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Problems and Issues in Urban Environmental Management Experiences of Ten Best Practices



Human Settlement Management Institute (HUDCO), New Delhi,
India



Institute for Housing and Urban Development Studies, Rotterdam,
The Netherlands.

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CAPACITY BUILDING FOR THE URBAN ENVIRONMENT PROJECT

A Comparative Research, Training and Experience Exchange Project

PROBLEMS AND ISSUES IN URBAN ENVIRONMENTAL MANAGEMENT Experiences of Ten Best Practices

Prepared by

BN Singh
Shipra Maitra
Rajiv Sharma

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Human Settlement Management Institute (HUDCO), New Delhi, India.



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ABOUT THE PROJECT

The Human Settlement Management Institute (HSMI) of HUDCO, New Delhi in collaboration with Institute of Housing and Urban Development Studies (IHS), Rotterdam initiated in October, 1994 the Government of Netherlands assisted collaborative research project "Capacity Building for the Urban Environment: A Comparative Research, Training and Experience Exchange".

The two main objectives of the project are the development of National Capacity Building Strategies to improve the urban environmental management in India and review and sharing of international experiences.

The focus of the project is on capacity building at the local level. With this end in view, ten examples of "best practices" of urban environmental management were taken up for study and research by various lead research institutions, based on which an outline of National Capacity Building Strategies to improve the urban environment have been formulated and developed under the project for wider dissemination.

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Foreword

This document is a synthesis of environmental problems and issues emerging out of the studies on ten *best practices* in urban environmental management in India. The document is cast in a synthesised framework so that wider issues of urban environment can become more discernible. Building on the research efforts, the present document provides a stock of knowledge on the subject of urban environmental management.

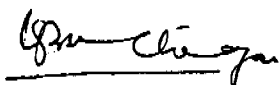
The document drew out of the result of a collaborative research project between HSMI, New Delhi, and IHS, Rotterdam, firstly, on the research studies through lead research institutions on ten identified *best practices* and, secondly, on the findings of two Expert Group Meetings at Chandigarh and Manesar followed by a National Forum held in January, 1996 to deliberate on the research findings and evolving National Capacity Building Strategies. HSMI has prepared this document which remains the joint contribution of the two collaborating institutions, for a comparative experience exchange, with similar projects in Peru, Bolivia and Senegal. It is hoped that the document will contribute in sharing knowledge and experience about urban environmental concerns .

The Second Expert Group Meeting at Manesar and the National Forum at New Delhi, organised by HSMI, brought together policy makers, representatives of governmental agencies, non-governmental organisations, research institutions and many other professional practioners in a three day meeting followed by a plenary session in the National Forum. The lessons of research studies provided valuable insight into the issues of urban environmental management providing commonality in drawing up strategies for capacity building.

The document also provides a broad framework on environmental strategies and action plans based on well documented case studies on *best practices*. The document reviews the substantive results from the various issues arising out of the research studies on ten *best practices*. The document has drawn conclusions that capacity building strategies for urban environmental management has its attributes related to (i) Strengthening urban governance (ii) Integrating Environmental Planning and Management (iii) Evolving a Local Area Development Agenda (iv) Building of Urban Institutional Capacities (v) Awareness and involvement of Community (vi) Promoting Partnerships (vii) Capacity Building of Actors and Stakeholders and (viii) Replication of Best Practices.

The project upon which the document is based represents a new phase in the activities of HSMI of HUDCO and research support by IHS. It is hoped that this document will contribute to the understanding and hence solutions to the problems of urban environmental management besetting our urban areas.

New Delhi
May, 1996


KK Bhatnagar
Chairman & Managing Director,
HUDCO

Preface

This volume brings together a general overview of some of the most important urban environmental issues analysed through a series of supporting research studies on individual aspects of identified ten *best practices* in India. The document has been designed to provide a context and perspective in the form of strategies for consideration of those urban environmental issues which most clearly impinge on the preparation of Local Agenda 21. The analysis presented in the document should be of interest to a much wider audience than those directly involved in the cases studied. It is the final product of the project "Capacity Building for the Urban Environment" jointly sponsored by HSMI, New Delhi and IHS, Rotterdam. The document is in three parts.

Part I provides a background of the project and describes its process, the scope and context of Habitat II Conference for which the document has been prepared.

Part II relates to an analysis of ten *best practices* identifying and prioritising the urban environmental issues and involvement of stakeholders. It analyses the institutional setting for urban environmental management focussing on key actors, management functions and coordination and decision making in inter-sectoral perspective for empowering the citizens under a legal and regulatory framework. It also deals with partnerships - CBOs, NGOs, local governments, private sector enterprises, state and national government. Gender aspects of urban environmental management have been studied under a separate section. Towards the end of this part, lessons and experiences drawn out of the cases for developing capacity building strategies for the urban environmental management have been brought out specifically.

Part III outlines National Capacity Building Strategies based on the conclusions drawn out of the ten *best practices* with particular relevance to sustainable urban development.

Capacity building for urban environmental management implies building technical, financial and managerial capabilities and upgrading the institutional and technical capacities of key actors. As a follow up of the above mentioned project, there is a need to operationalise the strategies as evolved through the research studies on "best practices" at the local level with a view to strengthen the capacity building of the concerned institutions in urban environmental management. The project would thus have a concrete impact on institutional capacities in urban environmental management.

New Delhi
May, 1996


Dr. Kulwant Singh
Executive Director, HSMI

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The successful completion of this document is a result of contributions made by many individuals and institutions. First and foremost has been the support extended to us by ten research institutions. The principal researchers were: Shri RM Kapoor, Times Research Foundation, Calcutta; Dr. Dinesh Mehta, National Institute of Urban Affairs, New Delhi; Dr. Yogesh Kumar, Development Associates, Lucknow; Dr. Bindeshwar Pathak, Sulabh International Institute of Technical Research and Training, New Delhi; Shri JC Kala, Ministry of Environment and Forests, New Delhi; Dr. (Mrs) K Vijaya Lakshmi, Development Alternatives, New Delhi; Dr. PK Saha, Institute of Wetland Management and Ecological Design, Calcutta; Shri GS Gill, City and Industrial Development Corporation, Mumbai and Shri Himanshu Parikh, Ahmedabad. The seriousness with which they completed the studies, the analysis of the case studies they provided characterise the high quality of the results. We are grateful to the principal researchers, their associates and the institutions for their contributions.

This initiative could not have been succeeded without the Dutch financial support extended through IHS, Rotterdam. IHS played a pivotal role by collaborating with HSMI in the launching of this project and bringing it to this stage. Useful and constructive inputs were received from Mr. Ed Frank, and Ms Marijk Huysman, IHS in all stages of the project and their contributions are thankfully acknowledged. Dr. Florian Steinberg, Project Leader, Indian Human Settlement Programme was deeply involved with the research study process and made significant contribution in going through the draft and making valuable suggestions for its finalisation. We are indebted to the Project Advisory Committee (PAC) members - Shri KK Bhatnagar, CMD, HUDCO, Shri AP Sinha, Joint Secretary, Ministry of Urban Affairs and Employment, Dr. S Maudgal, Senior Adviser, Ministry of Environment and Forests, Dr. PS Rana, Executive Director (Infrastructure), Dr. Kulwant Singh, Executive Director, HSMI and Shri B.N. Singh, Project Coordinator - who were kind enough to come together at short notices during the entire project period in providing directions to this Project. Shri KK Bhatnagar, CMD, HUDCO as Chairman of PAC, provided the dynamic leadership in meeting the milestones of the Project. Our appreciation goes to the participants of Expert Group Meetings and National Forum, the Discussants and the Experts, without whose willing contributions and inputs, the document could not have been completed.

We are particularly grateful to Dr. Kulwant Singh, for extending all possible support and facilities for carrying out project related activities and meeting the deadlines. The secretarial assistance of T Balaji and Mohinder Singh cannot be undervalued in this whole exercise. Finally, the contributions and sustained efforts made by the project team comprising Shri BN Singh, Project Coordinator, Dr. Shipra Maitra, Research Coordinator and Shri Rajiv Sharma, Project Associate and Training Coordinator are acknowledged in bringing this document to this shape.

Abbreviations

ALOs	Area Level Organisations		Corporation
APMC	Agriculture Produce Market Committee	ICDP	The Ganga Institutional and Community Development Project
AWW	Anganwadi Workers	ICDS	Integrated Child Development Scheme
BCC	Baroda Citizens Council	IDA	Indore Development Authority
BMC	Bombay Municipal Corporation	IDP	Indo-Dutch Project
BMRDA	Bombay Metropolitan Region Development Authority	IHS	Institute for Housing and Urban Development Studies
BOD	Biological Oxygen Demand	IDSMT	Integrated Development of Small and Medium Towns
BOT	Build, Operate and Transfer	IWMED	Institute of Wetland Management & Ecological Design
BPMCA	Bombay Provincial Municipal Corporation Act	KAP	Knowledge, Attitudes, Practices
CAA	Constitution Amendment Act	Kcal/Kg	Kilo calories per kilogram
CBO	Community Based Organisation	KJS	Kanpur Jal Sansthan
CD	Community Development	Km.	Kilometre
COD	Chemical Oxygen Demand	KWHR	Kilowatt Hour
CHW	Community Health Workers	LCS	Low Cost Sanitation
CIDCO	City & Industrial Development Corporation	LPCD	Litres per Capita per Day
CLRI	Central Leather Research Institute	MCGB	Municipal Corporation of Greater Bombay
CPCB	Central Pollution Control Board	MEIP	Metropolitan Environment Improvement Programme
CV	Community Volunteer	MIS	Management Information System
CW	Community Worker	MoEF	Ministry of Environment and Forests
DST	Department of Science and Technology	MoUAE	Ministry of Urban Affairs and Employment
EIMS	Environmental Management Information System	NCR	National Capital Region
EIUS	Environmental Improvement of Urban Slums	NGO	Non-Governmental Organisations
EWS	Economically Weaker Section	NH	National Highway
GAP	Ganga Action Plan	NMMC	Navi Mumbai Municipal Corporation,
GF	Garbage Farm	NPK	Nitrogen Phosphorous Pottasium fertilizer
GPD	Ganga Project Directorate	NRAP	National River Action Plan
HDFC	Housing Development and Finance Corporation	NRY	Nehru Rojgar Yojna
HQ	Headquarters	ODA	Overseas Development Administration
HSMI	Human Settlement Management Institute	PMC	Private Municipal Contractor
HUDCO	Housing and Urban Development	PMP	Private Medical Practitioner
		RCV	Resident Community Volunteer

Rs. (Rupee)	Indian Currency (1\$ = Rs.35)	UBSP	Urban Basic Services for Poor
SEWA	Self Employment Women's Association	UCD	Urban Community Development
STF	Sewage Treated Fishery	UIFW	Urban Infrastructure Finance Wing
SWM	Solid waste management	ULC	Urban Land Ceiling Act
TBIA	Thane-Belapur Industries' Association	UMP	Urban Management Programme
TPS	Town Planning Scheme	UNDP	United Nations Development Programme
UASB	Upflow Anaerobic Sludge Blanket	UNICEF	United Nations Children's Fund
		WMC	Waste Management Cell

I. Background

INTRODUCTION

1.1 The Human Settlement Management Institute (HSMI) of HUDCO, New Delhi in collaboration with Institute for Housing and Urban Development Studies (IHS), Rotterdam initiated in October, 1994 the Government of Netherlands assisted collaborative research project "Capacity Building for the Urban Environment: A Comparative Research, Training and Experience Exchange". Its output will contribute to the Second United Nations Conference on Human Settlements, Habitat II,¹ scheduled to take place in Istanbul from June 3-14, 1996.

1.2 The two main objectives of the project are the development of National Capacity Building Strategies to improve urban environmental management in India and the review and sharing of international experiences in India, Peru, Bolivia and Senegal. Capacity building strategies at the city level can only be effective when they involve all local actors concerned and are based on positive examples of how to improve city environment. It is for these reasons that a comparative research, training and experience exchange programme forms part of this project. The focus of the project is on capacity building at the local level. With this end in view, ten best practices of urban environmental management in India were taken up for study and research by various leading Indian research institutions/organisations. The project attempts to consolidate various examples of best practices of environmental management, having impact at the city level, with potential of scaling up and wider replication.

1.3 The research studies under the project have led to the identification of the most important city level issues of urban environmental management. Based on local experiences and best practices, national capacity building strategies to improve the urban environment have been formulated and developed under the project for wider dissemination. The project has gained its strength through the research studies on selected themes launched following the First Expert Group Meeting held at Chandigarh in January, 1995. The research studies provide an indepth analysis of fewer and yet vital dimensions of urban environmental management. The project will also contribute to the establishment of national networks of organisations of different background and experiences, which can further share and contribute to improving urban environmental conditions.

BEST PRACTICES AND THE HABITAT II CONFERENCE

1.4 From the outset, the preparatory process of Habitat II has been envisaged as a capacity building exercise to strengthen the role and capacity of key actors and stakeholders in improving the living conditions and environments of men and women.

1.5 A major component of the preparatory process for Habitat II is the identification, documentation and dissemination of Best Practices. A Best Practice is an example of actions which could serve as useful models from which others could learn and adapt to their own situations. They are actions, initiatives or projects which have resulted in tangible and measurable improvements in the quality of life of people in a sustainable way. These actions may be initiated by NGOs/CBOs, local governments, central and state governments, research institutions or the private sector. The objective of identifying and disseminating Best Practices is to establish a resource base for capacity-building in human settlements development throughout and after the Habitat II preparatory process. It is expected that the Best Practices initiative will continue beyond Habitat II as a tool for capacity building and for promoting cooperation at various levels for the transfer of expertise, experience and know-how. Efforts have been made to make use of the identified Best Practices to develop National Capacity Building Strategies for Urban Environmental Management to be supplemented by training and management development materials for dissemination.

PROJECT OBJECTIVES

1.6 The objectives of the project are:

- To accumulate from and exchange with other national/international institutions and organisations involved in urban environmental management, the knowledge of best practices.
- To identify best practices of urban environmental management as a crucial element of overall urban management.
- To extend knowledge of the best practices in India and to disseminate the project results to the United Nations Conference on Human Settlements (Habitat II).

- To provide national and international network linkages for further dissemination and wider replication of project findings through capacity building efforts directed at the city level.
- To develop national capacity building strategies for improving the urban environment.

PROJECT PROCESS

Collaborative Research Project

1.7 This is a collaborative research project taken up by Human Settlement Management Institute (HSMI), New Delhi and Institute for Housing and Urban Development Studies (IHS), Rotterdam. The project spans a period of two years beginning in October, 1994.

Research Phase

The Inventory phase

1.8 In this phase, contacts were made with institutions, public and private organisations, NGOs and professionals specifically dealing with issues related to urban environmental management. The First Expert Group Meeting organised at Chandigarh during January 13-15, 1995 identified a number of research areas, out of which the Project Advisory Committee, constituted for the Project, selected ten best practices for further study and research. After a series of consultations and discussions, a Terms of Reference for each study was evolved for research to be taken up by ten leading research institutions.

Research Studies

1.9 The ten research studies were completed in a period of nine months beginning in April, 1995. Intensive consultations and discussions took place by HSMI with the research institutions prior to submission of Inception Reports followed by Interim Reports by them. A Mid-Term Review of the research studies was undertaken jointly by HSMI and IHS Team from August 30 to September 25, 1995. The Project Advisory Committee for the Project kept itself fully abreast with the outcome of the Interim Reports and provided necessary directions and guidance in achieving the objectives of the studies. The Draft Final Reports were presented by the research institutions before the Project Advisory Committee towards the end of November, 1995. The Draft Final Reports, having taken note of the observations of the Project Advisory Committee, were suitably modified and the final reports were submitted by the beginning of January, 1996.

1.10 Each research study consists of theme development based on primary and secondary data analysis, documentation and

review of selected best practices. Each study describes the best practice with its main characteristics and outlines the modalities for its implementation. The research has analysed the critical factors for scaling up and replication of the experiences with due regard to institutional capacity, partnerships between local government and NGOs/CBOs and other interest groups. Gender aspects have been highlighted in terms of involvement of women in the participatory process of planning and implementation, target groups and beneficiaries.

Broad-Based Documentation Phase

1.11 This task included preparation of a Compendium Study in two parts, one comprising an overview of institutions, programmes and policies in urban India and the other containing the following documentations:

- Institutional documentation
- Documentation on programmes related to urban environmental management
- Annotated bibliography of reports and studies on urban environmental management

Second Expert Group Meeting and National Forum

1.12 With a view to deliberate on the findings of the research studies and to develop the National Capacity Building Strategies for Urban Environmental Management, a concluding Second Expert Group Meeting was organised at Manesar from 28-30 January, 1996 followed by a National Forum on January 31, 1996.

1.13 The Second Expert Group meeting evolved a draft Outline of National Capacity Building Strategies, as an outcome of the research efforts, for presentation to the National Forum. The National Forum discussed the draft and made valuable contributions in modifying the draft and bringing the same to its finality as Outline of National Capacity Building Strategies for wider dissemination, as given in Part III of this document.

1.14 The participants to the National Forum comprised eminent persons, mayors and chairpersons of local authorities, representatives of central/state/local governments, professionals from academic and research institutions and representatives of non-governmental organisations and private organisations.

SCOPE OF THE DOCUMENT

1.15 This document analyses the problems and issues as related to the ten best practices, documented and studied by a group of research institutions, for formulating National Capacity Building Strategies for Urban Environmental Management.

The document thus presents background information relating to the case studies covered under the research project, apart from focussing the application of best practices in urban environmental management. The document analyses policy framework,

urban governance, laws and institutions, partnerships, ecological preservation, sustainable new town development, alternative technologies for solid waste services and sanitation and gender aspects of urban environmental management.

II. Ten Best Practices in Environmental Management

1. IDENTIFICATION OF URBAN ENVIRONMENTAL PROBLEMS AND ISSUES

1.1 Accelerated urbanisation in the developing countries coupled with growing industrialisation has created an ecological and economic imbalance of unprecedented magnitude that threatens to undermine the development process and outstrip the environmental resource capacity of many developing countries. By the year 2000, about half of the world's population will be urban and majority of the urban population will live in large cities. While large urban areas have become major contributors to the gross national product of developing countries, they also create substantial environmental imbalances. The growing concentration of people, commerce and industry generate even larger amounts of urban wastes. These wastes often exceed the capacity of environmentally safe management systems, including the capacity of cities to efficiently collect and dispose them, the capacity of authorities to control them, and the capacity of nature to assimilate them.

1.2 The immediate and most critical environmental problems are referred to as the "Brown Problems". These include lack of safe water supply, sanitation and drainage, inadequate solid and hazardous waste management, uncontrolled emissions from industries, automobiles and low grade domestic fuels, accidents linked to congestion and crowding, and the occupation and degradation of environmentally sensitive lands as well as the inter-relationships between these problems. Water and waste disposal issues have contributed in a major way to the deterioration in the state of urban environment. The sets of problems relating to brown problems is closely linked to the poverty-environment nexus. The urban poor are largely affected by brown environmental problems. Among the poor, those most vulnerable to environmental threats include women, children and aged.

Urbanisation Scene

1.3 Like several other developing countries, India is experiencing massive urbanisation. In the first four decades of this century, the proportion of urban population was less than 12 per cent. Since then, the level of urbanisation has steadily increased from 17.20 per cent in 1951 to 25.72 per cent in 1991. Much of the urban growth has actually taken place between 1961 and 1991 when the urban population increased from 79 million in 1961 to 217 million in 1991. The rate of growth of urban population during the decade 1981-91 was 36.19 per cent which was considerably lower than the decadal growth rate in

the two preceding decades. By the year 2001, urban population is expected to increase between 300-320 million persons, adding during the 1991-2001 decade approximately 83-103 million persons.

1.4 It is a matter of concern that while the urban population increased almost eight times between 1901 and 1991, the number of urban settlements more than doubled from 1,827 in 1901 to 4,689 in 1991 indicating that major growth of urban population has been confined to existing urban settlements, particularly larger ones. The geographical distribution of India's urban growth is uneven on account of a variety of factors such as agricultural development, industrialisation and economic and transport linkages. The States of Maharashtra, Uttar Pradesh, Tamil Nadu, West Bengal, Andhra Pradesh, Madhya Pradesh, Gujarat and Karnataka together account for nearly three-fourths of India's urban population. The high level of urbanisation in Delhi, Chandigarh and Pondicherry is due to their being 'city states'.

Metropolitianisation

1.5 A very striking feature of the size-class distribution of urban population in India is the dominant role being played by the metropolitan cities having a population of one million or more. In 1991 there were 23 metropolitan cities as against 12 in 1981. These 23 cities accounted for one-third (70.6 million) of the total urban population in India. The four super-metro cities of Bombay, Calcutta, Delhi and Madras together accommodated 37.22 million people. It is therefore, imperative that these 23 metropolitan cities, where urban environmental conditions are severely strained, should be the focus of a sustained country-wide effort to regulate sustainable urban growth.

Urban Economy

1.6 Studies have indicated that the contribution of primary sector to the Indian economy is steadily decreasing. In 1965, it was 45 per cent which declined to 30 per cent in 1989. The decline in the contribution of primary sector has not shown a corresponding reduction in the working force. During the same period, industry's contribution rose from 22 per cent to 29 per cent and that of the services sector from 34 per cent to 41 per cent. The contribution of income from urban areas in total income was estimated to be 47 per cent in 1980-81 when the population in urban areas was 23.3 per cent of total population. By the year 2001, it is expected to increase to 60 per cent.

