not dated.
Leitmann, J. *Sustaining Cities: Environmental Planning and Management in Urban Design.* New York: McGraw-Hill, 1999.
McGrahanan, Gordon and David Satterthwaite. *"*Environmental health or ecological sustainability? Reconciling the brown and green agendas in urban development*',* in Cedric Pugh (ed) *Sustainable Cities in Developing Countries*. London: Earthscan, 2000
Perry, G.E., Ferreira, Francisco, H.G., Walton, M., 2003. Inequality in Latin America and the Caribbean: Breaking with History? World Bank, Washington.
Mahadevia, D. *Sustainable Urban Development in India: An Inclusive Perspective.* Development in Practice, Volume 11 Numbers 2 & 3 May 2001 242-259
Mahadevia, D. *Globalisation, Urban Reforms and Metropolitan Response: India.* New Delhi: Manak, 2003.
Mahadevia, D. *Branded and Renewed? Policies, Politics and Processes of Urban Development in the Reform Era.* Economic and Political Weekly, Vol 46 No 31 56-64
Mathur O.P. and Ray, S. 2004. *Financing Municipal Services: Reaching Out to Capital Markets.* New Delhi. NIPFP.
M.H. Mehaffey, M.S. Nash, T.G. Wade, C.M. Edmonds, D.W. Ebert, K.B. Jones, and A. Rager. *A Landscape Assessment of the Catskill/Delaware Watersheds 1975-1998.* New York: Environment Protection Agency, 2001.
MGI. *India's Urban Awakening:Building Inclusive Cities,Sustaining Economic Growth.* New York. Mckinsey Global Institute, 2010.
Mekaad, S. *And Now a Reserve Bank of Water*. Hindustan Times Indore Live, March 22 2009.
Mkandawire T. "Social Policy in a Development Context". United Nations research Institute for Social Development, Social Policy and Development Programme Paper Number 7, June 2001.
MP Govt. *Madhya Pradesh Bhoomi Vikas Rules 1984*. Indore: India Law House, 2010.
NIPFP. *Property Tax Potential in India.* New Delhi: National Institute of Public Finance and Policy, 2009.
NIUA. "Role of NIUA". *National Institute of Urban Affairs.* 2011. Web. 11 March. http://www.niua.org/fire_role.asp
NMSH *Sustainable Habitat for Urban Areas* 2011
NSSO. *Report No. 508: Level and Pattern of Consumer Expenditure, 2004-05.* Delhi: National Sample Survey Organisation, 2006.
Parmar, A.S. *Mercury is Up, Water Crisis is in*. Hindustan Times Indore Live. March 19 2011.
Patnaik, U. *Trends in Urban Poverty under Economic Reforms:1993-94 to 2004-2005.* Economic and Political Weekly, Vol XLV No 4. 2010.

Planning Commission. *Guidelines Financial Support to Public Private Partnerships in Infrastructure.* New Delhi: The Secretariat for the Committee on Infrastructure, Planning Commission, 2002.

Ranganathan, M, Kamath, L and Vaindur, B. *Piped Water Supply to Greater Bangalore: Putting the Cart Before the Horse?*, Mumbai. Economic and Political Weekly, Vol 44 No 33, 2009.

Sekhar, S and Bidarkar, S. *Municipal Budgets in India: Comparison Across Five Cities.* Mumbai. Economic and Political Weekly, May 15, 1999.

Sridhar, K S. *Reforming Delivery of Urban Services in Developing Countries: Evidence from a Case Study in India*. National Institute of Public Finance and Policy. New Delhi. n.d.

Sridhar, Kala S., O. P. Mathur, and A. Nandy, 2006. *Costs of UrbanInfrastructure: Evidence from India's Cities,* South Asia Network of Economic Research Institutes and Global Development Network.

Sridhar, Kala S. and O. P. Mathur. *Pricing Urban Water: A Marginal Cost Approach.* in India Infrastructure Report 2011.

Stiglitz, J.E., 2002. Globalization and its Discontents. Penguin, London.

TERI. *Water Demand Management Strategy and Implementation Plan for Indore.* New Delhi: The Energy Resource Institute, United Nations Human Settlements Programme, 2006.