1.7 During 1981-91, the growth of employment in urban areas has been significantly higher than the country as a whole - 38 per cent as against 26.1 per cent for the country. Organised sector manufacturing which had grown at 1.9 per cent between 1973-74 and 1987-88, absorbed only a small share of the increase in workforce, while construction, trade and services fared slightly better.

1.8 This growth trend and rapid urbanisation has resulted in serious stress on urban infrastructure. Brown Agenda is gradually becoming more and more important with emphasis being laid on sustainability and depletion of natural resources.

Water Supply and Sanitation

1.9 Water resource depletion has become a serious issue when cities are forced to tap water from increasingly long distances. The country's seas, rivers and coastal areas are becoming more and more polluted due to alarming discharge of industrial waste, particularly mercury, lead and sewage. The Ganga at Kanpur, the Yamuna at Delhi and the Gomti at Lucknow have become highly polluted.

1.10 Water supply planning has now to be taken up on a regional basis taking into account the economic and environmental costs of using surface as well as ground water resources, the scope for conjunctive use, the possibilities for rain water harvesting and recycling and measures for promoting conservation of water. Given the limits to the drawal of water, reservation of areas for drainage and ground water recharge have to become essential parts of the urban planning process.

1.11 Recycling and reuse of water is another aspect of environmentally appropriate water management but it depends very much on pricing. It is noted, in many cities in India, as for instance the towns along the Ganga, the price for abstraction of water from the river is so low that there is no incentive for the re-use or recycling of water. On the other hand, in cities like Madras or Goa where water is just not available, fertiliser factories are using treated sewage in the former and recycled water in the latter. In Bombay, the pricing of treated water is high enough for some factories to recycle water. With regard to management of water quality, there is critical need for equipping municipal governments to monitor water quality at source and to publicise such information so that there is control by way of public awareness.

1.12 On sanitation, it is noted that present approaches and pattern of investments continued to accord less priority to the subject as compared to water supply. Every increase in water supply brings a new equal increase in waste water and therefore the issues need to be considered together.

1.13 The high cost of conventional sewerage and treatment systems have kept most cities from installing them. Out of a total of 4689 towns and cities only 453 are seweraged and that too partially. Low cost sanitation has now come up as an alternative and so far 853 cities and towns have been covered.

Initiatives in anaerobic treatment processes as well as improved approaches in oxidation, pisciculture, aquaculture and sewage farms in waste water treatment are being pursued more widely and consistently.

Solid Waste Management

1.14 It is recognised that the main problem pertaining to solid waste is that of management. Hazardous and toxic wastes from numerous small industries, hospitals, etc., are mixed with municipal wastes. Indiscriminate dumping is another factor. The handling, transport, treatment and disposal of solid waste has thus become more complicated. According to an estimate, India produces 75 million tonnes of waste every day in urban areas alone of which 50 to 70 per cent is collected. Since 1987, Bangalore has no official dumping sites for its 2000 tonnes of garbage generated every day. Delhi alone produces 4,000 tonnes of solid waste per day, 90 per cent of the waste collected is dumped in landfills at present.

1.15 Some cities have been successful in involving the private sector, voluntary organisations and resident associations in collection and neighbourhood disposal of solid waste. Activities of ragpickers have been integrated into the collection processes although they continue to work outside the system. The possibility of producing organic fertilisers through micro organisms, energy recovery from solid waste through pelletisation or methane extraction from sanitary landfill needs to be encouraged.

Transport

1.16 Transport congestion and pollution from vehicles have emerged as strong manifestation of deteriorating urban environment in the country. In sharp contrast to traditional Indian cities planned on high density and pedestrian scale, colonial and even post-independence cities, whether Delhi or Chandigarh, Bhubaneshwar or Bokaro, Durgapur or Singrauli, have long travel distances. The total number of motor vehicles in the National Capital, Delhi increased by 13.80 lakh over a 10-year period from 5,92,584 in 1982 to 19,72,998 in 1992. A large proportion of this increase was accounted for by two-wheelers which increased to 13.17 lakhs from 3.87 lakh during the same period.

1.17 The variety and number of agencies dealing with urban transport is an aggravating fact of life. The formulation of fuel efficiency and emission standards for transport vehicles involves the Ministries of Environment, Industry and Transport at the Centre; sulphur and lead content in fuel are determined by the Ministry of Petroleum; public transport is regulated by the States, while road use and traffic management are usually the concern of local authorities and police. City-based strategies are long overdue for Indian cities, particularly, metropolitan areas, with high motorisation factors.

1.18 The need of the day is a multi-pronged strategy of promoting non-motorised traffic, developing models of battery

run buses, decreasing work-related trips by decentralising activities on the pattern of National Capital Region Plan.

Energy

1.19 Energy has strong, though not fully understood, implications for urban environment. Energy consumption in industry, demand management and the use of pricing policies for promoting energy conservation are now receiving increasing attention. However, in comparison, energy intensity in construction and buildings, and more importantly household energy have not been addressed.

1.20 Household energy poses another major problem. Low income households which account for a third of the population in most Indian cities continue to depend on biomass for cooking fuel. Cities like Bangalore and Hyderabad have to import fuelwood from considerable distances. In the absence of demand management and any serious effort towards supply enhancement, urban low income households bear an inequitable burden by having to spend more on less efficient fuels.

1.21 There is a need for promoting urban forestry to improve availability of fuelwood and for introducing improved cooking stoves to minimize the hazards of indoor air pollution. It is also necessary to explore alternatives to biomass, which may have significant potential, through technology options such as pelletisation, coal gasification, production of gas from sanitary landfills and biogas from city wastes. Studies should be undertaken to document the economics, advantages and appropriateness of such alternatives.

Urban Planning

1.22 Urban Planning has a direct relationship with urban environmental management. Physical sense of placing the activities according to the linkages between them could to a great deal contribute in energy efficient and resource conserved planning. Besides just land use planning and orientation of activities and buildings, there is a need to create an environment which promotes agencies to work coherently, makes people think in terms of conservation and gives industries incentives to improve working and living conditions. This calls for significant upgradation of skills in the development authorities and local bodies so that they can take into account all these issues while preparing Development Plans. There is also a need to involve NGOs and the public at large in the planning process.

Industry

1.23 Industries are said to contribute significantly in causing air, water and land pollution and at the same time their importance in generation of employment and income cannot be denied. Thus the question is how to improve production process, recover resources from waste, categorise and locate them appropriately so that city environment is not damaged.

1.24 According to a study of registered factories in Delhi, there are at present 46,000 industrial units in Delhi, 77 per cent of which have less than 10 workers and 16 per cent between 10 and 20. The second Master Plan 1981-2001 for Delhi estimates that the number of industrial units in Delhi by 2001 will increase to about 93,000. As per the action plan prepared in 1991 for alleviating pollution in Delhi, the statistics indicate that there were 45 major polluting industries in addition to 28 industrial estates/clusters. The amount of different pollutants emitted from these industrial areas varies depending upon the industrial processes and types of fuels used.

1.25 In the context of policies for economic liberalisation and delicensing of industries, environmental guidelines have become critically important for guiding the location of industries. Zoning or grouping of industries with similar processes will need to be strengthened by the enforcement of environmental laws and coordination among Pollution Control Boards, local bodies and other concerned agencies. This entails that local bodies will have to build their capacity and information base in order to be able to play a more dynamic role in future.

Institutional Mechanism and Legal Framework

1.26 Government policy is stated in the form of Statements on Forestry, Abatement of Pollution, National Conservation Strategy and Policy Statement on Environment and Development. To implement these policies, several statutes have been enacted.

1.27 The Air (Prevention and Control of Pollution) Act 1981, empowers states to prescribe emission standards for industry and automobiles in consultation with the Central Board. Under this Act, all industries operating within designated air pollution control areas shall have to obtain a permit or consent from respective State Boards. The Water (Prevention and Control of Pollution) Act, 1974 provides for the constitution of a Central Board for prevention and control of water pollution and of restoring the wholesomeness of water quality. The Water (Prevention and Control of Pollution) Cess Act of 1977 passed subsequently envisages incentives for adopting pollution control and authorises government to impose tax for water consumption. The Wildlife (Protection) Act, 1972 was amended in 1991 to Wild Life (Protection) Act to regulate hunting of wild animals and birds, develop sanctuaries and national parks and regulate trade in wild animals and animal products. The National Forest Policy, 1988 emphasises the need to restore ecological balance and conserve the country's natural forest. The Environment (Protection) Act, 1986 sets out the parameters under which the Ministry operates to formulate and carry out environment policy at the national level.

1.28 The National Conservation Strategy and Policy Statement on Environment and Development, adopted in June 1992, provides the basis for the integration and internalisation of environmental considerations in the policies and programmes of different sectors. It also emphasises sustainable life-styles

and proper management and conservation of resources. The Factories Act, 1948 requires all factories to make effective arrangements for waste disposal. In 1987, a new chapter on regulating hazardous industrial processes was introduced in this Act. Certain States also passed River Board Act, 1956 to combat the problem of pollution of their river resources. Central Motor Vehicle Rules, 1989 compels the manufacturer of vehicles to upgrade technology to meet the desired emission standards. Public Liability Insurance Act, 1991 makes it mandatory to cover insurance for public which may be effected by use and transport of all hazardous chemical products. In addition, a large number of environmental laws and acts are in existence with the main objective being to prevent environmental pollution.

1.29 These Acts and Laws are enforced by a large number of agencies operating at the central, state and local levels. The Department of Environment and Forests established in 1980 and formed into the Ministry in 1985, has wide ranging responsibilities as the apex body within the government responsible for the subject on environment, forests and wildlife. Subsequently, Central Pollution Control Board setup primarily for problems relating to water pollution, gradually enlarged its scope of work to evolve industry-specific Minimum National Standards (MINAS) in 1977-78. These standards have been notified by the Central Government under Environment (Protection) Act, 1986. Although the role of Pollution Control Board is more of an advisory nature, it also provides technical know-how in various industrial and related activities. Directorates of Industries and Transport, State-level Water Supply and Drainage Agencies, Town Planning Agencies and Housing Boards, etc. also play a significant role in this regard.

1.30 While State Pollution Control Boards will continue to play a major role in abating pollution, there is a need to emphasise better coordination and information sharing amongst the municipal governments and development authorities. The present practice of making environmental and impact assessment on individual industry basis, needs to broaden its scope for calculating its impact on regional basis to ensure that the total impact of an industrial area on a particular region is not missed out. This calls for improving the information base and monitoring systems so that the pollution loads can be satisfactorily calculated and penalties may be suitably applied.

Some Broader Issues:

1.31 The broader issues identified in the course of discussion are:

1. Local Institutions and agencies to coherently deal with the subject of local environmental management over and above their present responsibilities.

2. Participation of other actors such as private entrepreneurs and communities is a prerequisite for successful implementation of an environment abatement package.
3. Feasibility of New Instruments that is, Build, Own, Operate (BOO), Build, Own, Transfer (BOT) needs to be worked out for involving private sector.
4. Conservation and scientifically updating traditional and popular practices should be emphasised.
5. Decentralising the governance and bringing local institutions to the fore will help achieve better coordination and management.
6. Cost effective technical interventions need more community awareness and planning. NGOs could probably help in bridging the gap between community and government.
7. Planning and accounting for availability of natural resources should be done to avoid their wasteful consumption.
8. Conservation of natural resources cannot be achieved by setting of standards or through enforcing laws. Fiscal instruments needs to be devised to prevent waste of resources through a system of economic incentives and disincentives.
9. Information base will have to be strengthened and it should be accessible to all concerned with the issue.
10. Capacity building for urban environmental management should not be viewed as limited to municipal institutions alone. Being a cross-sectoral issue, all professionals, citizen groups and NGOs should develop constituency to interact, consult and build consensus as part of pre-requisite for institutional building.
11. Planning for specific activities and specific purposes is a tool which could be very handy in dealing with pollution abatement. This should be given due importance in the environmental management exercise.
12. One of the most important aspects of managing urban environment is upgrading human skills. It is therefore essential to assess the training needs and impart specialised skills in fields pertaining to environmental management and impact assessment.

2. THEMATIC CATEGORISATION AND SELECTION OF TEN BEST PRACTICES

2.1 The various issues taken up for discussion in the First Expert Group Meeting held at Chandigarh during January 13-15, 1995 consisted of urban infrastructure management, concepts and practices in planning techniques, preservation and conservation of natural resources, improving the work and living environment within and outside industrial premises, reducing city pollution through fiscal instruments and the like. In order to facilitate the discussion and to help finalise the specific topics for research and further documentation, various issues are categorised in the following broad themes:

The institutional, legal and regulatory framework for environmental management at the local level and the role of the Pollution Control Board and other monitoring agencies therein

2.2 This theme looks into the responsibilities for environmental management at the local municipal level and addresses the questions of responsibility, authority and accountability. It relates as well to the question how to involve the public in environmental management aspects.

2.3 Cases may relate to experiences in the context of the implementation of the 74th Constitution Amendment and the integration of environmental considerations in the legal provisions at State level.

City-Wide Planning Experiences with Improving Urban Environmental Conditions

2.4 This theme provides an overall framework for the research outcome and relates to present practices and experiences with improving urban environmental conditions.

- Possible cases are Bombay Metropolitan Environmental Improvement Programme (MEIP), Calcutta Environmental Improvement Programme (EIP), Madras Sustainable Cities Programme (SCP), Chandigarh, Baroda and Kanpur
- National Programmes: Urban Poverty Alleviation, Urban Basic Services for the Poor, Environmental Improvement of Urban Slums and Integrated Development of Small and Medium Towns.

Partnership Development in Environmental Management

2.5 Partnership development forms an interesting entry point for city-wide development processes and addresses the constraints that each local authority is faced with. All major urban environmental programmes utilise partnership development as a central development concept. It is assumed that partnership

building not only opens up new avenues of resource mobilisation but also attributes responsibilities to the partners involved so that they make their own individual contribution.

2.6 At the same time it is realised that actual experience with partnership development are limited. Case development may contribute to a better understanding of the issues involved and contributing to capacity building at the municipal level.

2.7 Possible cases are the experiences with networking of slums in city development (Indore); public-private partnership in provision of services (Rajkot and New Bombay); and involvement of NGOs, community groups and citizen's fora in city level decision-making processes (SPARC, Bombay; Civic, Bangalore).

Pollution Aspects of Small-Scale Industries

2.8 This theme may focus on the relationship between pollution aspects of small-scale industries, employment aspects and environmental protection measures. It brings in the experiences of the Central Pollution Control Board, State Pollution Control Boards, the National Productivity Council, Directorate of Factories, Directorate of Industries, Labour Unions and other agencies dealing with this important issue.

2.9 Tanneries in Kanpur, selective experiences of the Central Pollution Control Board (CPCB) and relocation efforts taken for tanneries in Calcutta would fall in this category. Other interesting experiences relate to foundries in Agra, glass industries in Firozabad, brassware in Moradabad and Mirzapur, lock industry in Aligarh, scissor industry in Meerut, and so on.

Solid Waste Management

2.10 The issue of solid waste management has received growing attention of late for obvious reasons. By taking up this issue an important contribution can be made to the discussion as to how to improve the situation.

2.11 Analysis of this issue includes the documentation of selected experiences and the question of growing to scale of successful but isolated and small cases. It relates as well to the earlier theme of small-scale industries wherein pollution aspects of recycling processes are addressed. Environmental impact analysis includes the segregation and handling of hazardous waste as well.

2.12 Cases are Wastewise, Centre for Environmental Education (CEE), Exnora, Excel Industries, Shivashankar Industry, Bhawalkar Earthwork Research Centre and so on.

River Basin Development and Management

2.13 This aspect relates to an analysis of the experiences with the Ganga Action Plan (GAP) and serves to develop guidelines

LOCATION OF STUDY TOWNS



for similar programmes such as the Gomti Action Plan and the Yamuna Action Plan.

2.14 Experiences from selected cities in the Ganga basin need to be reviewed in terms of institutional responsibilities, impact of different schemes on environmental quality, critical success factors, etc. A case study on development in Eastern Calcutta (land-use, conservation of green areas/wetlands, relocation of industries, NGO involvement role of labour unions, etc.) could sharpen the focus.

Carrying Capacity based Regional Planning

2.15 Planning for designed population has been a conventional approach of city planners but constraints of availability of resources and the capacity of natural sink to absorb the wastes has resulted in new thinking. Carrying capacity based planning takes into account the capacity of the region in terms of deciding the population it can sustain. Cases are National Capital Region (NCR) and Doon Valley.

Financial Management of Urban Environmental Improvements

2.16 Improved financial resources management at the municipal level forms one of the main aspects of better environmental management. Revenue realisation, improved cost-recovery options and tariff adjustment are the concepts which are widely applied today.

2.17 Selected city experiences with improved financial management can provide case study materials. Possibilities are Gadag, Karwar, Nipani and Udipi in Karnataka, and Visakhapatnam and Hyderabad in Andhra Pradesh. The aim is to determine the critical factors for success. Is it a matter of leadership alone that plays a vital role in improving economic performance of the city? How realistic are the concepts in relation to affordability aspects that could to be documented under this theme?

2.18 The discussions during the first Expert Group Meeting finally built a consensus for taking up the following three broad themes. Research studies under each theme were also identified for which the terms of reference were worked out.

(1) Democratic Decentralisation, Preparation of Local Agenda 21 and Public Involvement

The process of empowering local governments to take up the challenge of preparing Local Agenda for environmental management was the main idea of this theme. Three studies were selected in this theme to cover the aspects mentioned above. One study was to demonstrate the process of political and functional decentralisation of urban governance pertaining to 74th Constitution Amendment Act (CAA). Other studies mainly documented the tools available for preparation of Local

Agenda 21 and the role of NGOs/CBOs in the decision making process. The studies selected are:

- a) Power to the People: The Local Government Context
- b) Carrying Capacity Based Regional Planning
- c) NGO/Civic Societies and Urban Environmental Advocacy

(2) Environmental Sanitation and Improvement of Living and Work Environment

This theme looks at environmental problems within the working and living environment. Innovations in sanitation, solid waste management and small scale industries, mainly tanneries and electroplating industries, have been covered under this theme. The focus of this theme has been on the simple and easy to operate practices that each of these industries may adopt by improving work environment and also reducing pollution. The studies undertaken for this theme are:

- a) Integrated Low Cost Sanitation: Indian Experiences
- b) City-wide Best Practices in Solid Waste Management in Collection, Transportation and Disposal
- c) Environmental and Health Improvement in Jajamu Area, Kanpur: Lessons and Experiences for Wider Replication
- d) An Approach to Pollution Prevention in Electroplating Sector

(3) Eco-Preservation, Sustainable New Town Development and Community Based Environmental Improvement of Cities

This theme discusses the importance of community based planning and how new agencies can take up the task of sustainable development, by guiding new town development; examples of Calcutta and Indore were found interesting because in the former traditional practices have prevailed for years while in the latter planning interventions have been used for improving the city with focus on slums and community developmental aspects. The case of CIDCO has strengthened the fact that appropriate strategic framework or development course can use local environmental management skillfully and successfully. The studies taken up under this theme are:

- a) Integrated Study on Wetlands Conservation and Urban Growth: A Case of Calcutta's Wetlands
- b) Sustainable Urban Development: A Case of Navi Mumbai (New Bombay)
- c) Community Based Sanitation and Environmental Improvement Programme: Experiences of Indore, Baroda and Ahmedabad.

3. MAIN ASPECTS OF THE BEST PRACTICES

3.1 Ten best practices selected under this project for documentation and research have been analysed in this section in terms of their background and main aspects exhibited by each of them as follows:

POWER TO THE PEOPLE: THE LOCAL GOVERNMENT CONTEXT

Background

3.2 According to the 1991 Census, there were 3,592 urban local bodies in India of which 55 were Municipal Corporations and 1,290 were designated as Municipalities. Another 253 were governed by Municipal Boards and 213 were listed as Municipal Committees. In addition, there were several other types of local bodies such as City Municipal Committees, Town Municipal Committees, Town Panchayats, Notified Area Committees and Cantonment Boards.

3.3 The Constitution of India, which came into force in 1950, has made detailed provisions for ensuring democratic functioning of Parliament and the State Legislatures. The Directive Principles of State Policy refer to village panchayats, but there is no specific reference to Municipalities, as the third tier of urban local government. Consequently owing to inadequate constitutional provisions for urban local governments, democracy at this level has not been stable. Though the Municipal Acts of respective States do provide for regular elections to municipal bodies at regular intervals, they have been frequently superseded for decades and in some cases for indefinite periods of time. Frequent and indefinite supersession erode the very basis of local self-government and have a deleterious effect on the functioning of democracy at the grassroots level.

3.4 In relation to municipal elections, the provisions in different States are not uniform. In some States, arrangements for election are made by the State Government, while in others Municipal Commissioners make direct arrangements.

This study demonstrates the potential of the Constitution (Seventy-fourth Amendment) Act, 1992, for spreading local democracy in India, ensuring local fiscal autonomy and for giving a new dimension to the functional domain of the Municipalities so that besides performing the conventional municipal functions, the urban local governments in India may assume new responsibilities for urban environmental management all with a gender - sensitive approach.

Salient Features

3.5 The reforms package in India aims at influencing the existing arrangements for local self-government in five critical areas, namely:

- (1) The Political Context - Strengthening Local Democracy

Specification of the territorial jurisdictions of Municipalities based on newly defined criteria for municipalisation, and in cities with population of 300,000 or more, constitution of Ward Committees involving people's representatives, installation of representative

local governments at the helm of civic affairs, reservation of seats for women besides other identified groups from among the weaker sections, regularity of elections, limited control by State Governments and specified powers for dissolution, are among the salient features of the Constitution Amendment Act, 1992 in so far as political decentralisation is concerned.

- (2) The functional domain of local governments

Unlike the functional jurisdictions of the States which follow a Constitutional delimitation, the functional domain of local bodies in India, including municipal governments, is derived from the responsibilities which are delegated by the States to the Municipalities, through legislation. While allowing the State Governments to determine the functional domain of the municipalities from a list of 18 suggested functions (Twelfth Schedule), the Constitution breaks new ground by suggesting that besides performance of the conventional municipal functions, local governments may also be made responsible for preparation and implementation of plans for economic development and social justice.

TWELFTH SCHEDULE (143 W)	
1.	Urban planning and 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 environment and promotion of ecological aspects.
9.	Safeguarding the interests of the weaker sections of the 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 and playgrounds.
13.	Promotion of cultural, educational and aesthetic aspects.
14.	Burials and burial grounds; cremations, crematoriums 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.

(3) The fiscal arrangements

Each State would set up a State Finance Commission, common both to rural and urban local bodies, to make recommendations on the principles which may govern the assignment and sharing of taxes, tolls and duties as also for grants-in-aid. These Commissions would, thus, ensure that the State- Municipalities fiscal inter-relationships would be based on principles and not on political considerations.

(4) A new framework for urban planning

The new emphasis is on preparation of development plans, at the district and metropolitan levels, as against the conventional land use plans and integration of plans for rural and urban areas. The Constitutional provisions also require that peoples representatives should have a say in planning matters.

(5) A new role for local government in urban environmental management

New emphasis on urban environmental management has been made in the Constitutional provisions. This would ensure linkages among infrastructure, productivity, poverty and environmental health.

CARRYING CAPACITY BASED REGIONAL PLANNING**Background**

3.6 Carrying capacity based approach to planning is both a concept and a tool towards sustainable development of human settlements. The very concept of 'carrying capacity based planning' is new in India, not to speak of the availability of tools and techniques to operationalise the concept at the level of urban and regional planning.

3.7 The notion of 'Carrying Capacity' refers intrinsically to the finite capacity or the limitation of the natural environment both as a reservoir of resources to support human consumption and as a sink to assimilate the residuals or wastes. Thus carrying capacity based planning needs to deal with the management of the 'throughput', that is, the size and nature of human activities leading to resource consumption and waste generation, as well as the supportive resource base and the assimilative capacities of the environment. In other words, the planning approach may require optimisation of human demands in relation to manageable supply of environmental resources. Carrying capacity based urban planning aims towards management of the demands for various regional and local environmental re-

sources required to sustain the desired economic activities and quality of life across urban areas and the supply of such environmental resources within their regenerative capacities.

3.8 The study aims to define the concept of carrying capacity based urban and regional planning and then develop a methodology to operationalise such a planning approach. Furthermore, the study indicates the institutional restructuring to be incorporated into planning practices for preparation of Agenda-21 and capacity building at the local level.

Sallent Features

3.9 The broad dimensions of carrying capacities of urban areas may be categorised into:

- Waste Assimilative Capacities
- Carrying Capacities in respect of Environmental Resources and Infrastructure.
- Limited resource constraints

3.10 Different modules of carrying capacity indicators have been developed in this study to estimate capacities in respect of the various identified urban environmental resources alongwith their respective parameters and procedures for measurement. They are grouped as follows:

- waste assimilative capacity indicators for air, water, land/soil, biological and acoustic environmental components of the urban area.
- supportive capacity indicators for land, housing and various social amenity resources of the urban area.
- supportive capacity indicators for transportation infrastructure facilitating regional and internal accessibilities and communication infrastructure for the urban area.
- supportive capacity indicators of urban utilities, namely, water supply, sanitation and energy supply for the urban area.
- socio-economic capacity indicators of manpower resources, economic base and local institutional resources of the urban area.

NGOS/CIVIC SOCIETIES AND URBAN ENVIRONMENTAL ADVOCACY

Background

3.11 Advocacy in the context of urban environment is emerging as a focus for activists, social scientists and development practitioners. The individual efforts of highlighting urban issues have gradually started taking more organised and institutionalised shape in the form of NGOs. Strengthening the civic society for effective advocacy therefore, becomes more pertinent and is the need of the hour.

3.12 With rapid urbanisation and industrialisation, the condition of urban environment is deteriorating every day affecting the quality of life of the people living in those areas. Moreover, the infrastructure of the civic amenities is also collapsing due to lack of resources and institutional constraints coupled with insufficient capacity of the local bodies. Thus, advocacy in urban environmental context becomes an inevitable instrument to encounter problems and constraints in building a sustainable and liveable urban environment.

3.13 Significant contributions have been made by NGOs in urban environmental advocacy process, study of which can provide modalities for replication and directions for initiating capacity building process for NGOs.

Sallent Features

3.14 The focus of advocacy in India has remained on issues primarily important in rural context. The issues pertinent in urban context are gradually being raised by a cross section of civic societies. However, the advocacy efforts to highlight such issues are still in their nascent stage. The majority of experiences which have used some degree of advocacy revolve around solid waste management, environmental pollution, forest/green cover degradation in cities and human settlement issues. People's groups and citizen's councils are becoming more organised to identify issues of concern and build strategy for advocating such issues at various levels of power centre. The efforts mainly concentrate on building organised efforts around institutions, NGOs and structured secretariat for advocacy.

3.15 The three case studies documented here are on urban environmental advocacy processes. The first case study is about the 'Swachh Ganga Abhiyan' or 'Clean Ganga Campaign' in the holy city of Varanasi. Varanasi is an old religious centre of the Hindus where a large number of people come everyday to take bath in the holy river Ganga. The sewerage system of the city could not cope with the expansion of the city boundaries and population. As a result, the pollution level in the river near Varanasi has become alarmingly high. The Sankat Mochan Foundation, under the leadership of a few scientists and Science and Engineering Faculty of Banaras Hindu University (BHU), highlighted the issues upto the highest centre of power and introduction of Ganga Action Plan (GAP) is considered to be

significantly influenced by the efforts of this Foundation. The Foundation is still active in ensuring that the second phase of the GAP is properly planned and implemented.

3.16 The second case study deals with the advocacy process undertaken around the deteriorating condition of Shahpura Lake in Bhopal. Bhopal is city of lakes and these lakes have a major impact on the environment of the city. After the 'Mass Fish Kills' in the lake due to high BOD level, the citizens of Bhopal along with the Bhopal unit of Youth Hostel Association of India (YHA), National Centre for Human Settlement and Environment (NCHSE) and Society for Environmental Conservation (SEC) initiated a process of protest and demonstration by starting cleaning the lake by their own efforts. This action questioned the accountability of the Bhopal Municipal Authority to the people in keeping the city environment clean. The concerned departments and state level bureaucracy constituted a co-ordination committee. The lake has now been improved due to efforts and active involvement of the Government, NGOs and people in the process.

3.17 The third case study is related to one of the finest wetlands in Calcutta as an indigenous system of waste recycling. Gradually, the wetlands are shrinking in size and the government and private contractors are taking away parts of wetlands for construction of housing colonies and industrial complexes. This process has been intervened by PUBLIC (People United for Better Living in Calcutta) by filing a public interest litigation case with the High Court and the court has provided a permanent stay prohibiting any further construction on the wetlands. Within the issue of wetlands, a co-operative society of the fishermen's known as 'Mudialy Fishermen's Co-operative Society' (MFCS) has been formed where various interesting experiments of waste recycling and improving the yield from pisciculture have been attempted. The society operates on leased land of the Calcutta Port Trust (CPT) and CPT wants to take back their land. The protection of wetlands and this unique experiment of recycling of waste and pisciculture in that waste which provides livelihood to more than 250 fishermen becomes very important. The advocacy is being taken up by the MFCS and a forum of NGOs.

INTEGRATED LOW COST SANITATION : INDIAN EXPERIENCES

Background

3.18 Open defecation and use of bucket latrines is widely prevalent in both rural and urban areas of India. This in turn has led to the demeaning practice of manual scavenging of human excreta by humans which stigmatized a particular section of the society and bred the social practice of "untouchability". Apart from being a degrading menial practice, manual scavenging also posed many health hazards.

3.19 The study highlights important examples of urban environment management experiences of 'best practices' followed

by the Sulabh International Social Service Organisation (SISSO) and other NGOs/voluntary organisations at micro levels, with people's participation, in implementation of integrated low cost sanitation-cum-scavengers liberation programme in different geo-physical and socio-economic conditions.

3.20 The study aims to highlight the following aspects of the strategies pertaining to implementation of low cost sanitation technology:

- Socio-economic, techno-economic and socio-cultural aspects of beneficiaries.
- The potential for applicability of this technology to different situations and its replicability.
- Role of voluntary organisations (NGOs) for programme implementation.
- People's participation.
- The role of government and local bodies as provider or facilitator.

Salient Features

3.21 The technology developed by SISSO is of twin-pit pour-flush toilet that uses lesser amount of water for flushing. The excreta falls to a leach pit which absorbs water content and leaves the waste dry so that it may later be used as manure. Gas and liquid is slowly absorbed by the soil through uniform holes along the wall of the pit, and the waste is rendered odourless. The main advantages of this technology above other sanitation technologies are:

1. It is a permanent installation which is economical and durable. It can be afforded even by the weaker sections of the society.
2. It is odourless with no air pollution, as the water-seal prevents gases from leaking out of the pit through the pan.
3. Only a small quantity of water (about 2 liters) is enough to flush the excreta, while conventional flush latrine uses 14 litres of water for flushing.
4. It requires less space and can be constructed even in the courtyard, corridor, veranda or in the living room of a house, as it is free from foul smell and there is no mosquito, fly or insect nuisance. It can be constructed in cross socio-cultural and economic set-up where water is used for ablution, and in varied physical, geological and hydrogeological conditions with proper precautions. The technique of construction is simple and it can be constructed by ordinary trained masons using local labour and materials.

5. It can be constructed on the upper floors of the buildings also.
6. As the pits are covered with air and water tight RCC slabs, the place can be utilised for other purposes too.
7. It is free from all health hazards and does not pollute surface or ground water if proper precautions are taken at the time of construction.
8. The maintenance is easy, simple and costs little.
9. Services of a scavenger are not needed to clean the pit as the sludge of the pit is safe for handling after two years of rest period.
10. Organic manure and soil conditioner of good quality becomes available to the householders for use in the field or garden.
11. The toilets can be connected easily to sewers.

CITY-WIDE BEST PRACTICES IN SOLID WASTE MANAGEMENT IN COLLECTION, TRANSPORTATION AND DISPOSAL

Background

3.22 Solid Waste Management (SWM) involves managing activities associated with generation, storage, collection, transfer and transport, processing and disposal of solid wastes in an environmentally safe manner, adopting principles of economics, aesthetics, energy and conservation. The study assimilates isolated but promising small scale solid waste management practices, looking into their integration and effectiveness in the city waste management process. Identification of the key practices that can be implemented in other cities will help in designing a programme for replicability and scaling up of the practices.

3.23 This study documents innovative practices in solid waste management components like collection, transportation, disposal and recycling. The study looks into innovations tried successfully in the cities of Ahmedabad, Bangalore, Bombay, Madras, Pune and Rajkot. The stress would be to look into the role of the community in the effective utilisation and sustainability of the system.

Salient Features

3.24 The main aspects of this practice are as follows:

- i) Door to door collection and public awareness

This practice operates at a small scale restricting itself to collection of waste and local transportation to the municipal collection points and provides solution to haphazard discarding of waste by residents compounded

by an irregular municipal collection system. This practice, the following purposes are solved; the waste gets cleared from the locality, the residents do not have to go out to dispose the waste, and the ragpickers get employment along with self respect.

- ii) Door to door collection and neighborhood disposal of waste

These practices are similar to the ones mentioned earlier with a difference that the organic waste collected is disposed in the same neighbourhood and composted while inorganic waste is brought to the municipal collection points to be transported to the landfill site or sold by collectors. The practice has made an impact in the form of clean environment for the residents through ragpickers trained in disposal techniques who manage the waste within a locality thus reducing the load on transporting the same to the landfill site and contributing to the recovery of materials.

- iii) Transportation of solid waste

Innovation in transporting the solid waste is primarily in the form of partnerships with private entrepreneurs besides the modifications and technical improvements in the designs of community bins and handcarts. Mechanised equipment such as like front-end loaders and compactors facilitate speedy transport of solid waste and require high capital investment on the other hand. Few municipalities namely Rajkot and Ahmedabad have been successful in contracting out the collection and transportation of solid waste to private agencies. This has proved to be very successful in reducing transportation costs.

- iv) Disposal of solid waste

Various scientific and result-oriented processes have been developed to dispose and recycle organic waste in a hygienic manner. A few of them are such as can be operated at a very small or household level. Very recently, the disposal of solid waste has been perceived as a profitable venture by a number of industries who are coming to the fore with varied processes such as mechanical bio-composting and conversion into fuel pellets.

- v) Resource utilisation, recovery and recycling

Waste is a major resource available in ample quantities, if utilised properly. It requires timely and appropriate treatment for recycling and further use. On the other hand, there is no dearth of human resource too. If these two resources are mixed and handled optimally, wealth can be created. But the catch word

in this type of resource recovery is segregation, which can only be achieved through public participation. A number of schemes have focused on segregation process by integrating waste pickers in the former system.

ENVIRONMENTAL AND HEALTH IMPROVEMENT IN JAJMAU AREA, KANPUR : LESSONS AND EXPERIENCES FOR WIDER REPLICATION

Background

3.25 Indo-Dutch Environmental and Sanitary Engineering Project (IDP) at Jajmau, Kanpur was taken up as part of Ganga Action Plan (GAP), the main objective being cleaning of the river water to certain acceptable level (bathing level). Emphasis of this project has been on integrated development of three interdependent elements, namely the river, the industries polluting the river and the low income community where most of the workers serving in the industrial units live.

3.26 The primary focus of this project has been:

- To intercept and treat the flow of sewage and other liquid wastes away from the Ganga.
- To establish feasibility of innovative technology application in the treatment of wastes and recovery of resources, energy recovery, aquaculture, etc.
- To monitor and suggest steps for reducing water pollution caused by the industrial units.
- To take other measures such as construction of electric crematoriums, bathing ghats and monitoring stations to keep the river clean.

Sallient Features

3.27 The important aspect of this project was the deviation from conventional engineering approach in other areas such as institutional development, interventions of human resources and community participation, each linked to the other. This strictly calls for close coordination, commitment and cooperation amongst all the participating institutions.

3.28 The interventions propagated in this project could be broadly divided into the following six heads:

- (1) Waste treatment from tanneries:

Besides the introduction of a new technology (UASB) for waste water treatment, chromium recovery from tannery waste and its recycling was promoted through technology inputs. Common industrial waste water conveyance system laid in this project for waste water

from tanneries assured fuller treatment of the effluent. Handling of solid waste and recovery of tannery by-products was promoted through innovative technologies.

(2) Occupational safety and health protection measures:

Tannery workers were trained in first-aid and safety measures to be followed in tanneries. A workshop conducted on occupational and environmental health improvements resulted in implementing the recommendations in some tanneries. Another positive aspect was the inclusion of occupational health as one of the main elements of industrial counselling.

(3) Slum area development:

Selected interventions through community based approaches resulted in improving the water supply, sanitary facilities and solid waste management. This in turn lead to reduction in the number of illegal water connections, helped in providing sanitary facilities to all slum dwellers and improved solid waste collection.

(4) Community participation:

Community participation was envisaged through direct and indirect approaches:

Direct approach: The community made a unit with intermediaries for participation in the schemes of water supply, low cost sanitation and solid waste management. This unit participated in the planning, implementation and O&M of project components, besides conveying the needs, perception and attitude of different categories of population for project formulation.

Indirect Approach: Instead of using direct communication, the community was reached via a network of trained change-agents such as Traditional Birth Attendants (TBA's), Private Medical Practitioners (PMP's), Primary School Teachers (PST's), Angan Wadi Workers (AWW's), Adult Education Teachers (AET's). This helped in gaining the confidence of the community and therefore better participation.

(5) Institutional development:

This consisted of strengthening of institutions involved in establishment of necessary infrastructure to carry out its tasks and training for improving the capabilities and skills of different levels of staff responsible for operation and maintenance of the schemes. Training was seen as a means of improving inter-relationship within municipal agencies and between the implementing agencies and the beneficiaries.

(6) Development of women:

Three different types of skill training of community women folk as plumbers, masons and fabricators of fibre reinforced plastic (FRP) products were conducted. The results were fairly encouraging as the end-products were of not only good quality but women plumbers also improved water supply through rehabilitation works and legalising of connections.

AN APPROACH TO POLLUTION PREVENTION IN ELECTROPLATING SECTOR

Background

3.29 The gradual deterioration in the urban environmental quality is largely attributed to the increasing number of hazardous industrial operations. This study mainly refers to the electroplating sector. Small scale electroplating units when present in a cluster cause severe damage to the urban environment. Environmental problems from this sector include ground water, soil pollution and bio-accumulation of heavy metals.

3.30 The research study mainly looks at the pollution prevention initiatives taken in the electroplating sector that have an impact on urban environmental quality. The growth of electroplating sector has direct correlation with rapid industrialisation process. The growth of this sector is mostly urban oriented and it operates as an ancillary to big units. It is estimated that there are about 3000 electroplating units both authorised and unauthorised operating in the eight industrial estates of Delhi. In Delhi, besides causing local land and environmental problems, a significant part of pollution load of the river Yamuna is contributed by municipal as well as industrial wastes.

Sallient Features

3.31 The main focus of the study was to identify and document opportunities and best practices in pollution prevention in nickel-chrome and zinc electroplating industries located in Anand Parbat, Naraina and Mayapuri industrial areas of Delhi. Insights have been drawn from the positive examples from Madras and Parwanoo (Himachal Pradesh), in formulating recommendations and strategies for wider acceptability for pollution prevention initiatives in electroplating sector.

3.32 This study mainly analysed:

- Current practices followed in electroplating units of Delhi, Madras and Parwanoo, especially in nickel-chrome and Zinc plating units.
- Scope for implementing pollution prevention techniques
- Constraints and potentials associated in adaptation by large number of entrepreneurs.

General understanding on best practices for preventing pollution was obtained through secondary literature survey. Based on the pollution prevention feasibility studies conducted earlier, the scope for improvement has been assessed.

INTEGRATED STUDY ON WETLAND CONSERVATION AND URBAN GROWTH: A CASE OF CALCUTTA'S WETLANDS

Background

3.33 The East Calcutta Wetlands are peri-urban wetlands near the metropolis of Calcutta. The functional use of the East Calcutta wetlands has developed it into a unique man-made eco-system. The area has been identified with waste recycling practices. The waste recycling practices not only provide fish, vegetables and crop production throughout the year but also support low cost system for urban sanitation and spill basin to reduce water-logging of the congested metropolis of Calcutta.

3.34 The research was carried out with a view:

- To enhance basic understanding and better perception for policy formulation and project implementation and hence the productive use of wetlands.
- To study involvement of NGOs not only for appropriate traditional use but also for mutually - beneficial watchful protection of wetlands.
- To study the opportunities and avenues for income and employment augmentation of the people dependant on wetlands.
- To achieve in the process, sustainable utilisation of wetlands throughout the city so that these may yield the greatest continuous benefit to the present generation while maintaining their potential to meet the needs and aspirations of future generations.

Sallient Features

3.35 The integrated wetland system of East Calcutta is one of the examples in environmental protection and development management where benefits are achieved at a much lower cost and in harmony with the environment. The wetlands of Calcutta effectively address the three major challenges of (1) treating waste, (2) employment-generation and (3) food production and thus can be qualified as a win-win option.

3.36 East Calcutta Wetlands area alongwith its ecological system as well as all existing best practices is unique in the sense of recycling of garbage and city sewage in an indigenous, age-old method. Utilising sewage, this is a well-managed sewage-fed fisheries system at Mudiali at south Calcutta on the fringe of river Hoogly in Calcutta Port Trust Area.

3.37 Sewage-fed fisheries or aquaculture has been reported in many developing and developed countries, such as China, Indonesia, Israel and at several places in Germany. It has been suggested that Calcutta metropolitan area and also other metropolitan areas in India should develop a combined waste water treatment and recycling system, including fish production, because a system based on solar energy and the fertilizing capacity of waste water is ecologically sound and should generate good income to pay back capital and money expenses.

SUSTAINABLE URBAN DEVELOPMENT - CASE STUDY OF NAVI MUMBAI (NEW BOMBAY)

Background

3.38 The Navi Mumbai (New Bombay) project on the mainland across a major creek (Thane Creek) from Bombay is a unique project by virtue of its size (it plans to accommodate 2 million people) as well as by virtue of the method of financing its development. The development of Navi Mumbai is aimed at de-congesting Bombay in respect of both population and activities by shifting of industrial, market and office activities to a new city which is sustainable — physically, economically and environmentally.

Sallient Features

3.39 This project has also been a testing ground for many new approaches in physical planning; land assembly; public-private partnerships in provision of municipal services; maintenance of properties by resident condominiums; greening of public spaces, and public-public partnerships for financing transport infrastructure projects.

3.40 Navi Mumbai's development strategy has been market driven and is dependent on private response to the opportunities opened up by public authorities. The key component in this is the use of land as a resource for development rather than dependence on State or Central budgetary resources. To encourage the role of the agency as the facilitator in the provision of housing, CIDCO has developed a combination of housing schemes to address the needs and requirements of different socio-economic group in the population. These include:

- User's participation in housing for the urban poor;
- Participatory developers' scheme; and
- Special drive for allotment of plots to cooperative housing societies and staff housing by institutions/corporate bodies shifting to New Bombay.