UNEP. "Promoting Sustainable Human Settlement Development." *United Nations Environment Programme.* 2010. Web. 9 October. <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=52&ArticleID=55&l=en>

UNFCCC. "Feeling the Heat." *United Nations Framework Convention on Climate Change.* 2010. Web. 13 November 2010. <http://unfccc.int/essential_background/feeling_the_heat/items/2914.php>

UN HABITAT. *Planning Sustainable Cities: Policy Directions (Global Report on Human Settlements 2009).* London: Earthscan, 2009.

United Nations Organisation. *Our Common Future*. Oxford: Oxford University Press, 1987.

----------. "Sustainable Cities Programme." *United Nations Human Settlements Programme.* 2010. Web. 10 December. http://www.unhabitat.org/content.asp?cid=5025&catid=540&typeid=19&subMenuId=0

UN Millennium Project *A Home in the City,* United Nations Millennium Project, Task Force on Improving the Lives of Poverty pocket Dwellers. London: Earthscan, 2005

Vikas Mitra Drishti 2050.

Water Aid. Poverty Pocket Situational Analysis (PPSA) – An Intra City Comparison. 2006

Williamson, J.G. (1988), 'Migration and Urbanization', in Hollis Chenery and T.N. Srinivasan (eds) Handbook of Development Economics, Vol. I, North Holland,Amsterdam.

World Bank, 1998. Facilitating Private Involvement in Infrastructure: an Action Programme. World Bank, Washington, DC.

World Bank, 2003. World Development Report 2004: Making Services Work for Poor People. World Bank, Washington, DC.

World Bank. *India Water Supply and Sanitation: Bridging the Gap between Infrastructure and Services.* Delhi: World Bank, 2006.

World Bank. *Country Strategy for India, Report No. 29374-IN.* New Delhi: India Country Management Unit, South Asia Region, 2004

World Bank. *Country Strategy for India, Report No. 46509-IN*. New Delhi: India Country Management Unit, South Asia Region, 2008.

Annexure: Indore Municipal Corporation Budget Estimate Data

The budget estimate data for the IMC over the years 2006-07 to 2010-11 are given in the tables below.

Table A1 : IMC Budget Estimates of Total Income and Expenditure 2006-07 to 2010-11

Item	2006-07	2007-08	2008-09	2009-10	2010-11
Receipts (Rs Lakhs)	72318.55	86167.29	109523.68	134054.32	151709.38
Per Capita Receipts (Rs)	4065.57	4723.41	5857.77	6999.59	7737.7834
Nominal Growth Rate (%)		19.15	27.11	22.40	13.17
Real Growth Rate (%)		12.75	18.81	11.5	1.47
Expenditures (Rs Lakhs)	73616.95	86963.01	110019.01	134339.84	151713.54
Per Capita Expenditures (Rs)	4138.57	4767.03	5884.26	7014.50	7738.00
Nominal Growth Rate (%)		18.13	26.51	22.11	12.93
Real Growth Rate (%)		11.73	18.21	11.21	1.23
Transfer to Reserves (Rs Lakhs)	1811.67	1866.39	2378.75	3146.37	3748.87
Deficit (Rs Lakhs)	-3110.07	-2662.11	-2874.08	-3431.89	-3753.03
Fiscal Deficit	-15258.84	-24638.9	-23035.61	-23824.87	-20474.02
Fiscal Deficit/Income (%)	25.82	39.38	26.26	21.34	15.44

Source: IMC Budgets 2006-07 to 2010-11

Table A2 : IMC Budget Estimates of Revenue Income and Expenditure 2006-07 to 2010-11