3.41 In the process of development, CIDCO has used innovative approaches involving a very large number of small firms for the maintenance of key urban services amenities on an annual basis. The experience of Navi Mumbai in new integrated sustainable urban development through public-private partnerships

has been able to create a new form of environment. The Navi Mumbai experience has started yielding the fruits of planned interventions not only in decongesting Bombay but also in the regional context in arresting migration to Greater Bombay. The success of the implementation has demonstrated that by using innovative methods, the city's development can serve commercial objectives based on market forces, and at the same time, achieve social goals.

SLUM NETWORKING - A COMMUNITY BASED SANITATION AND ENVIRONMENTAL IMPROVEMENT APPROACH: EXPERIENCES OF INDORE, BARODA AND AHMEDABAD

Background

3.42 The aim of the programme is to integrate slums through 'slum networking' into the total city fabric in a manner which benefits the whole city. This calls for an integrated approach both spatially, as well as, in terms of activities such as community development, income generation, education, health improvement, physical upgradation and environmental improvement.

3.43 The study focuses on the experiences of three cities-Indore, Baroda and Ahmedabad. Indore project, executed by Indore Development Authority with financial assistance from Overseas Development Administration (ODA), UK, has led to a sustainable development benefitting the urban poor, as well as the other citizens. In Baroda, the concept is being carried forward through a pilot project with a greater emphasis on self-help and community control using the community savings and

loan mechanisms developed by a NGO - Baroda Citizens Council. In a subsequent evolution, the Ahmedabad project attempts slum upgradation and infrastructure development with greater convergence between the communities, corporate private sector and the local government in order to establish mechanisms of development which can be consistently replicated.

Sallent Features

3.44 Analysis of several cities of India has shown a close correlation between slum locations and the natural water courses (nalahs) of the city. The introduction of the concept of "slum networking" has been one of the main innovations which upgrades the entire city in an integrated manner using slums not as isolated pockets but as a part of an urban net. The spatial spread of slums over a city with contiguity between slum settlements offered an opportunity to strengthen city level infrastructure networks.

3.45 The concept of "slum networking" with a holistic approach in evolving solutions through proper engineering design and participative solutions, holds a promise of tackling the problems of slums and squatter settlements. This concept is being modified for application in the cities of Baroda and Ahmedabad through a community-oriented approach which does not see slums as resource-draining liabilities but, instead, views them as opportunities for urban transformation. Slum networking is a holistic frame which converges scales, activities, agencies and resources, and it exploits the slum fabric in the context of the total city for sustainable and cost-effective improvement of the quality of life of its people as a whole.

4. INSTITUTIONAL SETTING FOR ENVIRONMENTAL MANAGEMENT

4.1 Proper institutional setting is a pre-requisite for improving urban environmental problems. The key elements that shape the institutional setting for environmental management are:

- i. the key actors in the public and private sectors whose charter affect the environmental management role each actor is expected to play;
- ii. the management functions that are used to address environmental issues in cities, including instruments of interventions and mechanisms of co-ordination; and
- iii. the existing constraints and initiatives that affect efforts to manage environmental problems in cities.

This section explores the relative roles of these elements in the ten best practices.

Key Actors and their Roles

4.2 The public sector agencies at Central, State and Local level institutions, are mainly concerned with policy instruments pertaining to pollution control, waste management, setting of environmental standards and monitoring and enforcement measures. Functions of the local governments include water supply, sewerage and drainage, solid waste management, sanitation, road maintenance, street lighting, maintenance of public parks and libraries, public health, etc.

4.3 There are some functions which are of a concurrent nature, being performed both by the state governments as well as the municipal bodies. In order to perform certain functions, state governments have created para-statal agencies and in some other cases which, strictly speaking, fall within the functional domains of higher levels of government, the municipalities have been assigned the responsibilities.

4.4 Apart from the regular legislative and institutional arrangements available in India at national, state and local levels, many special purpose institutions have also been setup to cater to short term and/or special requirements, such as the Central Ganga Authority (1985), and the National Wasteland Development Board (1985).

Local Government

4.5 Recent initiatives have lately entrusted municipalities with new powers and functions to deal with the issues pertaining to urban environmental management. Almost all research studies, taken up in this project, have acknowledged the importance of this level of governance and have acknowledged their role with new set of responsibilities anticipated for replication and scaling

up of the practices. This shows that these agencies would be able to make a significant contribution in local environmental management.

4.6 There is often a gap in the operation of Development Authorities and Municipalities. The former being entrusted with developmental works leaves the latter to do routine maintenance work only. The study on Sustainable Urban Development discusses this issue for Navi Mumbai (New Bombay). The City and Industrial Development Corporation (CIDCO) is an example of New Town Development Authority catering to specific objectives of decongesting the activities from Mumbai. Navi Mumbai Municipal Corporation (NMMC), as municipal corporation for part of New Bombay, has taken over planning functions of CIDCO with effect from 1992, while the status of CIDCO as a planning authority for these areas is not clear.

4.7 The 74th Constitution Amendment Act, 1992 (CAA) in India has assigned environmental management functions to the local bodies. Some functions are, at times, of a very local nature, requiring intervention of grassroot level institutions only. In this context proper demarcation of responsibilities among various key actors is important.

4.8 The 74th Constitution Amendment Act has classified the urban local bodies into three categories namely Nagar Panchayat, Municipal Council and Municipal Corporation, according to certain social and economic criteria. The organisational and fiscal strength of the above three categories of local bodies need to be kept in view while assigning them environmental management functions. The role of existing central and state level environment agencies are also to be considered in this context.

4.9 The 74th Amendment has further elaborated the role of the local bodies in preparation of plans for economic development and social justice, slum improvement and upgradation and safeguarding the interests of the weaker sections of society.

4.10 The planning concept has undergone a change from land-use to development planning and local bodies have become the key actors in urban management as their role has changed from maintenance of services to key partners in policy formulation.

NGOs/CBOs

4.11 Non-governmental Organisations (NGOs) and Community Based Organisations (CBOs) have recently assumed a positive role in the development process. It is evident from the studies that they have successfully demonstrated their capabilities of filling administrative and management gaps in governmental functioning and at the same time have brought both community and government together to agree and plan for mutual interests. The role of these organisations have been appreciated in Indore where they motivated the community for this programme and at the same time also mobilised resources from slum dwellers.

Thrift and saving and loan societies form the backbone of resource mobilisation within the community in the slum improvement programme in Indore.

4.12 NGOs and CBOs have enough capabilities of acting as facilitators to the formal agencies. Solid waste management at neighbourhood level is one such example. NGOs and CBOs have motivated residents to accept a systematic way of garbage collection, segregation and neighbourhood disposal of organic waste. The result is that the local body has been relieved of part of their duty of door-to-door collection. The traditional practices of wetlands also indicates that the rural folk are helping the local body by treating and resource recovery from waste water.

4.13 The role of NGOs is not just limited to communicate community view-point to the government but they could also contribute in hardware implementation. Low-cost sanitation is one area which has shown success entirely through NGO involvement. They have motivated the community and at the same time also implemented the technology at household and community level. Community based organisations also proved to be cost-effective and efficient compared to government agencies as in the case of Kanpur where maintenance, construction and rehabilitation works of hand pumps, low cost sanitation units, pathways, and water pipes was entrusted to them.

4.14 Advocating formation of pressure groups to pressurise formal agencies has also been successful as mentioned in the study done by Development Associates. This study through the three cases of Clean Ganga Campaign, Varanasi, Save Shahpura Lake Campaign, Bhopal and Mudialy Fisherman's Cooperative, Calcutta has demonstrated how NGOs ultimately motivated the local community to make pressure groups and make an impact on government to modify its approach taking into account the popular view.

Private Agencies

4.15 Although private agencies have primarily remained associated with industrial activities of development, it is very recently that they are becoming associated with city management issues. In Ahmedabad, the Slum Networking approach has been taken one step further by replacing external aid by contributions from the city's industries so as to augment resource needs of both slum dwellers and municipality.

4.16 Solid waste management, particularly its disposal aspect, has also generated a lot of interest among private enterprises. Institutions such as Western Paques (India) Ltd., Excel Industries Ltd. and Terrifirma are engaged in resource recovery from decomposition of organic wastes.

4.17 The involvement of private sector, particularly small-scale industries, was also sought for improving urban environment. This was brought by the studies in electroplating sector and tanneries in Kanpur. It was however found that these

industries are facing a two fold problem, firstly by creating pollution in the vicinity of their location and secondly by draining out valuable resources which could add to their economy, if recovered. These two studies demonstrated the financial and physical advantages of resource recovery.

MANAGEMENT FUNCTIONS

4.18 Several Agencies/Institutions together deal with the specific objectives like protecting the wetlands. In Calcutta, the Departments of Forests and Environment, Fisheries, Irrigation and Waterways, Calcutta Municipal Corporation, Calcutta Metropolitan Development Authority (CMDA), Department of Rural Development, Panchayats and Zilla Parishad, Department of Land and Land Records, Institute of Wetland Management and Ecological Design (IWMED) under Government of West Bengal, Geological Survey of India, Zoological Survey of India and Botanical Survey of India under Government of India are connected with the problems of East Calcutta Wetlands.

4.19 The Department of Irrigation and Waterways controls all the channels passing through East Calcutta wetlands. Though most of the delineated areas of East Calcutta Wetlands lie outside the Calcutta Metropolitan District, CMDA however has prepared drainage development plan of the area. Many other projects on the fringe of the wetlands have also been undertaken by CMDA. The Waste Recycling Region has also been delineated based on an earlier survey made by IWMED. This includes the area where sewage water is used either for fisheries or crop farming.

4.20 In Mumbai (Bombay), a new Regional Corporation became necessary for the BMR which, besides the planning and coordination works, was also expected to undertake a special responsibility of setting up the new townships.

4.21 In Navi Mumbai, the Government of Maharashtra appointed CIDCO, as the New Town Development Authority. While doing so, however, the government retained with itself the ownership of lands and required CIDCO to work only as an agency to do certain works on its behalf.

4.22 In other New Towns, however, CIDCO is a Special Planning Authority and also an owner of the land and other assets. These projects were much smaller, both in physical and financial terms, as compared to Navi Mumbai. Navi Mumbai has been a successful venture because of absence of local authority and physical separation of site. But in other cities the conflict between local authorities and municipalities continues to exist. With the Municipal Corporation taking up planning function of CIDCO in Navi Mumbai, the status of CIDCO as a planning body becomes ambiguous.

4.23 Similarly, there was also lack of clarity in the management responsibilities of small scale industries where Directorate of Industries, Directorate of Factories, consultancy agency such as National Productivity Councils, Central Leather Research

Institute, State Pollution Control Boards and the like are involved. To add to this list, municipality being the city governing agency has the prime responsibility of mitigating pollution measures.

4.24 The management functions provided by NGOs and private sector have demonstrated greater degree of flexibility at organisational and functional level. Work responsibilities have been clearly divided and boundaries of operation were marked distinctly to avoid any duplication. Since these organisations had a genuine problem of resources, they depended on extensive networking with the institutions specialised in the field. In Bhopal, when thousands of fish died in Shahpura Lake due to high degree of contamination and low oxygen level, three prominent NGOs established networking among themselves in achieving the common goal of saving the lake from pollution. The three organisations complemented each other in campaign management, action programmes and technical studies. National Centre for Human Settlement and Environment (NCHSE) provided overall leadership and made contacts with the bureaucracy in coordination meetings.

4.25 The style of organisation of the NGOs also reflect in their success. The advocacy movement for clean Ganga is operated through a registered society. The secretariat has its own office with necessary arrangements for meetings. The water quality testing laboratory is also established near the office of the society, therefore, the concerned members look after the activities of the society as well as of the laboratory. Because of the demand for regular monitoring of data, the core team members visit the laboratory and the Society everyday.

4.26 The team has clear-cut division of responsibilities in the laboratory. There is a chemical engineer, who looks after the monitoring and analysing the water samples collected both upstream and downstream. The leader of the group participates in meetings, prepares write-ups for circulation and publication. He is assisted by a professor who develops rapport with experts, professionals, bureaucrats and politicians to utilise their services for the campaign. A civil engineer has the responsibility of all possible interventions related to disposal of sewage downstreams. Clean Ganga Campaign suggested various alternative methods of sewage treatment by conducting studies and surveys.

4.27 Sometimes, part-time involvement of the core team (in case of Clean Ganga Campaign) and short-term objective (in case of Save Shahpura Lake) account for poor organisational management systems. Absence of permanent staff account for limited vision for skill upgradation.

4.28 The Mudialy Fishermen's Cooperative Society largely focuses its management on fishing and related activities for their livelihood. The cooperative functions in a democratic manner. However, the elected executive members look after administrative and accounts matters.

Coordination and Decision Making

4.29 To address environmental problems associated with urban

management, the relevant actors should participate in a strategic and coordinated environmental planning and management process that takes into account the inter-relationship between different relevant institutions and policies. Sometimes, the government's actions consist of adhoc responses to specific local pressures such as raised by NGOs about private builders encroaching wetlands or municipal drains being polluted by industrial wastes. This approach is more common than coherent sustained programmes of incentives, regulation and enforcement. Most governments at the local level lack trained personnel and the financial base and autonomy to provide necessary investments, services and development control. This weakness of city governments also makes other changes difficult to implement - from the enforcement of environmental legislations to the efficient collection of garbage, management of solid waste sites, and so on.

4.30 One of the most critical roles of city and municipal government is providing the institutional means to ensure that the combination of all sectoral policies and actions achieve a balance between social, economic and environmental goals. The attitude and policies of local governments to the use of city resources and waste is a major factor in achieving such a balance. Waste pickers and waste related activities are generally regarded as illegal or unhygienic without appreciating the extent of social, economic and environmental advantages or the kind of public provision and support which retain the economic and resource advantages, while reducing health risks and improving incomes for the poorer groups engaged in it. The case of Indore Habitat project and experiments in cities such as Rajkot and Ahmedabad are examples of managing urban affairs with coordinations among the local-level institutions, the stakeholders and other interested groups. The environmental awareness campaign of NGOs plays a strong role in the process of coordinated decision making while the new town development activities in New Bombay is an example of coordination at different levels of government institutions.

Some Broader Issues

4.31 The major experiences on institutional setting that emerge out of the ten best practices, could be summarised as follows:

1. Multiplicity of organisations with unclear mandate has resulted in overlap in functions pertaining to containing urban pollution. This in turn has weakened the local bodies as most of their functions have been encroached upon by the creation of new institutions.
2. NGOs and private sector are normally created with specific objectives and for specific purposes and therefore tend to have a clearer division of tasks. At times, NGOs have also engaged in networking to deal with specific and complex city issues.
3. Poor inter-governmental coordination has resulted in

failure to involve people in decision making. Partnerships with NGOs have shown signs of hope as they have been successful in attributing to the slum dwellers and other disadvantaged groups a more positive role in urban management and city development process.

4. Lack of clarity and overlap in operations often leads to poor inter-governmental coordination. This has resulted in taking less popular decisions that may

affect a large proportion of city population particularly urban poor.

5. The trend is now reversing and local bodies are again in the limelight with new powers and functions accorded to them under the new Constitution Amendment.
6. To deliver urban services, government has also started operating on popular partnerships in selected sectors.

5. LEGAL AND REGULATORY FRAMEWORK

5.1 Legal and regulatory stipulations lay down a framework of environmental planning and management and also emphasise the government's commitment to abate pollution. Legal and regulatory framework is needed to mitigate or prevent environmental degradation. Such a framework provides command-and-control approach to environmental management. A good regulatory framework and effective monitoring and enforcement mechanism are complimentary to each other. Strong regulation with poor enforcement remains ineffective and vice-versa.

Constitutional Provision on Environmental Protection

5.2 The Constitution of India is one of the few constitutions in the world that contains specific provisions on environmental protection. Environmental protection and improvement have been explicitly incorporated in the Constitution by the Constitution (Forty-Second Amendment) Act of 1976. Article 48A says: "The State shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country". The "State" here includes local governments such as municipal corporations, municipalities and panchayats as well.

5.3 Article 51 A(g) imposes a similar obligation on every citizen "to protect and improve the natural environment...". Judicial interpretation has strengthened this constitutional mandate. The courts have declared that "the right to a wholesome environment" is included in the fundamental right to life (Article 21).

5.4 Various acts pertaining to the protection of natural resources like air, water, wild life, flora and fauna, eco-system, and so on were also simultaneously formulated by the Central Government. The most significant being Environment (Protection) Act, 1986 which empowered the Central Government to take all necessary measures to protect and improve the environment. The rules were promulgated under the Act to regulate hazardous industrial processes and to make mandatory environmental impact assessment or environmental auditing for large projects in order to obtain a licence.

5.5 The licensing regime supplemented by 'citizen suits' provision together with a statutory right to information, now enable an aggrieved citizen to directly prosecute a polluter after examining government records and data. Mandatory worker's participation in plant safety, stringent penalties for breach of safety regulation and vesting more administrative powers in enforcing agencies are some positive steps. In 1992, the Ministry of Environment and Forests adopted a pollution abatement policy which includes adoption of cleaner technologies, conservation of resources, adoption of concentration based standards to mass based standards, incentives for pollution control, public participation and eco-mark on environment friendly products.

5.6 Municipal Acts are the first legislations in the country which provide for the abatement of environmental pollution. Environmental pollution as such is not defined or dealt with under municipal enactments, but the provisions which deal with the prevention or suppression of nuisance are generally aimed at combating pollution at local levels. There are provision in the municipal law which aim at preventing the pollution of air, water and soil by prohibiting the indiscriminate disposal of domestic wastes, misuse of water courses and drains and prohibiting certain trades or requiring them to make structural alterations in their factories if they commit nuisance. These functions, are however, not being used mainly because of the financial, managerial and technical constraints within the municipalities.

Decentralisation

5.7 The 74th Constitution Amendment has acknowledged the role of local bodies in city management by entrusting them with more powers and responsibilities. The functions and schemes to be implemented by municipalities are listed in the Twelfth Schedule. Protection of environment and promotion of ecological aspects is one of the functions enumerated in the Twelfth Schedule apart from urban planning, planning for economic and social development, public health, sanitation, conservancy and solid waste management, and slum improvement and upgradation. This amendment has also vested environmental management at local level with municipalities.

Small Scale Industries

5.8 The two pre-requisites to establish an industry are licensing and registration. Licensing permits the process and product for a particular industry while registration enables them to apply for place of operation, infrastructure facilities such as water, power, financial assistance and import/export of machinery and raw or finished product.

5.9 Registration for small scale industries are voluntary in India. It is however, done in two stages:

- a) provisional registration
- b) permanent registration

In the first stage the unit has to apply for a licence from the local or state level body. Then it is eligible to apply for allotment of factory sheds, plots, water and power connections, liberalised financial assistance and so on. When all these allotments are completed, the unit gets a permanent registration number.

5.10 The study on tanneries in Kanpur and electroplating industry in Delhi has brought out the fact that environmental legislations have not yet proved very effective in the absence of accompanying structural framework. The two major impact areas identified in these studies pertain to:

- improvement in the production process to reduce waste generation and recover as much resource as possible from waste
- disincentives or taxes for those who cause pollution

5.11 Although an effort was made to modify the production process and to recover the resources which were otherwise going down the drain, the practice did not pick up as it was not linked with disincentives for pollution being generated by the industries not adopting the practice. The combined effluent treatment plant also collects a flat rate as contribution for its O&M rather than a more rationale rate based on the quantum of each unit is generating. The legislation therefore needs fairly systematic monitoring and enforcement machinery for its success.

The Popular Practice in East Calcutta Wetlands

5.12 India as a contracting party to Ramsar Convention, is obliged to protect and conserve the existing wetlands of the country. However, there is no single Central/State legislation relating to wetlands, and it is only through laws on peripheral subjects like lakes, eco-fragile areas etc., that encompasses the issue of wetlands. No statutory authority has been created for wetlands under law, to oversee protection, conservation, management and to take appropriate penal measures for the violation of laws and regulations. Though different laws provide a number of avenues to seek redressal of environmental wrong, it is difficult to serve specific cause of wetlands protection.

5.13 A NGO named People United For Better Living in Calcutta (PUBLIC) and another NGO instituted a writ petition against the State of West Bengal challenging the attempt of the State Government to reclaim the wetlands on the eastern side of the Calcutta metropolis for proposed World Trade Center to promote trading activities, not only of Calcutta but also of the country as a whole. It was moved that the law courts would not be justified in granting such a proposal for private gain at the cost of the society at large. It was contended that the conservation of wetlands in this part of the city is necessary for the protection of environment and there should be a balance between development and environment.

5.14 The Central Pollution Control Board has the power to obtain information and to plan a comprehensive programme for the prevention, control, or abatement of pollution of 'wetlands', and secure execution as well.

5.15 Various experiments with the legislative and regulatory framework in India have established the need for proper linkage among the implementing authority and the stakeholders in realising the goals of urban environmental management. The stakeholders require suitable flexibility within the existing framework for successful implementation of the schemes if a change in legislation is a long term affair.

Land Development

5.16 The new town development efforts in New Bombay is an example of introducing suitable flexibility within the framework.

5.17 Urban land management becomes particularly difficult if regulatory framework are not modified to suit the developmental objectives. In Maharashtra, CIDCO found it rather difficult to operate under the existing Land Acquisition Act (1894) as it could not carry out innovative schemes pertaining to new town development. There was local opposition to those schemes and land acquisition procedures suffered at every step. These schemes implied willing participation of the land owners, which they did not do. Taking over the possession of land for urban development was opposed tooth and nail by the landowners and led to a major law and order situation on many occasions, leading to use of force by the authorities.

5.18 Land Acquisition Act provides for a reference to the civil court for determination of proper compensation in the event a dispute is raised. A large number of land acquisition awards declared end up in civil courts which have generally enhanced the compensation. This has affected the urban development schemes in two ways: firstly, affecting its financial viability with unforeseen increase in project cost, and, secondly, increasing the administrative load.

5.19 Over the last two decades, some other alternative methods of land acquisition have become available. The Land Acquisition Act has been amended to provide for "Consent Award", wherein the acquiring authority can negotiate with the land owner to arrive at an agreed amount of compensation. Equally important is the amendment of the Maharashtra Regional Town Planning Act (MRTP Act). This amendment provides for direct negotiation, without the authority of land acquisition officers, with the land owners. This approach has been tried by CIDCO in some new towns. Land for growth centres were taken over from owners with a promise to give them compensation within six months or to give alternate land. CIDCO therefore decided to resort to the amended provision of the MRTP Act.

5.20 Besides a new innovation providing for a participatory approach to land development has also been adopted. In one of the methods adopted by Bombay Municipal Corporation, the owners are provided with Transferable Development Rights (TDRs). In this, an owner of land, whose land is acquired for a public purpose gets a TDR, which permits him to use equivalent FSI on any other piece of land of his own ownership or to transfer the TDR to any other land holder. By implementation of the technique, the development right of a land owner can be physically shifted from its original location. By this technique, land under different public reservations can be treated at par with the land under any other profitable use. Thus, the whole land can be made saleable, bringing economic justice in cases where only selected lands are to be acquired.

5.21 Yet another alternative is participatory land development, that is, to acquire only a certain percentage of land from all owners and use the acquired land for providing public services and also for compensating the owners whose lands have to be perforce fully acquired due to factors such as their location.

People's Involvement

5.22 Many voluntary groups, NGOs, active resident groups and professionals have taken up the task of advocating their rights and remind local bodies of their duty to contain environmental pollution and degradation. There also have been cases where petition has been launched against local agencies for not discharging their duty in maintaining a pollution free environment taking into account that judiciary has recognised the right to a wholesome environment as an integral part of the right to life.

5.23 The case studies related to Clean Ganga Campaign and Save Shahpura Lake Campaign were precisely able to convey the message, resulting in a massive programme for cleaning of River Ganga in the first case and cleaning and beautification of Shahpura Lake in the latter.

5.24 Sulabh International Institute of Technical Research and Training has also been successful in its liaison with local bodies, this is important, because of their obligatory function of sanitation in the town and central government's policy of liberation of scavengers. These case studies therefore prove

that initiatives taken by NGOs or Citizen forum really matter in enforcing laws and legislations which have been in existence for years together but failed to have the desired impact.

Some Broader Issues

5.25 The main issues that emerge from these discussions could be summarised as follows:

- (1) Indian Constitution provides for specific provisions on environmental protection. Different laws and legislations have been formulated to facilitate the governments at all levels in environmental management.
- (2) NGOs and citizens have played important role in making government to follow the specific mandate of providing pollution free environment to the citizens.
- (3) Poor enforcement and monitoring mechanisms overshadow the consistent and far-sighted laws and legislations formulated to contain pollution.

6. FINANCIAL FRAMEWORK

6.1 Effective city management requires a flexible financial framework. New fiscal strategies and powers for effective urban governance are required in support of local initiatives, in the conservation and environmental improvement of the natural and cultural characteristics of cities and in the provision of urban services.

Finance, Municipalities and State Government

6.2 The 74th Constitution Amendment Act, 1992 in India attempts to establish suitable financial framework for democratic decentralisation. It has tried to evolve suitable criteria for municipalisation as well as improve their fiscal capacity for providing the services.

6.3 The State Finance Commissions constituted under the 74th Constitution Amendment Act are presently examining the relevant factors based on consideration of the fiscal capacity of the local bodies and the users, topography and geology of the settlements concerned, the past history of infrastructure development, population size and other economic and political factors. These Commissions are now finalising the principles of distribution of fiscal power between the states and the local bodies.

6.4 The financial requirements, even for minimum levels of services, both on the capital and revenue accounts, are enormous. New initiatives are required for mobilising the required resources for effective governance by the local bodies.

6.5 While the metropolitan cities, undoubtedly, play larger regional and national roles, even small towns can play such roles. Financing of the special requirements of such towns and cities, such as a mining town catering to exports, is different from that of a town which caters to local needs only.

6.6 The allocation of financial powers and responsibilities needs to be consistent with the territorial and functional jurisdictions and responsibilities as per the existing constitutional/legal frameworks. In other words, the question is whether for any given level of government, there is a mismatch between expenditure responsibility and revenue authority.

6.7 For smooth functioning of the local bodies, it is required that in State-Municipal relations, the lower levels of governments should not be required to depend on the whims of the higher levels of government for their financial needs. Whatever they get must come to them through either constitutional rights or through the dictates of the Legislatures or on the basis of clear-cut policies which, in the light of the possible internal revenues, should match the expenditure responsibilities with appropriate fiscal transfers. Such transfers would, undoubtedly, include assigned revenues and shared taxes, capital and revenue grants and development finance.

Finance and Urban Development

6.8 A major instrument for generating financial resources is land development. City and Development Corporation (CIDCO) of Maharashtra State has tried some innovative approach for

providing linkage between finance and supply of urban land. Land was identified as the main resource for financing the multi-faceted development projects in New Bombay Project area. However, the value of land at that point of time was very meager, owing, to its physical disposition and low agricultural productivity. Its urban potential was minimal too because to lack of linkage with Bombay and virtual absence of other infrastructure such as roads, tele-communications, schools and hospitals. Thus, though there was an impressively large area of land made available to CIDCO, it was not of much financial consequence in its then existing raw and undeveloped form. It was essential for CIDCO to enhance the value of its assets so that they could be a lucrative source of finance for development expenditure.

6.9 The construction of commuters railway lines resulted in increasing demand for land for residential and commercial purposes. CIDCO sold the plots (acquired by the State Government earlier and transferred to it free of cost) to private developers and triggered of a self-sustained momentum of overall growth which is vividly reflected in rising land values.

6.10 The shifting of the market for agricultural produce and warehousing activities of steel trade from Bombay to New Bombay marked the heralding of economic development activities. Large scale housing development as well as planned development of office complexes followed thereafter.

Finance and Low Income Settlements

6.11 The experience in the city of Indore, on the other hand, reveals the mobilisation of finance from internal sources for maintenance purpose as an effective way of sustainable development of urban environment.

6.12 The greatest advantage of slum networking, its catalytic nature as well as its strong emphasis on public participation, huge resources from the private sector as well as direct contribution of the beneficiaries, came into play. The concepts of 'affordability' and 'cost recovery' are not new. However, the resources which the poor can marshal are generally underestimated.

6.13 By using networking, the cost of the intercepting drains was met from the slum sanitation budget. All other improvements and the landscaping was made self financing. As the river banks improved, it was realised that shops and other economic activities compatible with recreational use could be introduced. The incomes from these sources exceed the costs of environmental improvement.

6.14 Huge resources currently being expended for poverty alleviation under various programmes may be converged with the resources which can be mobilised from within the slums. Studies undertaken in many cities in the country have shown that the slum dwellers are willing to invest for water and

sanitation. In Baroda, in a slum upgradation pilot project, slum community motivated by a NGO (Baroda Citizen Council) have mobilised resources for laying services in the slum on sharing basis with Baroda Municipal Corporation. In Ahmedabad, the municipality, the private sector and the slum dwellers are jointly mobilising resources for environmental improvement through provision of basic services. Environmental improvement of a larger area requires financial commitment from higher level authorities.

Finance, Municipalities and Central Government

6.15 The Ganga River Cleaning Programmes in India are so far implemented by the State Governments with cent per cent assistance from the Central Government but the expenditure on operation and maintenance of assets created under the programme, is shared between the centre and the states for first three years and subsequently the complete maintenance expenses is borne by the State Governments. However, to obtain an effective involvement and motivation of the States concerned in National River Conservation Programmes, the Centre and States participate equally in capital costs while O&M burden is squarely on State agencies, through cost recovery and efficient service delivery. The provision of resource recovery by way of production of power from methane, treated water for irrigation and sludge as manure, under the IDP, did contribute towards the operation and maintenance cost, however the major portion of O&M cost had to come from the general revenues of the States. In general, State Governments and the local bodies with whom the O&M of the facilities rest, have always been facing resource constraints; as a result some of the facilities in course of time run the risk of becoming defunct.

6.16 Poor resource base of the local bodies stands in the way of economic gain from environmental improvement. It is increasingly being felt that resources for O&M should come from the users of facilities. With launching of Ganga Action Plan, water supply in Jajmau area of Kanpur increased substantially. Similar improvements were noticed in sanitation facilities. These property-based developments, however, were not reflected in enhanced property tax.

Local Body Financial Resources

6.17 Resources at the local level are raised through water and sewer taxes. If the house is actually connected with the water system, the owner has to pay an additional charge which is

proportionate to the volume of water consumed. For billing and collection of revenues, the local bodies depend upon the number of properties that have been officially registered. A study conducted in this regard revealed that out of an estimated 0.3 million properties in the city of Kanpur, only 0.1 million have actually been registered by the Kanpur Nagar Nigam. As a consequence, Kanpur Jal Sansthan collects only one-third of the potential revenue income of about Rs.0.8 million which is hardly sufficient to cover the salaries of its 2500 strong staff. Similarly, the Kanpur Nagar Nigam which looks after other civic amenities such as street lighting, storm water drainage, garbage disposal, public health, has poor revenue collection owing to non-registration of many properties and under-valuation of the registered ones. Yet another study revealed that half of water supply connections in Kanpur were unauthorized. This, did not allow the authorities to collect the water charges and made it impossible to carry out leak detection programme to prevent losses due to physical leakage.

Finance and Community

6.18 Some NGOs such as like Sulabh International have largely been effective in maintenance of the service. Sulabh takes up the construction of individual and community latrines, as a project, assigned by the local bodies. Such projects are covered under the Low Cost Sanitation (LCS) programme of the Government of India. Sulabh International recovers the cost of construction from the municipalities and provides maintenance services for five years at a charge of 20 per cent of the cost of construction, again to be paid by the local bodies. User charges are also collected from the community toilet users. The maintenance of these facilities thus is not dependent on the resources generated locally.

6.19 Prospects of economic gains owing to the improvement in environment have been a major determinant in taking up such measures. In Jajmau area, some tanneries have been motivated to set up chromium recovery plants after the cost-benefit analysis has been carried out. But most of them are still reluctant to carry out such activities.

6.20 Small-scale industries like electroplating units generally operate on low and uncertain profit margin. As there is no fiscal incentive for adopting waste minimising measures, they are reluctant to increase production cost with expenditure on measures for minimisation of pollution.

7. PARTNERSHIPS

7.1 Partnerships in various forms has become the key word as government's role in urban management is felt to be constrained by several factors such as institutional inflexibility, financial inadequacy, and so on. Partnerships at various levels and in various forms are being tried in order to face the challenge of urbanisation. Partnerships between the different actors - NGOs, community organisations, business and commercial enterprises, local, state and central governments are needed for urban environmental management. In India, a variety of experiments have been witnessed with different degrees of success.

7.2 The Constitution Amendment Act, 1992 has set the platform for increasing people's participation in urban environmental management. People's representatives in the local bodies have a positive role in all matters related to development planning, which hitherto has been dealt by the bureaucracy. This will enhance the role of people's organisations in promoting environmental awareness for directing the cause of development planning.

7.3 The Indo-Dutch Project (IDP) for Cleaning Ganga has initiated a programme with strong focus on communities and their involvement in planning, implementation, operation and maintenance of the project. The involvement of the communities through change agents was done to create a sustainable set up for community participation in effective utilisation of the installed capacities. They have formed the potential nucleus for community level organisations, which in turn are able to communicate directly with the available governmental infrastructure on the one hand and also mobilise community manpower.

7.4 During the inventory phase, a number of surveys and in-depth studies were conducted and contacts were established with informal leaders at the community level. The contacts resulted in the establishment of informal groups of men and women in selected slum areas. Direct communication lines were established between the field staff and the community via their representatives, mainly the community volunteers.

7.5 The project facilitated the formation of area level organisations (ALOs) or mandals. These mandals enhanced the activities in the community, brought about marked cohesiveness and finally resulted in the formation of an apex body through voting.

7.6 The experience clearly demonstrates that with the involvement of the ALOs in the formulation and implementation of project schemes, not only can project costs be reduced but also the quality of works can be improved considerably compared to those done through agencies by outside contractors. In addition, it enhances community participation in the overall development process.

7.7 The involvement of community in dealing the user aspect of technical inputs has been proved to be strategically the most important. The ALOs and trained agencies of change fully

participated in the decision making processes for i) selection of priority areas, ii) prioritisation of area specific needs, and iii) preparation of area development plans.

Residential Condominiums

7.8 Dwelling units in New Bombay are organised in the form of residential condominiums, each accommodating 100 to 200 units. It is mandatory to form and register condominium associations with elected representatives. These condominiums are responsible for maintaining the common built-up and open areas as well as the physical infrastructure within their boundary. A monthly subscription is collected from association members and special contributions are arranged when periodic building repairs or area development works are taken up. This, ensures participation by the residents in the maintenance of infrastructure at a decentralised level, condominiums have also proved to be acting as cohesive social units where innovative ideas can be introduced. In such condominiums, women members of resident condominiums have taken the lead to propagate waste segregation at source and vermi-composting.

7.9 A different type of partnership has been experimented by CIDCO in New Bombay by encouraging public-private as well as public-public partnership.

Public Private Partnership

7.10 In the absence of any local authority till January, 1992 and thereafter due to lack of financial resources with the newly created New Bombay Municipal Committee (NMMC), CIDCO has been providing all kinds of municipal services in New Bombay. NMMC has recently taken over the provision of municipal services in the village site areas, which fall in both New Bombay project area as well as outside it, but within the jurisdiction of NMMC. For the provision of municipal services, CIDCO has relied completely on the process of "contracting out". These contracts are generally in sanitation and sewage management sector.

Private Sector Involvement in Maintenance

7.11 Services such as maintenance of sewage treatment plants (STPs), collection of CIDCO's dues, maintenance of water supply, development and maintenance of parks and gardens have all been contracted out.

Lessons of Privatisation

7.12 After enumerating the instances of privatisation, it will not be out of place to list out the specific lessons and benefits of privatisation. These are:

- a) It helps to keep the public sector lean and therefore more professional. In CIDCO, there has been less than 5 percent annual growth in manpower since 1990-91 whereas growth in turnover (measured by

expenditure on works alone) is over 63 percent. This has been possible by appointment of PMCs for construction works and of contractors for municipal and other recurring items of works and service delivery.

- b) Professionals in the public sector focus more on planning and land development work, as recommended by the National Housing Policy, as the new role of a Development Authority.
- c) This may provide indirect employment to a large number of Project Affected Persons. (PAP) There are 24 PAPs working as contractors in public health works in CIDCO and over 75 in maintenance of parks and gardens. These contractors in turn employ large number of PAPs as workers.
- d) This may also lead to development of an entrepreneurial cadre amongst the PAPs as is evidenced by the number of independent labour and civil work agencies floated by them in New Bombay.
- e) This method may be more cost-effective, at least as far as contracting of municipal services is concerned.
- f) Legal framework, unfortunately, is not conducive to more effective performance owing to limitation on contracting out regular works, restrictions on regulation of employment of workers and other such rules. In New Bombay, for example for security contracts, employment has to be through State Security Guard Board, which takes away the owner's ability to enforce conditions of contract fully.

7.13 The programmes must not be projected as a government scheme but instead as a community initiative in which the government and the private sector are partners. Pressure from the other community participants ensures that defaults in repayment are minimal. In a government run scheme, people would expect that the loans are written off.

7.14 CIDCO has tried another novel experiment in partnership with involvement of other public agencies. For example, it shared two-thirds of the cost of commuter rail corridors while the rest came from the Ministry of Railways. It was for the first time in the history of railway development in India that such a sharing pattern was adopted. CIDCO has also shared the cost of other infrastructure, namely water-supply with Maharashtra Industrial Development Corporation (MIDC). With regard to electricity and telecommunications, CIDCO provides developed land at subsidised rates for receiving stations and constructed sub-stations and telephone exchanges and service stations and in return New Bombay is provided with speedier infrastructure. Another public-public partnership established with Public Works Department (PWD) is by way of CIDCO paying all the energy consumption bills of street lights on 18 kms of

major transport corridor through New Bombay in return for speedier construction. Sewerage and solid wastes in the nodes of New Bombay are managed by CIDCO while in the village areas are maintained by NMMC, thus entering into jurisdiction-based infrastructure partnership.

Partnership Between Stakeholders and Facilitator

7.15 The community groups set up in slums can be used to make collections on house-to-house basis so that the financing institutions are relieved of this responsibility. The same groups can also be used to get some works executed directly by the slum dwellers through self help. In the Slum Networking approach which emphasises land management, landscaping, individual services and simple technologies, participation by the people themselves in their infrastructure development is possible.

7.16 Once the slum dwellers become joint financiers, their role changes from the recipients of charity to that of clients who have the right to be consulted and the right to demand the highest quality of work. Processes have to be developed for close interaction with the people. This would involve setting up community representatives, discussing development options, resource mobilisation, eliciting participation during execution and the subsequent maintenance. Best professional help should also be sought for surveying, planning, design, supervision and project management. There is a dearth of technical professionals who have the expertise and the sensitivity to undertake such works in the slums. They, nevertheless, exist and need to be identified. There is no reason for the work done in slums to be shoddy. An attitude of professional excellence must be inculcated.

7.17 Indore Habitat Project is an example of partnership between stakeholders and the facilitator. It clearly demonstrated that it is quite possible to address the problems of the urban poor, both physical and socio-economic, at micro and macro scales parallel with the infrastructure and environmental improvements of the city as a whole. The project was delivered through the conventional government mechanisms and funded from a bilateral grant.

7.18 In Baroda, a substantial proportion of the development funds (over 50%) are being raised internally from the slum dwellers. The control of development rests with the community. In Ahmedabad, the Slum Networking approach has been taken one stage further by replacing external aid by contributions from the city's industries so as to augment the resource needs of both the slum dwellers as well as the Municipal Corporation.

Non-Governmental Organisations

7.19 The participation of the NGOs along with residents welfare associations has shown to be one of the most fruitful avenues to bring about the amelioration of urban environmental conditions (in urban pockets and slums) by providing sanitation

services through implementation of Integrated Low Cost Sanitation and Scavengers Liberation Programmes. The NGOs have also implemented low-cost technology; for example biodegradable solid wastes have been separated for the production of bio-gas for cooking and mini-thermal power; deep tubewells are being excavated to supplement declining water supply; street sanitation, drainage and sewerage is being established and maintained by neighborhoods.

7.20 Experience of Sulabh International - an NGO engaged in construction of household and community toilets, has shown that the beneficiaries prefer an agency which is prepared to undertake the entire responsibility for the construction of toilets

as well as their maintenance. The well structured administrative set-up of NGOs such as Sulabh has introduced high degree of professionalism in their activities while keeping their contacts with the beneficiaries as well.

7.21 The NGOs working for environmental advocacy have also experienced that well-structured institutional set-up goes a long way in establishing sustainable partnership with the stakeholders. Local NGOs have set many examples in the provision of cheaper services in ways which are more immediately accountable to their customers. There is tremendous potential in new partnership between local governments, local community organisations and local NGOs.

8. GENDER ASPECTS OF URBAN ENVIRONMENTAL MANAGEMENT

8.1 Gender equality in matters of economic, social and political significance is a fundamental right guaranteed by India's Constitution to the 450 million strong Indian women as of 1991, who form roughly one-sixth of the world's women population. India has a fairly creditable record in the enactment of laws to protect and promote the interests of women. Using a Gender-related Development Index (GDI), the 1995 Human Development Report of UNDP places India at the 99th position among 130 countries in relation to the status of women.

8.2 Owing to the national policy for assigning equal status to women, the Constitution Amendment Act, 1992 makes elaborate provisions for reservation of seats for women in the local bodies. Not less than one-third of the total seats in the local bodies are now reserved for women. As the functional domain of the local bodies is extended to include functions like urban planning and environmental protection, women are likely to play increasingly important role in matters of development planning.

8.3 Inclusion of women in the power hierarchy of the elected local governments in India paves the ways for them to play their rightful role in the development process. It is too early, however, to assess the impact of this bold initiative. Nevertheless, it can be easily conjectured that local government is one area where participation by women would make an important difference as the government at this level deals mostly with the quality of life issues - an area which is most relevant to women's role in any society.

8.4 Women in any community provide a crucial link for integrated development scenario. The Indo-Dutch Project (IDP) at Jajmau, Kanpur provided an enhanced role for women. Opportunities for women for specific development activities were opened in areas where generally entry is restricted for women such as jobs for plumbers, fitters or masons.

8.5 In Jajmau, different types of skills training programmes were opened up for women under the IDP. To ensure that female masons could function independently of outside support as much as far possible, a cooperative of all such trained women was formed and they were registered under the Society's Registration Act as an independent society. After training, the women were assigned the task of constructing sanitary latrines by the Kanpur Nagar Nigam with advance payment.