Item	2006-07	2007-08	2008-09	2009-10	2010-11
Revenue Receipts (Rs Lakhs)	36233.39	37327.75	47574.97	62927.31	74977.35
Revenue Receipts per capita (Rs)	2035.58	2045.356	2544.12	3286.02	3825.38
Nominal Growth Rate (%)		3.02	27.45	32.27	19.15
Real Growth Rate (%)		-3.38	19.15	21.37	7.45
Revenue Expenditure (Rs Lakhs)	27654.07	26602.77	29406.40	38504.34	52142.94
Revenue Expenditure per capita (Rs)	1553.60	1457.686	1572.53	2010.67	2660.35
Nominal Growth Rate (%)		-3.80	10.54	30.94	35.42
Real Growth Rate (%)		-10.2	2.24	20.04	23.72
Revenus Surplus (Rs Lakhs)	8579.32	10724.98	18168.57	24422.97	22834.41
Surplus/Receipts (%)	23.68	28.73	38.19	38.81	30.46

Source: IMC Budgets 2006-07 to 2010-11

Table A3 : IMC Budget Estimates of Capital Income and Expenditure 2006-07 to 2010-11

Items		2006-07	2007-08	2008-09	2009-10	2010-11
Capital Receipts	Loans (Rs Lakhs)	13224.12	23606.01	21790.71	22400.01	19128.01
	Grants (Rs Lakhs)	22861.04	25233.53	40158.00	48727.00	57604.02
	Prop. of Loans (%)	36.65	48.33	35.18	31.49	24.93
Capital Receipts per Capita (Rs)		2027.26	2676.139	3312.77	3714.20	3914.90
Nominal Growth Rate (%)			35.35	26.84	14.82	7.88
Real Growth Rate (%)			28.95	18.54	3.92	-4.18
Capital Expenditure (Rs Lakhs)	Loans	1075.35	1629.18	1629.18	2007.03	2407.02
	Assets	44887.53	58731.06	78983.43	93828.47	97163.58
Capital Expenditure per capita (Rs)		2582.18	3307.41	4310.83	5004.46	5080.13
Nominal Growth Rate (%)			31.32	33.55	18.88	3.90
Real Growth Rate (%)			24.92	24.25	7.98	-8.20
Capital Deficit (Rs Lakhs)		-9877.72	-11520.70	-18664.6	-3431.88	-3753.03
Capital Receipts/Revenue Receipts (%)		99.59	130.84	130.21	113.03	102.34
Interest Payments (Rs Lakhs)		1207.92	785.06	1555.72	3964.06	3789.06
Debt Service Ratio (%)		8.26	9.08	10.83	15.51	11.88

Source: IMC Budgets 2006-07 to 2010-11

Table A4 : IMC Category wise Budget Estimates of Revenue Income 2006-07 to 2010-11

	2006-07		2007-08		2008-09		2009-10		2010-11	
Category	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)
Property Tax	2445.00	6.75	3400.00	9.11	4250.00	8.93	7900.00	12.55	9500.00	12.67
Water Tax	4436.00	12.24	4004.00	10.73	6725.01	14.14	7766.01	12.34	9674.50	12.90
Drainage & Cleanliness Tax	3326.50	9.18	3380.00	9.05	4265.32	8.97	7555.00	12.01	9506.00	12.68
Water Recharge & Plantation Tax	220.10	0.61	275.00	0.74	296.26	0.62	404.21	0.64	507.20	0.68
Octroi Compensation	10900.00	30.08	11000.00	29.47	11860.00	24.93	17300.00	27.49	18400.00	24.54
Export Tax	1000.00	2.76	100.00	0.27	500.00	1.05	1000.00	1.59	1000.00	1.33
Advertisement, Cable and Show Taxes	532.50	1.47	710.00	1.90	1231.00	2.59	981.00	1.56	1180.00	1.57
Passenger Tax Comp.	379.00	1.05	379.00	1.02	399.00	0.84	619.00	0.98	719.00	0.96
Tax Surcharges	3503.02	9.67	3268.00	8.75	4318.00	9.08	5768.00	9.17	7168.00	9.56
Sub-Total Tax Income	**26742.1**	**73.81**	**26516**	**71.04**	**33844.6**	**71.14**	**49293.2**	**78.33**	**57654.7**	**76.90**
Building Permission, Colony Development and Transfer of Property Fees	4402.00	12.15	3310.00	8.87	6631.00	13.94	5860.00	9.31	8001.00	10.67
Rent	1240.87	3.42	813.74	2.18	1373.50	2.89	1218.86	1.94	1341.80	1.79
Licenses	319.31	0.88	379.29	1.02	530.41	1.11	553.12	0.88	560.32	0.75
Penalties	347.85	0.96	423.00	1.13	475.00	1.00	170.00	0.27	75.00	0.10
Other Fees & Misc.	278.58	0.77	3141.67	8.42	861.45	1.81	790.08	1.26	1849.19	2.47
Interest	203.61	0.56	184.00	0.49	254.00	0.53	354.00	0.56	754.00	1.01
Sub-Total Non-Tax Income	**6792.22**	**18.75**	**8251.70**	**22.11**	**10125.36**	**21.28**	**8946.06**	**14.22**	**12581.31**	**16.78**
Sub-Total Own Source Income	**33534.3**	**92.55**	**34767.7**	**93.14**	**43970**	**92.42**	**58239.3**	**92.55**	**70236.01**	**93.68**
Central Grants	511.02	1.41	500.00	1.34	700.00	1.47	900.00	1.43	1000.00	1.33
Narmada Salary Grant	950.03	2.62	910.00	2.44	1210.00	2.54	938.00	1.49	2076.34	2.77
Other State Grants	1238.00	3.42	1150.05	3.08	1695.02	3.56	2850.03	4.53	1665.00	2.22
Sub-Total Grant Income	**2699.05**	**7.45**	**2560.05**	**6.86**	**3605.02**	**7.58**	**4688.03**	**7.45**	**4741.34**	**6.32**
Total	**36233.39**	**100.00**	**37327.75**	**100.00**	**47574.97**	**100.00**	**62927.31**	**100.00**	**74977.35**	**100.00**