8.6 As the work of rehabilitation of water supply programme for Jajmau, Kanpur both the executing agencies, that is UP Jal Nigam and Kanpur Jal Sansthan (KJS) felt the need for trained plumbers/ fitters to initiate this programme. As no such staff was available with these agencies, it was decided to recruit women from the project area and train them as plumbers/ fitters. The socio-economic unit of the project having already gained the experiences of training women in masonry works,

readily took up the challenge for training women plumbers. Women also took part in construction of sanitary pans under the Low Cost Sanitation (LCS) Programme.

8.7 The study on Jajmau project indicates that not only did the women masons construct good quality latrines, but they also acted as motivators, promoting the community's adoption and proper usage of sanitary latrines. In addition to sanitary latrines, these female groups have also completed the construction of one community centre, one production centre, one nursery and labour quarter at the zonal garage. In general, the practices followed in IDP have proved to be highly beneficial which could be replicated.

8.8 In advocacy or movement-oriented programmes particularly, women are either used as a protection wall to prevent atrocities or are kept at low decision making positions. It is commonly observed that in delivery oriented programmes such as provision of safe water and sanitation, education, and income generation, women's representation is fairly large. In studies of advocacy oriented programmes which do not specifically focus on women, their active involvement is not significantly observed due to the very nature of its direct confrontation with the state power. However, certain elements of women's participation in the advocacy process can be noticed.

8.9 In case of Clean Ganga Campaign in Varanasi, the core team at the Sankat Mochan Foundation, the organisation responsible for the campaign is dominated by men. In this campaign, an old lady and freedom fighter of the city provided leadership to the women's wing of the movement. However, various girls' schools were involved with the campaign and girl students of these schools became aware of various environmental issues. These girls in turn performed various cultural programmes, namely dance, painting, creative writing on the Clean Ganga Campaign for educating people on urban waste management issues, growing pollution in Ganga and its impact on the city environment.

8.10 In Save Shahpura Lake campaign in Bhopal the leadership was with the male youth under the guidance of senior male citizens of the city. However, when the campaign started demonstration at the lake and involved school children for removing unwieldy growing hyacinth in the pond, a lady school teacher took leadership in mobilising children from her own school as well as from the other schools. The then Chief Secretary, who was a woman, also provided full support for the cause and facilitated formation of a coordination committee to improve the surroundings of the lake.

8.11 In Mudiya Fishermen's Cooperative Society of Calcutta also the movement was visualised for the families of the fishermen rather than the fishermen alone. Therefore, women also participated in the process. The society has about 14 women members out of 250 members. Apart from helping in the maintenance of the Nature Park and taking care of the plantations, some of them are also involved in poultry farming

and in maintaining the daily accounts. In NGOs like PUBLIC in Calcutta and other organisations supporting protection of wetlands, a considerable number of women of various professions participated in the advocacy process.

8.12 Women's associations have helped significantly in cost recovery process of the public authorities by opening centres for collection of charges. CIDCO collects dues such as water consumption charges, hire-purchase instalments and municipal service charges, from the public. Every year, a large amount of charges are collected under various heads. Majority of these are collected through dispersed collection centres formal as well as informal such as the Mahila Mandals (Women's Association). The method of collection has improved the collection rates as these organisations can keep their collection centres open before and after the regular working hours of the days. The informal approach to collection of dues has also helped in better recovery. The Associations are allowed to retain a certain percentage of the collection charges towards meeting their expenses.

8.13 Involvement of women in hazardous jobs such as electroplating operations is rather negligible. Production process demands experienced labourers on a regular basis, since most of these units operate on day-to-day job order basis. Therefore men are preferred in the electroplating sector. If at all employed, women are associated with lighter jobs and are offered less remuneration.

8.14 As far as occupational health risks are concerned, men are more exposed in these sectors than women. However, with regard to general pollution such as ground water pollution, bio-accumulation through contaminated food, and so on women are equally vulnerable as men. Besides these efforts, women's reproductive health is also susceptible. An unborn baby can contract the ailments if the mother's health is affected by heavy metal contamination.

8.15 The wetlands of Calcutta, which provide natural water purifier through sewage-treated fisheries, also generate employment under three economic activities, namely sewage-treated fisheries, sewage farming and garbage farming. However, in all these activities, the census figures (1991) show that female workers as percentage of male workers are 8.46, 7.86 and 4.64 respectively. They are generally associated with tertiary sector activities such as marketing of products in the economic activities mentioned above.

8.16 East Calcutta wetlands is dominated by women from the economically weaker sections who have their own share of misery. In terms of indicators of development, they are on the bottom rung of the development ladder. With poor literacy rate, poor labour-force participation rate, poorly paid jobs, poor quality of nutrition and low level of knowledge, attitude and practice (KAP) in family planning, they just drag on the existence and do not participate in any organisational effort. However, a change in attitude is noticed among the younger

age-group (26-36 years) who are actively taking interest in community-based organisations despite all these bottlenecks.

8.17 The NGOs carrying out developmental programmes of the government try to associate the schemes with needs specific to women. Sulabh International, while implementing Low Cost Sanitation (LCS) scheme, consulted women in deciding the location of toilets. They were made fully aware and even appreciated the harmful effects of unhygienic sanitary habits such as the use of dry latrines on health and environment grounds.

8.18 When they were asked whether privacy and security of women was maintained in the community complex, they reported that there was no problem about security because there were women attendants in the complex. However, there existed a problem of privacy. The main finding relating to gender issues reveals that there is lack of awareness and motivation amongst the women, particularly in slum areas as to how the effective use of household toilets and community toilets complexes could keep them and their family healthy to improve the quality of their life. Women's active participation in LCS programme is vital because the hygiene and sanitation of the entire family depends upon their awareness and motivation.

8.19 In Slum Networking many of the community development interventions are focused on women and girls, who will in turn be tomorrow's mothers. The reason for doing so is to stem the carry-over of the disadvantages from one generation to another. For example, there is a clear correlation between female literacy rate and an array of other indicators such as infant mortality rate, birth rate, educational levels of children and family incomes. Thus, activities such as mother and child care, female literacy, income generation, vocational training and legal literacy assume special importance in Slum Networking.

8.20 Many of the above activities are specially designed to empower women to control their destinies. There are special programmes for legal education of women. Information is provided regarding the legislations related to marriage, divorce, property rights, inheritance and dowry and also teaches the women to effectively use the complaints and redressal systems. The income generation programmes encourage the women to formalise their cottage industries into registered cooperative societies, make value addition to their products, develop marketing outlets and establish linkages with formal sector financial institutions. Further, the right to majority representation of women, both in terms of the numbers and also the key positions held, is enshrined in all the projects. In Indore, the majority of members in all the 79 Basti Vikas Mandals are women. They also predominantly hold the positions of chairpersons, secretaries and treasurers.

8.21 On the physical front, women in slums face the worst hardships of environmental and sanitation degradations. Sometimes hours have to be spent just to fetch enough water for the day. Often girls miss school to help with the daily

chores of cleaning the house and its insanitary environs. Women are, therefore, highly motivated to initiate development and play a more mature role in reaching consensus and resolving differences which arise in the community. They also show a greater degree of responsibility in managing money and making repayments. The Baroda project came into fruition in spite of a long incubation period of three years simply because of the

persistence of the women there to have individual water taps and toilets. In Indore, as a result of Indore Habitat Project, slum women now prefer to marry in areas which have underground sewerage and individual toilets. This in turn has triggered a social change which will have long term repercussions.

9. LESSONS AND EXPERIENCES

9.1 Based on the analysis, some major lessons and experiences for urban environmental management can be drawn as given below:

(1) The role of cities in urban environmental management would depend on the legal and institutional framework, resources and management capacity

9.2 The 74th Constitution Amendment Act (CAA), 1992 has paved the way to give concrete shape to vest power in the hands of the people at the grass roots level. The provisions of the above Act ensure efficient, transparent and accountable local governments for local level planning, development and management.

9.3 The 74th CAA has a wide ranging impact on effective decentralization at the local level which includes:

- (i) The political power shall vest with people's representatives.
- (ii) The subject matter of urban forestry, protection of the environment and promotion of ecological aspects has been included among the municipal functions. This will result in environmentally sustainable planning and development of settlements and urban environmental management with due understanding of the linkages among infrastructure, productivity, poverty and environmental health.
- (iii) The inclusion of atleast one-third of the total number of seats of women representatives in the local body will help creating suitable platform in the local bodies to take up gender issues. Through this initiative women have been provided with their rightful role in the development process.
- (iv) Election procedures ensure that for all times, people's representatives would be at the helm of civic affairs and no duly elected local government would be superseded for any period exceeding six months.
- (v) The fiscal autonomy associated with more political power for the local body will help the local bodies towards playing a more effective role to promote sustainable development. The constitutional amendment will provide the necessary power to the local bodies for effective participation in preparing the Local Agenda 21.

(2) Although economic and social improvements in the human environment are the focus in traditional urban planning approach, the ecological system that provides necessary

natural resource support and waste assimilation to achieve economic and social goals are not equally examined

9.4 Carrying capacity based regional planning approach with an analytical mechanism may help reconciling the varied social expectations in the human environment and the quality and stability of the natural environment. It relies on the emerging thesis that growth and environmental conservation across urban settings are complementary rather than conflicting.

9.5 This in turn will put demands on various supportive and assimilative capacities of the city or a region setting. Such carrying capacity depends on various economic, infrastructural and institutional resources of the setting (supply) as well as waste assimilative capacities of the air, water, land/soil and biological components (demand) of its environment. Carrying capacity based planning is directed towards the management of these supply-demand gaps or the "Carrying Capacity Differential".

9.6 The study includes indicators developed to assess the carrying capacities of various environmental resources in terms of sustaining the quality of life and the needs and demands of population and economic activities for these resources across an urban area. Several indicators developed in the study can be applied to assess the assimilative capacities of air, water, acoustic, land and biological resources of the entire region.

(3) The issues pertinent in the urban environmental context are gradually being raised by a cross section of civil society, however, the advocacy efforts to highlight such issues are still in their nascent stage

9.7 The majority of experiences which have used some degree of advocacy revolve around solid waste management, environmental pollution, forest/green cover degradation in cities and human settlement issues. The people's groups and citizen's councils are becoming more organized to identify issues of concern and build strategy for advocating on such issues at various levels of power centre. The focus is on laying more emphasis on building organized efforts around institutions, NGOs and structured secretariat for advocacy.

9.8 The major achievement of Clean Ganga Campaign at Varanasi can be stated in terms of raising an issue through advocacy which culminated into a national level programme known as 'Ganga Action Plan'. In Save Shahpura Lake, Bhopal, the campaign could bring about significant changes in the improvement of the quality of water of the lake. The co-ordination committee which was setup specifically for the Shahpura Lake developed a joint action programme involving various departments and NGOs. The Mudialy Fishermen's Co-operative is an unique example of livelihood creation out of recycled water. The wetlands at Calcutta produce large quantities of fish, vegetables and forest products. The public interest litigation suit filed to protect the wetlands by prohibiting any further construction on the wetlands was decided in favour of the issue.

(4) Low cost sanitation measures can create long term impact in improving urban sanitation situation and health status of the people living in urban areas

9.9 The low cost sanitation technology developed by an NGO (Sulabh International Social Service Organization) has contributed in the movement of liberation, training and rehabilitation of scavengers through low cost sanitation technological innovations. The system of pour-flush water seal sanitary latrines or household toilets are now accepted systems. This effort has been supplemented by community toilet complexes in public places and also in slum communities. The Indian experience of partnership approach by local bodies with NGOs in low cost sanitation measures to tackle urban environmental problems has provided affordable solution to the sanitation problem facing the urban settlements.

(5) Partnerships linking NGOs, community groups, waste pickers, private sector and municipal corporations are emerging as one of the most effective means of addressing the problems of solid waste management

9.10 The inability of the local government to collect and dispose city refuse resulted in various options initiated at the instance of citizens, NGOs and local bodies. The innovative practices in collection, transportation, neighbourhood disposal, and awareness about waste segregation and resource recovery have clearly demonstrated that solid waste management is not constrained by lack of morals, approaches, technologies and systems, but requires a determined effort by the local authorities to mobilise all actors in concerted efforts for change.

9.11 Promotion of a culture for solid waste management, right from the individual to family to community is essential, and for achieving this, education, extension services and involving women in particular, is important. Success of management depends exclusively on clear allocation of responsibilities between various stakeholders. Monitoring systems will need to be developed for measuring the effectiveness and sustainability of solid waste related activities and the performance of the local authorities therein.

(6) Technical solutions should not be looked at in isolation of actors concerned with its implementation. A project aiming for a nexus between technology, institutions and community can lead to sustainability

9.12 The main lessons learnt from the IDP project could be elaborated under the following heads:

Preventive Measures

These included improving the production process of the industrial units through resource recovery, providing sanitation facilities to the residents and improving the work and living environment in the project area. The approach primarily looked at the source of pollution generation and suggested remedies to reduce the same at source.

Curative Measures

The technical interventions suggested collection, removal of waste, envisaged linkages with the social, economic and institutional dimensions. The project was therefore, implemented adopting an integrated approach giving due importance and assurance to the participation of institutions, actors and community, with special attention to the role of women.

Therefore, environmental projects should not just concentrate on 'end of the pipe' treatment approach but at the same time also on mechanisms of reducing pollution at source. Sectoral approach to solve environmental problems have not succeeded, the IDP project demonstrates that an integrated approach can have sustainable impact.

(7) Dissemination of Waste Minimisation and Pollution Prevention Measures among small scale industries need a careful planning and systematic approach

9.13 Waste minimisation and pollution prevention practices are well understood and demonstrated for electroplating sector under the pioneering efforts of National Productivity Council. These measures have suggested source reduction measures so as to minimise waste, resource recovery from effluents and small housekeeping measures for increasing productivity.

9.14 The feedback about these measures is not very encouraging as entrepreneurs do not appreciate the significance of their contribution in pollution prevention under the misconception that their share is very small. The know-how about technical and financial performance of new techniques is low and legal regulatory instruments do not give any extra incentive for a less polluting unit when compared with a highly polluting unit. The price structure is also such that recovery of chemicals become more expensive compared to buying them fresh.

9.15 With the increasing emphasis on Total Quality Management (TQM) and stringent specifications for export oriented products, industries are slowly coming forward to adopt these measures.

(8) Folk technologies operate on a much broader canvas having multi-dimensional linkages that contain employment and economy as primary components and pollution control as tertiary

9.16 The East Calcutta Wetlands demonstrate a sustained natural resources development based on the principles of ecology, energy conservation, economics and employment generation. Moreover, the drainage and garbage disposal system of Calcutta city has a direct linkage with the existence of this wetlands area.

9.17 A cost benefit analysis has clearly projected that replacement of wetlands sewage treatment plant is a very expensive proposition in terms of capital cost alone without taking into account its socio-economic and environmental

linkages. Any further step to urbanise wetlands will cause a breakdown in the existing system of sanitation causing regular water logging and garbage disposal problems in Calcutta metropolis. This may also affect the economic benefits obtained from wetlands due to production of fish and vegetables which also in turn generate employment for about 30,000 urban poor. The ecological damage to the city is irreparable if conservation is dominated by conversion.

(9) New Town Development could guide environmental practices and management techniques

9.18 Development of Navi Mumbai (New Bombay) by City and Industrial Development Corporation (CIDCO) owning the entire land, has facilitated planning of this city in an environmentally friendly manner. Adequate planning for and provision of supporting infrastructure facilitated the shifting of market activities from Mumbai (Bombay). Planning aspects also looked into planning of market areas and informal shopping, mass rapid commuter rail network, integrating commercial spaces with rail nodes and preservation of environmentally sensitive zones.

9.19 Besides land reclamation, CIDCO has adopted a package of infrastructure measures (solid waste management, storm water drainage, sewerage and water supply) and a greening programme. The potential threats by squatters who may start invading hill slopes, lands below tension lines and undeveloped coastal lands have been resolved by greening these areas, establishment of public recreational spaces and providing housing for EWS category.

9.20 The issues remaining unresolved are due to multiple agencies responsible for the Thane-Belapur Industrial Area and Chembur Industrial Area. Coordinated environmental management effort will need to involve CIDCO, NMMC and MIDC for this purpose.

(10) Dynamics of slums should be built into city development process. This will call for interactive action plans with slum dwellers assuming the role of development partners

9.21 Large scale development projects cannot be sustained by grants but each city has to rely on its intrinsic strength for progress. Further, since bilateral grants are channeled through public agencies, the project is eventually delivered by the agency, and not executed by the community. Slum networking in combination with progressive models of community participation and community management is an innovative approach to slum improvement.

9.22 Slum Improvement projects use slums as an organisational framework and demand that the community assume responsibilities and commitments. Experiences have shown that under the right conditions, the slum dwellers have invested large sums in their housing and related activities. The huge resources commanded by private sector could also be utilised in guiding the improvement programmes.

9.23 To make this concept replicable, the pre-conditions are:

- a workable physical concept which is economic, sensitive to the community, practical and transcends from micro to macro scale
- resources have to be mobilised and
- the community has to have control over development

MAJOR CONSTRAINTS

9.24 The major constraints identified in the scaling and replication of best practices are as follows:

1) The present budgetary constraints and the inability of local bodies to generate internal resources do not allow demand for services to be met by local bodies. From the available experiences of various actors of urban management, the following weaknesses contribute to the present state of affairs:

- Mismatch between institutional capacities and responsibilities.
- Lack of adoption of commercial/semi-commercial policy and practices
- Rigid and inward looking institutions
- State monopoly in the urban services sector and scarcity of resources

(2) Vertical and Horizontal Fragmentation

9.25 Urban environmental problems such as air pollution, water pollution, lack of green spaces, and so on, are not just "local" but have cross-border impacts. Environmental management plans are not effective largely due to the vertical and horizontal fragmentation of agencies and institutions involved in pollution abatement. Vertical fragmentation arises when various tiers of governments intervene in urban areas by virtue of their statutory powers. In most instances, these agencies do not coordinate their policies at local level. Horizontal fragmentation occurs when many units of local government operate in distinct sectors without coordination. In India, a large number of parastatal agencies, such as Urban Development Authorities, Water Supply and Sewerage Boards work in municipal areas, often in conflict or competition with one another.

(3) Advocacy is often taken as anti-government instead of a tool to analyse the effectiveness of policies at the city scale

- Lack of knowledge with NGOs about advocacy, management and building systems to utilise the data base and knowledge for more powerful advocacy operation.
- Weakness in present capabilities to oversee through political consequences of development and lack of knowledge and skills to highlight policy level issues at the appropriate level of power centres.

- Weak systems and or data base which would influence NGOs to play advocacy roles more effectively as most of the rich experience remains unutilised for strengthening their position or for its sharing with the other likeminded groups in a strategic networking relationship.
- Unawareness about waste minimisation and pollution prevention measures, consequences of producing and spilling wastes leads to its unorganised disposal.

(4) Local Bodies do not have a work schedule and often lack in manpower and managerial planning. The work is taken on adhoc basis and the resources are invested mostly under political pressures instead of rationale planning and priority setting

- Institutional development should start at a early stage of project implementation.
- Absence of a consistent and detailed policy statement/ document on Solid Waste Management related to the future growth of the city and generation of solid waste.
- Selection of technologies is often not done according to the local conditions, investment capabilities and infrastructure availability.
- The implementing agencies lack socio-economic units, O&M departments and training facilities.
- Performance standards are not specified for reporting and communication.
- There is a linkage between standards adopted and the affordability. When solutions do not match the paying capacity effectively there is a need for subsidisation. This may work on an individual project but cannot be replicated on a large scale.

(5) Although there are many laws and legislations on environmental protection, but due to lack of the enforcement agencies and proper monitoring they are often non-implementable

- No statutory authority has been created for wetlands with a legal framework to oversee their protection,

conservation and management and to take appropriate penal measures for the violation of laws and regulations.

- Delay in land acquisition, dispute about compensation and social cost of acquisition often hampers developmental projects.
- Inadequate enforcement of environmental laws, regulations and standards
- Lack of effective partnership arrangements between local governments and NGOs and community.

CONCLUSIONS

9.26 Experience of several practices in urban management bring certain points into focus -

1. Public institutions have a major role to play in shaping urban environment.
2. They must be backed by proper legislative support.
3. Tax-structure of the local bodies should be flexible enough to provide economic incentives as well as strengthen the economic base of the local bodies.
4. Decentralization of governance from the national level to the local level helps to associate the stakeholder in the management process. It is also an important element in the organization of other institutions such as the NGOs.
5. Institutional structure should be flexible enough to accommodate area specific characteristics.
6. Partnership among the government, private sector, NGOs and direct beneficiaries helps to sustain any development efforts.
7. Research mobilization effort for developmental project should be largely based on local sources, wherever possible.

10. SCALING UP AND REPLICATION

10.1 The research studies have analysed and focused on critical factors for scaling up and replication of experiences. The research findings present the characteristics of best practices across the ten case studies, providing the factors towards their scaling up and replication. It is realised that several pre-requisites would be necessary for their scaling up and replication.

10.2 The following issues have emerged from the research studies:

- Democratic Decentralisation for empowering people in decision making
- Empowering women in decision making, access to employment, education and health services
- Environmental improvement through community involvement in low income areas
- Self-help sanitation
- Sustainable urban development
- Involving people in urban environmental management
- Environmental awareness
- Institutional capacity building
- Partnership

10.3 In the study *"Power to the People: The Local Government Context"* the Indian initiative in democratic decentralisation, through the 74th Constitutional reforms attempts to make the urban local bodies meaningful instruments of urban environmental management. The reforms are not limited to transfer of political power but also provides for an efficient mechanism that ensures proper implementation through building organisational and fiscal capabilities of the municipalities. The State Governments have already amended the laws, formed the Election and Finance Commissions. Elections to many local bodies have already been held. These reforms are indicators towards wide replication of the best practice in terms of legislative reforms at the national, state and local levels, institutional reforms, and training and human resource development with a view to meet the new challenges.