Source: IMC Budgets 2006-07 to 2010-11

Table A5 : IMC Budget Estimates of Category wise Revenue Expenditures 2006-07 to 2010-11

Items	2006-07		2007-08		2008-09		2009-10		2010-11	
Category	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)
Other Water Supply (OWS) O & M	800.70	2.90	656.25	2.47	868.60	2.95	1897.10	4.93	2400.00	4.60
Salaries for OWS	617.17	2.23	537.44	2.02	531.49	1.81	611.86	1.59	623.86	1.20
Electricity for OWS	471.00	1.70	499.00	1.88	551.00	1.87	791.00	2.05	1131.00	2.17
Narmada Water Supply (NWS) O & M	1056.00	3.82	1530.49	5.75	1858.00	6.32	695.50	1.81	2243.35	4.30
Salaries for NWS	1204.35	4.36	936.00	3.52	1120.00	3.81	2613.00	6.79	2351.34	4.51
Electricity for NWS	5000.00	18.08	5200.00	19.55	6000.00	20.40	6100.00	15.84	14700.00	28.19
Water Tanker & Emergency Supply	320.00	1.16	270.00	1.01	360.00	1.22	720.00	1.87	720.00	1.38
Sub-Total Water Supply	**9469.22**	**34.24**	**9629.18**	**36.20**	**11289.09**	**38.39**	**13428.46**	**34.88**	**24169.55**	**46.35**
Sanitation & Solid Waste	533.85	1.93	503.92	1.89	698.50	2.38	739.50	1.92	977.26	1.87
Sewerage & Stormwater	393.00	1.42	356.00	1.34	397.78	1.35	1879.61	4.88	1186.56	2.28
Salaries	2007.54	7.26	2105.67	7.92	2631.69	8.95	3215.00	8.35	3560.00	6.83
Sub-Total Sanitation	**2934.39**	**10.61**	**2965.59**	**11.15**	**3727.97**	**12.68**	**5834.11**	**15.15**	**5723.82**	**10.98**
Water Recharging and Plantation	155.00	0.56	330.43	1.24	563.56	1.92	456.56	1.19	465.05	0.89
Streetlighting	721.00	2.61	691.00	2.60	1598.00	5.43	1282.00	3.33	1307.00	2.51
Roads	685.00	2.48	637.00	2.39	1485.69	5.05	930.60	2.42	1546.00	2.96
Salaries	4316.62	15.61	4302.3	16.17	4280.37	14.56	5516.62	14.33	6326.60	12.13
Interest	1207.92	4.37	785.06	2.95	1555.72	5.29	3964.06	10.30	3789.06	7.27
Miscellaneous	8164.92	29.53	7262.21	27.30	4906.00	16.68	7091.93	18.42	8814.86	16.91
Total	**27654.07**	**100.00**	**26602.77**	**100.00**	**29406.40**	**100.00**	**38504.34**	**100.00**	**52142.94**	**100.00**