10.4 In the study *"Carrying Capacity Based Regional Planning"*, the Seventy-fourth Amendment of the Indian Constitution and Local Agenda 21 once again emphasise the importance of community development in the planning process for local area development. The Constitution reforms envisage "grassroot" level planning, and to give to the sustainable development concept a political sanction at all levels of administration and development. The study also highlights that under the current

economic reforms policy, urban settlements in India are likely to undergo greater stress than ever before because of rapid industrialisation. Therefore, policies and action programmes to upgrade the supportive and the assimilative capacities are of immediate necessity, especially focusing on pollution prevention and infrastructure provision.

10.5 This could be facilitated by the policy changes evolved through Local Agenda 21 supported by the 73rd and the 74th Amendments of the Indian Constitution. The study provides a methodology to assess the carrying capacity of environmental resources to sustain the quality of life, the two components being assimilative and supportive capacity.

10.6 The study on *"NGOs/Civic Societies and Urban Environmental Advocacy"* through an analysis of three experiences has demonstrated some elements of sustainability and scaling up. These Best Practices focus on raising public opinion, attracting administrative attention and getting political support for various causes including environmental protection and management and thus wider replicability. These practices also indicate that an advocacy campaign initiated at local level can be forceful and end up in a national programme (Ganga Action Plan). The potential of people's action through advocacy in urban environmental management, initiated by NGOs and CBOs is very high and can be effectively replicated for issues which could be of local, regional or national importance.

10.7 The study on *"Integrated Low Cost Sanitation : Indian Experiences"* indicates that low-cost sanitation technology, particularly for low income groups, has a high potential for replicability. The three crucial characteristics contributing to replicability and scaling up are: simple construction and environmentally sound and low-cost technology. At the same time, it is clear that direct participation of women in a big way and also of NGOs have significantly enhanced the replicability of the practice by creating the demand for change from within the community.

10.8 The experiences through the study on *"City-wide Best Practices in Solid Waste Management in Collection, Transportation and Disposal"* show a great potential for replicability. However in scaling-up and wider replication of the practices, special attention needs to be paid to:

- a) Facilitating and supporting the involvement of NGOs and CBOs, establishing a smooth link between their activities and secondary collection and disposal activities by the local government.
- b) Effective decentralisation of the collection and disposal responsibilities. The disposal processes should be tried in combination and if necessary, research on vermiculture process promoted to make it applicable on scaled-up operations.

- c) Acknowledgement of the important role of informal sector in segregation of waste and recovery and integrating them into improved solid waste management system.

Above all, the first requisite for wider replicability is enhanced awareness of people about their role in generating and segregating garbage and in this task the role of women is important.

10.9 The study on "*Environmental and Health Improvement in Jajmau Area, Kanpur: Lessons and Experiences for Wider Replication*" documents the various components of the project - controlling pollution at the source in the tannery industries, UASB technology for sewage treatment and methods of improvement of the environment of the slum settlements nearby and show ample potential for scaling-up and replicability in similar situations.

10.10 Here again awareness building, direct involvement of women, adoption of simple to implement and low cost technologies have become crucial inputs. The pre-requisites for scaling-up and wider replicability are building-up a sound information and training base through adoption of appropriate training modules; clear allocation of responsibilities among all actors; promotion of direct involvement of women in variety of activities including in those where only men used to be involved earlier; adoption of a commercial or semi-commercial approach to cost recovery as necessary in a given situation; and linking the introduction of clean technologies with legal and fiscal measure to ensure wider adoption of the same.

10.11 The study on "*An approach to pollution prevention in electroplating sector*" shows a promising potential for replicability and scaling-up applications. To achieve this, it is essential to make strategic choices specially related to regulatory mechanisms, training and skill development of the workers through appropriately worked out training modules and demonstration of the cleaner production practices on sustained basis.

10.12 Prevention of pollution at the work place through proven technologies must be accompanied by similar use of technologies in the disposal of the effluent and maintaining the sewage pipelines. Dissemination of the experience to wider audience through the conduct of appropriate seminars, workshops and the use of audio-visual and data bank means can go a long way in disseminating the best practice aspect.

10.13 The study on "*Integrated Study on Wetland Conservation and Urban Growth: A Case of Calcutta's Wetlands*" involves sewage treated fisheries, garbage farming and sewage farming. These practices have become sustainable based on recycling of urban wastes in the spillway basin of the river. The changing aquatic environment in the wetlands had been intimately linked with the sewage of the city of Calcutta draining through these wetlands. The best practice has shown that the experiences of Calcutta of open air water purification could

be easily replicated in the cities with low lying water-logged fringes. It is true that cities in general grow on raised lands and occasionally there are some low-lying water-logged areas around the city. Calcutta, Bombay, Dhaka, Jakarta and Bangkok are among the few cities with marshy backyards. The Calcutta wetlands practice has grown into an advanced knowledge base and the widely-shared perception is that waste water is a nutrient pool for the cultivation of food (vegetables, fish) rather than a pollutant.

In many developed countries such open air water purification has been used until very recently; the technological requirements are minimal and the system is very cost-efficient.

10.14 The study on "*Sustainable Urban Development - Case Study of Navi Mumbai (New Bombay)*" documents the experience of New Bombay in integrated development through public-private partnerships which has been able to create a new form of sustainable environment. The New Bombay experiment has started yielding the fruits of planned interventions not only in the new city scenario but also in the regional context in which it was envisaged as a counter-magnet to arrest migration to Greater Bombay and also to decongest Bombay. The success of the implementation so far has also demonstrated that by caring for citizens and using innovative methods, the city management can serve commercial objectives based on market forces and, at the same time, achieve social goals. Innovative approaches involving a large number of small firms for the maintenance of key urban services/amenities are other approaches worth replicating.

10.15 The study on "*Slum Networking - A Community Based Sanitation and Environmental Improvement Approach: Experiences of Indore, Baroda and Ahmedabad*" demonstrates that the innovative practice has made a tangible impact in improving the quality of life of a large section of population living in slums of Indore. The practice has replicability potential in (a) upgrading the entire slum matrices in various cities within a finite time-frame; and (b) revitalising the service infrastructure and environment of the urban areas as a whole. The project shows that the slum fabric can be used effectively to transcend from the community scale to the city level. Indeed, the transitions from Indore to Baroda and then to Ahmedabad have taken comparatively shorter time, inspite of the fact that the degree of community control has been increased from one experience to another.

10.16 Slum dwellers have consistently demonstrated their keen desire to change their living conditions, by mobilising resources for meeting their needs particularly in terms of water supply and toilets. In the slum-networking concept, community development interventions focus on women. Such activities include mother and child care, female literacy, income generation and vocational training.

Institutional Capacity

10.17 It was felt that institutions play a vital role in promoting innovative ideas and technologies to a larger audience. It is

therefore important that institutional strength, particularly of the local bodies, should be increased. Depending upon contemporary needs or project compulsions, greater responsibilities have been assigned to local institutions without any corresponding efforts to ensure that these institutions are strengthened to carry out their enhanced tasks by improving their MIS systems, retraining their staff, equipping offices with adequate automation, pursuing rational pricing policy and adopting modern management techniques. This was practically brought out by almost all the ten best practices studied in this document.

10.18 The experience of Ganga Action Plan indicates that institutional development should proceed and then continue the project implementation stage. For synchronisation of project execution, it is important to strengthen coordination through establishing project management groups. The implementing agency should be equipped with socio-economic unit, O&M department and training facility. Performance standards should be streamlined and setup where there are none.

10.19 Instead of dissipating its resources on micro level execution, the local authority must focus its concern on the city level perspective, preparing a game plan for the long-term development of the city and its infrastructure. This involves survey and data collection, distress mapping of the city, prioritisation of needs, preparing proposals, determining resource needs, mobilising finance and preparing a time bound action plan for execution and maintenance. At present no such planning exists in most cities. Instead, resources are spent on ad-hoc basis depending upon the exigencies prevailing at that moment of time.

Financial Implications

10.20 Financial restructuring and project sustainability are complimentary terms. However, cost recovery will have to be linked with the improvement programmes. This requires sufficient awareness among beneficiaries in terms of needs and the repayment capacities of the beneficiaries. Financial strategy for scaling up and replication of the practice would be as follows:

Larger Revenue base for Municipalities

10.21 It has clearly emerged from different studies that financial health of local bodies will need to be improved to make them function efficiently and to decentralise power at local level. With added responsibilities of preparing economic and social plans, managing local environment and preparation of Local Agenda 21, they will need to strengthen their managerial capabilities which in turn will mean that they will have to generate good information base.

10.22 The State Finance Commissions have been constituted to make recommendations about sharing of taxes, tolls and

duties and transfer of grant-in-aid for the local bodies. The logic of the politically popular concept of local autonomy needs to be extended to local fiscal autonomy also, the separation of taxation and resource mobilisation powers should be such that local governments should be able to generate enough resources, both for their recurrent and developmental needs.

10.23 In Ganga Action Plan, beneficiaries were required to bear the capital costs partly and O&M costs fully. Resources being raised through water and sewer taxes were proposed to be improved by increasing the number of tax payers through registering the unauthorised and unregistered users, reducing leakages and efficient billing and collection procedure.

Mobilising Resources from Community

10.24 The studies have clearly demonstrated that communities have the capacity to finance their own upgradation. The case studies prepared by Sulabh International Institute of Technical Research and Training, Himanshu Parikh on Slum Networking, Development Alternatives, Development Associates and Ministry of Environment and Forests has shown that slum dwellers and small scale entrepreneurs do invest large sums in their improvement. The findings have concluded that this propensity to invest is linked with perceived security and faith in the locality for slum dwellers, and with resource recovery and penalty on creating pollution for industrialists.

10.25 For scaling up and replication, the role of these actors should be changed from recipients to that of clients, who have the right to be consulted and the right to demand highest quality of work. The initiatives at community level have indicated that resource generation even from low income community is possible. But it will have to be linked with upgradation or improvement in services and city development.

10.26 The government, however, does have an active role to play at the national level. It can help to set up apex financial institutions to provide working capital to the Saving and Loan Societies and also lend to intermediate private sector organisations such as SEWA Bank and Housing Development Finance Corporation (HDFC) for the same purpose.

10.27 The community groups set up in slums could be used to make collections on house-to-house basis so that financing institutions are relieved of their responsibility.

Partnership Approach

10.28 The success of partnership approach has clarified that this is perhaps the answer for effective delivery of services by municipalities which are faced with managerial and financial crises. Municipalities will have to increase their capabilities and play the role of a monitoring agency. Local bodies will hence choose to keep themselves away from micro level execution and focus on preparing city development plans and policies instead.

Public Private Partnership

10.29 The entry of private entrepreneurs should be carefully selected as this will require monitoring and capacity building of local institutions. The experiences of solid waste management and CIDCO define few areas where the partnership has been successfully tried. Scaling up will mean improving organisational inefficiencies, and modifying laws and legislations to facilitate their entry. The agency will also need to plan for break down services when they will be needed to perform the function. This is possible in the case of solid waste management, where withdrawal of services of transportation of waste may cause havoc in the city if not supplemented by a formal back up facility.

Public-Public Partnerships

10.30 The success cases of this partnership illustrated in the studies include setting up of community representatives, discussing developmental options, resource mobilisation, eliciting participation during execution and subsequent maintenance.

10.31 The scaling up and replication would require strengthening civil society especially NGOs to be aware of true political consequences of development and build knowledge and skills to highlight such policy level issues at the appropriate level of policy centres. It has also proved that weak systems and poor database influence the performance of NGOs/CBOs as most of the rich experience remains unutilised for strengthening their position. This implies the need for perspective planning at the level of governmental agencies to work out modalities on relevance and effectiveness of their involvement in advocacy developmental projects.

Institutional Networking

10.32 Strengthening a few NGOs and other institutions in networking relationship could effectively fill the gap of skill development, data base generation and management and in assigning of roles and responsibilities for their operation. A networking model called "Swabhimana" has been attempted by Bangalore City Corporation. This is a platform that calls for various governmental agencies and NGOs working in the area of city development for sharing, discussing and assigning roles to each of them.

10.33 Such initiatives will need good networking with government playing the role of a policy planning and facilitating agency. However, assigning roles to NGOs/CBOs in city development process will need building up of capacities of these agencies and this has been strongly emphasised in the case studies.

Gender Aspects

10.34 The potential of women in motivating the community, awareness creation and involvement have been successfully

tried in different proportions in most of the case studies. The low cost sanitation and Ganga Action Plan have been very successfully used this potential for sustainability of their project.

10.35 As a general agreement one can now conclude that women can play a very important role in public participation, awareness building and motivating the community. They should therefore be involved in projects from the inception stage for developing the software component of the projects. Other possible areas would be to involve them in home-based economic activities, resource mobilisation through credit and thrift societies, maintenance of community assets and community participation in planning. The Ganga Action Plan implemented in Kanpur has also recognised that women trained as masons and fibre reinforced plastic (FRP) pan producers for pour-flush latrines have also worked satisfactorily. This is a new dimension to their involvement taking into account the perceived need of maintenance of assets created during the project period in particular.

10.36 All the above activities will in turn need effective capacity building strategies of different women's groups for different purposes of involvement. The likely reward would be sustainability of the project and better utilisation of the assets.

THE BROADER ISSUES

10.37 The preconditions identified for scaling up and wider replication could be summarised as follows:

1. Urban environmental quality at the city level depends on the municipal management capacity.
2. Local institutions will have to play the role of a facilitator mainly concentrating on policy planning and local environmental and development plan preparations for long term development. The role of implementation at micro-level may be given to other parties such as private agencies or NGOs.
3. Capacity building of all agencies and institutions is a pre-requisite for urban management tasks. Training and skill development will vary according to the type of organisations whether NGO/CBOs/Private Sector, type of activities it is going to take up, and scale of the activities.
4. The added responsibilities envisaged under municipal reforms entail that financial base of the municipalities need to be widened. This seems possible in the light of State Finance Commissions working for fiscal restructuring of state-municipality relationship.
5. Encouraging partnerships shall bring efficiency in the services. Capital intensive projects will call for private

partners in implementation while operation and management of services, which requires community support at large, could be entrusted to NGOs/CBOs.

6. Municipalities will need to increase revenue generation by bringing into the revenue net the unauthorised or illegal use of services. In addition, mobilisation of community - based resources for incremental development could also make the development financially viable.
7. Governmental agencies should preferably set up a platform to facilitate interaction among different actors for preparation of city management plans and also

assigning them roles in urban environmental management.

8. Women need to be given specific role of awareness, community motivation, running community saving and loan schemes, routine maintenance, home based economic activities and advocacy.
9. Enhanced public awareness, consultation and participation can improve environmental management.
10. Urban environmental management strategies should focus on the problems of the poor more explicitly.

11. CAPACITY BUILDING FOR URBAN ENVIRONMENTAL MANAGEMENT

Capacity Building - Concept

11.1 Urban environment is in constant flux and provides new challenges. Therefore, capacity building at local level to manage environment has to be a continuous effort.

11.2 Capacity building for urban environmental management means strengthening and improving management in terms of building technical, financial and managerial capabilities; upgrading institutional and technical capacities of the key actors to help identify, understand and evaluate complex urban environmental problems; establishing cooperative partnerships to deal with the environmental degradation; and improving human resource development by upgrading skills through training.

11.3 Capacity building is a long term continuous process which should include requirements at various levels. Capacity building depends on two inter-related factors: (i) Strengthening of institutions at all levels; (ii) Development of human resources at all levels including training.

11.4 Capacity building activities need to be initiated and supported by national, state and local governments.

Capacity Building at Local Level

11.5 The level of government most directly responsible for providing environmental infrastructure and services is the local level. The ability of local governments to fulfil this responsibility, however, is limited. The capacities most critical to the success of environmental management at local level would therefore include adequate institutional arrangements and organisational structures, trained professional and support staff, adequate facilities and equipment, and resources.

11.6 The urban local bodies will be required to improve and strengthen their governance, but they lack capacity, skills and legal basis. The measures that have to be taken to strengthen governance depends on:

- the requisite legal status so that their authority is recognised.
- clear mandate of the responsibilities between different levels of government and local bodies.
- buoyant sources of revenue.
- skill upgradation to strengthen their technical, financial and management capabilities.

Their roles at the same time are becoming more complex and wide-ranging in response to new approaches in service provision,

public-private partnerships, public participation in decision making, collaboration with NGOs, and environmental and urban poverty concerns.

11.7 Capacity building efforts should, therefore, focus on upgrading the local technical, financial and management capabilities. This would also establish cooperative partnerships for dealing with environmental degradation that urban areas face. There is a need for a strong coordinating mechanism, involving all actors with a pivotal role for local authorities. Similarly, ensuring effective enforcement capacity, and strengthening human and technical capacity as well as increasing financial resources are crucial to the success of any urban environmental strategy affecting urban environmental quality.

11.8 The research findings recognise the respective roles of various actors, including different governments, different local governments, NGOs/CBOs as better suited to meet the challenges of urban environmental management problems. The studies conclude that the legal and institutional structures of local governments be strengthened and local authorities get access to adequate trained personnel and financial resources.

Actors for Capacity Building

11.9 The task of capacity building for urban environmental management cuts across sectors, institutions and actors. The three groups of actors that have a significant influence on environmental problems are:

1. Public Sector

It comprises of departments, agencies and authorities at the central, state and local levels mainly engaged in developing regulations, legislations and policies.

Capacity building at this level should look into the existing environmental policies and how policy instruments could be used to combat air, water and land pollution. The main issues concerning these agencies will be:

- * reviewing and establishing pollution standards and instruments for monitoring;
- * establishing the enforcing institutions with clear mandate and responsibilities;
- * networking and inter-institutional coordination for information exchange, consultation and administrative concerns.

2. NGOs and CBOs

NGOs, CBOs and other local interest groups need to be encouraged to bring awareness in the community about participation in environmental planning, monitoring and decision making. Capacity building for these actors should focus on public awareness, advocacy, local leadership building, and organising and mobilising public participation.

3. Private Sector

Both the formal and informal private sector will need to undertake intensive research to develop the concerned pollution control technologies or aspects of environmental management for wider dissemination. Industries will need to comply with environmental standards and therefore pollution control technology and service delivery will have to be resource efficient.

In addition, housing and land development will need to focus on resource based and energy efficient planning. Informal sector activities should be organised in a meaningful way with formal operations specially in waste recycling for solid waste management.

Tools for Capacity Building

11.10 In order to build the capacity for effective environmental management, several capacity building tools need be developed and used including the following:

Institutional Development and Regulatory Mechanisms

Institutions concerned with local environmental management will need to build their skills in various categories as mentioned below:

- Technical: Type and causes of pollution, availability of pollution prevention measures, planning and implementation, operation and maintenance.
- Finance: Fiscal instruments available for pollution abatement, resource structure and existing tax policy, pricing and cost recovery.
- Management: Existing policy framework, institutions and functional coordination, generating an information base, training and skill development.
- Regulation: Laws, regulations and codes, Amendments, policy changes

A major problem to be tackled in urban environmental management is the weakness of institutions in terms of technical capability, financial viability, managerial capability and regulatory functions. This calls for support in strengthening the institutions and the development of national capacities to plan, implement, regulate and sustain the measures of pollution abatement with institutional mechanisms appropriate for broader perspective of urban environmental management tasks.

Human Resource Development through Training

The 74th Constitution Amendment Act envisages substantial additional responsibilities on municipalities of various sizes.

This would require redefining the organisational objectives in relation to the new demands, meeting the challenges of management, and relate the same to the external environment and skill capability of the personnel on different jobs. This would require drawing up a training plan to meet the needs as a part of institutional capacity building and human resource development.

Meeting Urban Local Bodies Training Needs - National and Regional Efforts

Municipal training was first initiated in India by All India Institute of Local Self Government (AIILSG), Bombay for municipal staff during the pre-independence period. A Centre for Urban Studies (earlier known as Centre for Training and Research), in IIPA was set up in 1966. This was followed by establishment of other regional centres -AIILSG for western region, the Indian Institute of Social Welfare for Business Management in Calcutta for eastern region, Lucknow University for the Central and North India in 1968, and Osmania University, Hyderabad for the Southern region in 1970. The Calcutta centre was closed in 1982. These centres were renamed later as Regional Centres for Urban and Environmental Studies.

The IIPA centre organises courses on urban planning, urban law, impact of economic reforms and 74th Amendment, Poverty Alleviation, Slum Improvement and Environmental Management and trains over 200 senior and middle level participants annually from various urban authorities, with the majority from non-municipal bodies. The three regional centres organise courses focussing on local needs as well as UBSP activities.

National Level Institutions

HSMI of HUDCO, set up in 1985, undertakes training in various aspects of Human Settlements Development. HSMI was set up as a wing of HUDCO to support the implementation of HUDCO's lending operations, by training HUDCO functionaries, and the borrowing agencies. It is estimated to have trained over 3,500 professionals from different functional agencies including municipalities. It has taken up decentralised training programmes in collaboration with local training institutions such as the ATI, Mysore and RIPA, Jaipur and MHADA, Pune. HSMI has collaborated with IHS, Rotterdam for the the Netherlands Government supported Indian Human Settlement Programme (IHSP).

The Institute of Urban Affairs established in 1976 conducts training courses for urban managers and recent programmes in selected cities under USAID assisted FIRE programme. It is also involved in supervising the training component of UBSP NIUA also undertakes research and consultancy assignments.

The Town and Country Planning Organisations of the MUAE assists MUAE in the exercise for the assessment of training needs and jointly organises courses for management of urban development in collaboration with the Development Assistance

Group in Birmingham once a year for urban professionals.

State Level Efforts

West Bengal established a Institute of Local Government Studies in Calcutta for the municipal and urban personnel of West Bengal. The Centre for Urban Environmental Studies in Trivandrum and the Institute of Local Administration in Trichur in Kerala and the Municipal Training Centre in Coimbatore in Tamil Nadu, have been set up for training elected municipal authorities, municipal officials and functionaries under the UBSP. Apart from these specific training institutions organisations such as MMDA, CMDA and Bombay Municipal Corporation have in-house training cells for training personnel in the World Bank assisted projects and other activities.

The State level training institutions undertake training programmes for various functionaries of government agencies and departments for urban institutional personnel with the help of outside faculty. These include the UP Academy of Administration at Nainital, the Administrative Training Institute of Karnataka at Mysore, the Rajasthan Institute of Public Administration at Jaipur, the Maharashtra Institute of Development Administration in Pune and MP Association of Development Authorities. The Association of Metropolitan Development Authorities has started running courses tailored for the personnel in these authorities.

Training through Academic Institutions

The School of Planning and Architecture in Delhi and several other departments in a number of Universities award graduate and post-graduate degree and diplomas in planning and architecture. Besides, the School of Planning through its various Centres of Studies organises specific training courses for in-service professionals including urban environmental management. There has also been involvement of the four Indian Institutes of Technology and Institutes of Management and some Universities with certain aspects of urban development and infrastructure.

The training requirements for urban local bodies personnel would thus need to be organised within the available institutions and courses introduced in the context of urban environmental management, supplemented by a plan of human resource development.

Training Needs

Capacity building entails development of institutions and individuals. The wider dimension of capacity building has to be understood in the context of the 74th amendment, and the policy thrust for involving the representatives directly in the tasks of municipal management.

The training needs of the local bodies should, therefore, cover several subjects including urban environmental management

and control, community support and citizen involvement, urban planning, urban and municipal finance, urban poverty alleviation, communication skills and inter-sectoral training. The design and evaluation of training courses would need to be drawn up in conformity with the objectives of municipal organisational development.

Identification and analysis of the training needs should indicate the requirements covering:

- training subject areas (as per specific needs of different cities and role of organizations)
- training target groups (State or city level agencies, functional agencies, NGOs, political leaders)
- training modes (in-class or on-the job training, integrated or decentralized long or short term, etc.)
- timing of training (as per prioritization of different training needs)

The ten best practices have provided a detailed prescription of the training areas, target groups and training modes on different aspects of urban environmental management.

Approach to Training Strategy

Decentralised training, and networking with state level institutions is emerging as one of the thrust areas in HSMI's future charter. The pre-occupation of national and state level training institutions will be with municipal - functional agency - specific - related training, with limited involvement in the direct provision of municipal training. There is need to use the capacity building concept as a basis for developing the framework within which training and human resource development for municipalities could be developed to support the urban environmental management sector.

Different training techniques and packages may be needed to reach distinct groups. It may be necessary for state governments to initiate the effort for the preparation of the training plan, with the help of training institutions and the full involvement of the municipal and urban agencies.

Public Information Systems

Effective public information systems are needed to promote public participation in environmental management as well as to create incentives for improved environmental services. This will need improving and updating the existing basic data available through research studies to generate more information for analysing and interpreting the output for policy reforms and for improving the regulatory and legislative framework.

The lack of adequate information has been one of the major impediments to urban environmental management. Two types

of problems are encountered in developing public information systems. The first relates to the problems of data availability. Existing data are often not compatible with each other. The second type of problem relates to technological innovations and their adoption by an organisation, having requisite capabilities of technical staff and the extent to which innovations are adopted. It will be necessary to take into account the institutional and human resource problems associated with the use of computerised data managements system. In the process it will be necessary to take into account the organisational and administrative structure of local government in developing an appropriate system.

There is a need for policy-research on information system comprising the following to develop Public-Information System:

- (i) User requirements: Case Studies are needed to develop methodologies for use of data and facilitate data integration.
- (ii) Information Management: Alternative approaches to information management and potential use of computer based information systems.
- (iii) Local government practice: The use of existing and potential networks by staff in local government institutions needs to be developed.

Awareness of citizens should receive priority. Particular attention should be directed at the education of women because of their prominent role in household decision making related to waste-related practices as well as in educating the next generation.

The task of strengthening local capacities for urban environmental management should be addressed in each stage of the planning process.

Networking

One of the crucial needs in capacity building in urban environmental management is networking. Basically, the objectives of networking include sharing experiences, evaluating options, cooperation in action, and building up of appropriate information base. Therefore, it may be necessary to identify:

- (a) institutions which can function as the nodal agencies at the national, regional and local levels. A number of institutions have been listed earlier in this section of the document. Depending upon their potential and present operational level, the institutions may be identified as Nodal Centres.
- (b) Information networking must take full advantage of the global netting systems, especially Internet. The idea is to share and evaluate up-to-date information on the user's table instantly. The Nodal Centres, depending upon their level of linkage, should be connected to Internet.
- (c) HSMI may gear itself to acquire the status of a national nodal centre. This would require reorganisation and linking up with information networks.

DEVELOPING CAPACITY BUILDING STRATEGIES

11.11 The capacity building strategies will help in assimilating different issues pertaining to the "best practice". These strategies will enhance dissemination of the process acknowledged in the best practice to a wider group of actors and stake holders. The objective of these strategies will be essentially to:

- sustain the practice, in its existing form in a better and effective way
- develop ability to replicate the practice in other segments.

III. Outline of National Capacity Building Strategies

INTRODUCTION

1.1 The strategies have been formulated with a focus on capacity building at local level, including necessary institutional, legislative and financial frameworks. The studies have identified the major actors as well as tools for capacity building that will enhance dissemination of the process acknowledged as the best practice to a wider group of actors and stakeholders.

1.2 A National Forum comprising of 60 representatives from governmental agencies, research and academic institutions, NGOs and private sector organisations discussed the Draft Outline of National Capacity Building Strategies on January 31, 1996 at New Delhi and deliberated at length on inputs required for finalising the document. This document incorporates the observations and suggestions of the National Forum.

OBJECTIVES

1.3 Capacity building for urban environmental management implies building technical, financial and managerial capabilities and upgrading the institutional capacities of key actors at National, State and Local levels. This, is to help identify, understand and evaluate complex urban environmental problems and to improve human resources development by upgrading skills through training and establishing cooperative partnerships to ensure proper environmental management. Recognizing this, the objectives of national capacity building strategies for urban environmental management can be formulated in the following context:

1. To implement devolution of power to the democratically elected Municipalities which would provide broad-based representation to women and backward classes, as per the 74th CAA, within a definite time frame; to operationalise the governance closest to the people who have to play a vital role in promoting sustainable development; and upgradation of technical, financial, organizational and administrative capability of Municipalities, NGOs and target groups as well as training of technical and administrative personnel for environmental management in order to plan and implement 'Local Agenda 21'.
2. To initiate an integrated urban planning and environmental management strategy.

3. To create political and governmental commitments by evolving an Agenda for Local Area Development and incorporate the same in the Plans at all the three levels—national, state and local.
4. To create appropriate institutional arrangement backed by effective training for monitoring, self correction and improvement leading to sustainability.
5. To create awareness in Municipalities and among people about environmental problems and responsibilities, as well as environmental sanitation and work and living conditions which is catalytic in promoting direct community participation.
6. To encourage partnerships between local authorities, the community, the private sector and NGOs.
7. To provide necessary support in building the capacities of Municipalities, NGOs, CBOs and the people at large so that they may play their desired role in urban environmental management through advocacy and other programmes and activities.
8. To achieve larger coverage through replication of selected best practices and create conditions for continuous improvement of the practices.

STRATEGIES AND ACTIONS

Devolution of Power

1.4 Since protection of environment and promotion of ecological aspects is a function of the State, as a general strategy, the broad policies and programmes need to be prepared by the State Government and performance of functions and implementation of policies, programmes and schemes should be devolved to Municipalities.

Action

- a) The State Governments may entrust, by law, the function of, inter-alia, implementation of environmental protection (item 8 in Twelfth Schedule) policies and programmes to Municipalities, Ward Committees and other committees. Coordination among State and Local planning laws together with integration of environmental and planning institutions should be duly considered while enacting the laws.

- b) Municipalities should have the power and authority to formulate and implement local level policies, programmes and schemes pertaining to environmental protection and promotion of ecological aspects including control of air and water pollution.

Legal Framework

1.5 Functions and responsibilities of Municipalities must have legislative support to serve as institutions for management of urban environment.

Action

- a) Municipal laws would need to be revised to provide for:
 - i) New role of Municipalities in the management of urban environment.
 - ii) New responsibilities for monitoring of pollution levels and for undertaking health risk assessments.
 - iii) New instruments and mechanisms for measuring quality of living and working environment.
 - iv) Involvement of community based organizations and NGOs.

b) Planning and development legislations in various states need to be revised to provide for, inter-alia, modification in the development controls and regulatory framework with specific concern for environmental protection and management of urban environment.

c) Mechanism of State Finance Commission should be effectively utilized for strengthening the resource base of Municipalities by promoting internal resource mobilization and external resource devolution including financial institutions.

Institutional Framework and Capacity Building

1.6 For implementation of integrated urban planning, environment management and area development strategy, effective and efficient institutional bodies including academic institutions are needed at all levels. Initiatives should be taken for capacity building of institutions at different levels of urban environmental management.

Action

- a) Central, State, District and Metropolitan Area level institutions, require to review their own institutional set up with regard to urban environmental management, as well as the available legal and regulatory instruments for interventions at national and state levels.
- b) Establishment of urban environmental management units within both the MoUAE and MoEF as well as cooperation and co-ordination between MoUAE, MoEF and the Central Pollution Control Board.

- c) To use the intermediary services of a national NGO or of the Housing and Urban Development Corporation (HUDCO).
- d) To develop guidelines for local environmental management and planning as the major role of these national level organizations is to provide guidance and direction in policies to sub-national level organizations.
- e) To stimulate and facilitate the establishment of modern (automated) forms of data management and of geographically referenced information systems as basis for urban and environmental planning.
- f) To assist both state and local level institutions in the establishment of urban environmental planning divisions, and in the formulation of planning laws/by-laws and other regulatory instrument which are enforceable.
- g) This further requires development of:
 - (a) A strategy for institution building based on a defined framework for planning on a systems approach, utilising modern tools for compilation and analysis of data (such as GIS), and
 - (b) Regulatory tools for the twenty three metropolitan cities for short-term needs, and medium-term strategies for the three hundred Class-I cities.
- h) The Department of Planning to act as a coordinating body at state level which (i) coordinates respective activities of state level institutions, (ii) endorses guidelines for the formulation of 'Local Agenda 21' urban environmental action plans, and (iii) reviews organizational performance in the environmental field.
 - i) At local level to establish a coordinating apex body, that is an urban environmental management (UEM) cell through ratification by the mayor or the council. This coordinating UEM cell should oversee (i) the introduction of new data management (for instance by monitoring of conditions and collection of field data), (ii) establishment of geographical information systems (GIS), and (iii) the formulation of urban environmental action plans (Local Agenda 21). The activities of the UEM shall also be associated with the process of public consultations within District or Ward Planning Committees (In those towns where the UBSP network of community counselling is in existence, it may be useful to link UBSP concerns also with urban environmental concerns).

- j) The Municipality should be connected through an effective mechanism with the line agencies of the State to obtain funds and also to relate local development to State policies, programmes and priorities.
 - k) Urban environmental action plans (Local Agenda 21) are to be prepared in close consultation with selected NGOs, CBOs and other stakeholders and targets and performance standards are to be set which are realistic and achievable with a phased time frame and the given resource constraint situation. The targets in the plans are to be duly incorporated in the National Plans and monitored.
 - l) At the intra-city level, the Ward Committees, constituted under 74th CAA, in cities having 300,000 or more population, should function as agencies to formulate intra-city action plans through effective community participation.
 - m) Community participation should be institutionalized and community-based organizations (CBOs), NGOs and such other groups, including residents' associations, should be effectively utilized to address environmental problems at the neighbourhood level.
 - n) Roles, responsibilities and jurisdiction of each organization at different levels should be clearly defined so that there is no overlapping or contradiction of jurisdiction and repetition of work. Links among different levels of hierarchy of organizations should be well established.
 - o) Appropriate planning, administration and management structure should be established in institutions at different levels to achieve effective and efficient urban environmental management.
 - p) Recovery of user charges together with entry of private sector should be encouraged to make the service viable.
- programme of human resource development is necessary. It should include:
- i) All target groups, including political leaders, policy makers, administrators and practitioners in all disciplines related to urban environmental management.
 - ii) The national and international agencies providing technical and financial assistance should also develop an appreciation for every aspect of local government administration in the context of the 74th CAA and formulate appropriate policies and programmes for the human resource development.
 - iii) In particular, HSMI along with other collaborating institutions in this field need to concentrate on programmes such as orientation workshops for senior level municipal and state government administrators, politicians, and other functionaries; seminars for NGOs and CBOs; and national and international workshops, involving researchers, academicians and resource persons/trainers.
- b) Special courses should be introduced in all dimensions of environmental management in various institutions of higher learning to train manpower needed for environment management.
 - c) For increasing community awareness related to environmental issues and problems and also to inculcate public participation in environmental management programmes there is a need to educate the people through appropriate multi-media programmes.
 - d) Training of officials and professionals engaged in management and monitoring of environment should be initiated by relevant institutions and NGOs.
 - e) Research activities in environmental management procedures and technological improvements should be encouraged and supported to provide training material.

Human Resource Development

1.7 For better environmental management, the capabilities of Municipalities should be enhanced. Training in the areas of awareness creation and skill development should be based on an understanding of the relevant environmental issues, of practices and experiences in environmental management and use of effective environmental management tools and procedures. 'Best Practices' in urban environmental management may be utilized as case materials.

Action

- a) To cope with the changes of vast dimensions as a consequence of 74th CAA, a comprehensive

Training Strategy

1.8 The development of a training strategy for urban environmental management as a part of a wider National Training Strategy for Urban Development and Management which aims to support decentralization and the development of local urban institutions.

Action

- a) Design a training strategy based on two principles: (i) the application of a 3-tier approach, and (ii) a mix of policy seminars, management training, and skill development cum in-service/on-the-job training.

- b) Prepare training materials that make use of the experiences and lessons from 'Best Practices' to the maximum extent possible.
- c) Use 'real, life' situations for training and awareness creation and address tangible environmental problems as this type of 'learning from doing' can provide a direct and concrete impact in awareness creation.
- d) Design a training strategy that is directed mainly towards local level organizations and involves members of NGOs and CBOs in the training process (both as participants as well as resource persons).

Environment Management Information System

1.9 An environment management information system should be applied to help planning, implementation, monitoring and evaluation efforts.

Action

- a) An appropriate nodal agency be identified for managing the Environmental Management Information System (EMIS). Urban Management Programme (UMP) indicators for environmental management should be utilised for EMIS to harmonize data collection. Proper tools as well as planning framework should be developed to utilise the data for EMIS.

Information Systems for Public Awareness and Empowerment in Policy Making

1.10 Create awareness and help to bring about behavioural changes.

Action

- a) To inform the citizens, the private sector as well as governmental and non-governmental organizations about environmental concerns, 'Best Practices', and the necessary precautions which should guide individuals as well as economic and other activities in their behaviour as it has direct consequences on the environment (for instance disposal of waste, production of energy, etc.).
- b) To organize information and awareness campaigns through environmental education for school children and youth (for instance in collaboration with the Ministry of Education), housewives (for instance through adult literacy programmes), and public campaigns in urban neighbourhoods.
- c) To use as mechanisms for such campaigns public meetings, media such as printed matters (folders, leaflets, posters, wall paintings), interactive forms (such as street plays), media campaigns through

newspapers, radio, television, or even utilize high-tech channels (such as Internet).

- d) To create a sound data base for public awareness and information taking full advantage of computerised techniques which should be available mainly with the nodal agencies, such as Informatics at the state level, HSMI and also with private agencies.
- e) To promote easy dissemination of such information through the existing communication channels and also in form of computer discs and videos. State level Informatics should evolve appropriate standardized formats for such information gathering, storage and dissemination. Languages for the information should be English, Hindi and the respective regional language.
- f) To develop a system of public hearing to every planning project as a part of awareness promotion and to encourage awareness against pollution more forcefully.
- g) To develop school curricula right from the primary stage and ensure that informal channels of schooling should also incorporate appropriate inputs regarding environmental sanitation, health and hygiene, reuse of wastes at household and neighbourhood levels and other related aspects.
- h) To expose children right from an early age to actual field situations and facilitate their interaction with non-governmental agencies operating at the local levels.

Public-Private Community Based Partnership

1.11 Public - Private Sector participation should be encouraged in urban environmental management programmes.

Action

- a) The areas of private sector involvement should be identified and depending upon the requirements, appropriate partnership methods should be adopted. Public-Private Partnership should be encouraged.
- b) An efficient networking of NGOs and CBOs engaged in urban environmental management programmes through advocacy and other approaches should be established.
- c) Some selected organizations should act as nodal agencies for activities such as specialized documentation, training, disbursement of funds and research, taking into account the geographical area and level of operation. These organizations may be hierarchically grouped as national, regional and local.

- d) All the NGOs and CBOs and their networking should be documented as suggested above.
 - e) Capacities of NGOs and CBOs should be strengthened through financial support and technical training in the art of advocacy, media management and organization of people's movement.
- b) Provide support systems to the small-scale and informal sector that will address the issues of child labour, occupational health and working conditions.

Environmental Sanitation and Solid Waste Management

1.12 Promote the provision of environmental sanitation and solid waste management systems through efficient and cost effective ways. Development of appropriate technology and sewerage management also should be included.

Action

- a) Involve on a large scale, private sector parties and NGO's in the provision of low cost sanitation tasks including the provision of toilets at the family and community levels. Involve the private sector, NGOs and beneficiary households, in the collection, segregation and even partly reuse and disposal of solid wastes.
- b) Looking at the enormity of the task of providing toilet facilities and solid waste management facilities, a bigger role for NGOs, CBOs and private sector initiatives should be encouraged. Standards should be set and techno-financial support should be given so that households can take up the task of environmental improvement on their own.
- c) Set standards and promote a regulatory role which is more promotive than punitive.
- d) Create support facilities through direct technical assistance in building up training and information base for the private sector and NGOs with continuous re-assessment of their changing role.
- e) Give appropriate support and opportunities for consultation and decision-making to women so that they can effectively mobilize the communities towards the collective task of improving the environmental situation at the local level.

Improvement of Work Environment

1.13 Develop adequate mechanisms to provide support to entrepreneurs in terms of improvement of working conditions, environmental pollution control and employment generation.

Action

- a) Develop policies that provide incentives for adoption of cost-effective and environmentally friendly

technologies and remove legal and administrative constraints for their dissemination.

Wider Replication of Best Practices and Follow-up

1.14 It is important to create the means to maximize the effects of the best practices. This is possible when the practices are appropriately analyzed in terms of their strength, weaknesses, opportunities and threats, and after assessment are scaled up, replicated in wider and divergent areas and are implemented as integrated inter-sectoral packages.

Action

- a) Disseminate and remove the bottlenecks, prepare regulations to promote successfully tested practices and extend technical and financial support for wider replication where necessary. Some incentives should also be introduced for wider replication.
- b) The practices which are interrelated and can be grouped into a viable package should be encouraged especially those which include effective training and skill development schemes for the personnel involved.
- c) As a second stage of the endeavour detailed strategies which will be prepared after the basic framework of the outline is finalized should be implemented in selected four or five urban areas to gain insight on the aspects and areas of management where changes are necessary and improvements possible.

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Errata

Page	Read	As	
27	Column 2 line 6	"because to"	"because of"
30	Column 1 line 28	"loyer"	"Employer"
32	Column 2 line 48	"as"	"has"

HUDCO and HSMI

The Housing and Urban Development Corporation (HUDCO) was established in 1970 under the Ministry of Urban Development as a techno-financial institution for dealing with the problems of housing and urban development. The main thrust of HUDCO has been to provide financing for the economically weaker sections of the society. Lately, in 1990s, HUDCO has acquired an all-pervasive presence in the field of housing, infrastructure, building materials, construction technology and research and training.

The Human Settlement Management Institute (HSMI) was founded in 1985 by HUDCO in collaboration with the Institute for Housing and Urban Development Studies (IHS) with the purpose to develop training programmes for technical and managerial staff of HUDCO's borrowing agencies as well as for the wide group of municipal administrators and professionals.

In addition to training, HSMI has been conducting on a regular basis research on new urban development matters, and incorporated these case studies into the various training materials developed at HSMI. Presently, the HSMI is also the Secretariat for the HABINET programme which is an international networking collaboration between six urban development training institutions: HSMI (India), IUIDP/Cipta Karya (Indonesia), NHA (Thailand), CHPB (Sri Lanka), CHS (Tanzania) and CEHAP (Columbia).

THE IHS

The Institute for Housing and Urban Development Studies (IHS), Rotterdam, The Netherlands is an independent, non-profit organisation. Since its establishment in 1958, IHS has offered training and related professional services in the field of housing and urban development management, with a focus on low-income settlement in developing countries.

Particular emphasis is placed on developing the institutional capacities of urban development related organisations in developing countries.

IHS organises various types of courses such as a 5-months post graduate course, short courses of 3-6 weeks, tailor made courses and 16 months master degree courses in urban management. Master courses will also be developed in the fields of urban heritage and renewal and urban environmental management.