Source: IMC Budgets 2006-07 to 2010-11

Table A6 : IMC Budget Estimates of Category wise Capital Receipts 2006-07 to 2010-11

Category	2006-07		2007-08		2008-09		2009-10		2010-11	
	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)
Infrastructure	5000.08	13.86								
ADB	7824.00	21.68	19560.00	40.05	19740.00	31.87	17600.00	24.74	14428.00	18.80
Infrastructure	400.04	1.11	550.00	1.13	550.01	0.89	300.01	0.42	300.00	0.39
JNNURM		0.00	3496.00	7.16	1500.00	2.42	4500.00	6.33	4400.00	5.73
Sub-Total Loans	**13224.10**	**36.65**	**23606.00**	**48.33**	**21790.01**	**35.17**	**22400.01**	**31.49**	**19128.01**	**24.93**
Central JNNURM	9550.00	26.47	9877.00	20.22	19512.00	31.50	24639.00	34.64	27173.00	35.41
State JNNURM	3820.00	10.59	3950.00	8.09	6804.00	10.98	10229.00	14.38	16621.00	21.66
Other State Govt. Grants	6626.03	18.36	8386.53	17.17	8007.00	12.93	4714.00	6.63	4923.00	6.42
Other Central Govt. Grants	860.01	2.38	1970.00	4.03	1175.00	1.90	1945.00	2.73	1060.00	1.38
People's Contribution	305.00	0.85	550.00	1.13	500.00	0.81	900.00	1.27	925.00	1.21
Others	1700.00	4.71	500.00	1.02	4160.00	6.72	6300.00	8.86	6902.02	8.99
Sub-Total Grants	**22861.04**	**63.35**	**25233.50**	**51.67**	**40158.00**	**64.83**	**48727.00**	**68.51**	**57604.02**	**75.07**
Total	**36085.14**	**100.00**	**48839.50**	**100.00**	**61948.01**	**100.00**	**71127.01**	**100.00**	**76732.03**	**100.00**

Source: IMC Budgets 2006-07 to 2010-11

Table A7 : IMC Budget Estimates of Category wise Capital Expendituress 2006-07 to 2010-11

Item	2006-07		2007-08		2008-09		2009-10		2010-11	
	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)	Bud. Est. (Rs Lakhs)	Prop. of Total (%)
Sewerage and Storm Water	7049.50	15.34	9473.00	15.69	16213.00	20.11	17174.00	17.92	18715.00	18.80
Solid Waste	745.00	1.62	1038.00	1.72	3933.01	4.88	4110.29	4.29	2926.02	2.94
Water Supply	12680.10	27.59	27845.00	46.13	34475.89	42.77	25354.98	26.46	19056.45	19.14
Roads	10667.01	23.21	8780.00	14.55	12439.00	15.43	24686.00	25.76	32663.00	32.80
Streetlighting	330.00	0.72	106.00	0.18	566.02	0.70	1193.99	1.25	1121.00	1.13
Water Recharging and Plantation	1025.00	2.23	520.00	0.86	360.00	0.45	2271.51	2.37	1885.00	1.89
Poverty Pocket Development		0.00	2000.00	3.31	6300.00	7.82	8623.48	9.00	9407.00	9.45
Miscellaneous	12390.92	26.96	8969.10	14.40	4696.51	5.83	10414.22	10.87	11390.11	11.44
Loan Repayments	1075.35	2.34	1629.2	2.70	1629.18	2.02	2007.03	2.09	2407.02	2.42
Total	**45962.88**	100.00	**60360.30**	100.00	**80612.61**	100.00	**95835.50**	100.00	**99570.60**	100.00

Source: IMC Budgets 2006-07 to 2010-11