


HUDCO Award for Best Practices to Improve the Living Environment






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A HSMI-HUDCO Publication

A compendium of the award winning and other entries for the "HUDCO Award for Best Practices to Improve the Living Environment" 2011-12.

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Foreword

Housing and Urban Development Corporation (HUDCO Limited) is a techno financial organization fully owned by the Government of India and is administered by the Ministry of Housing and Urban Poverty Alleviation. It was incorporated in 1970 to meet the demands and fulfil the gaps in the housing sector, especially for the economically weaker sections. To meet the rising needs of urban infrastructure in the country, HUDCO opened its infrastructure funding portfolio in the nineties. Today, in addition to housing HUDCO extends loan assistance for projects in the various sectors including water supply, sewerage, power, transport, solid waste management, industrial infrastructure, social infrastructure and commercial infrastructure. HUDCO not only provides loan assistance for projects in housing and infrastructure, but also offers consultancy in project design and development. It is also involved in building technology promotion for sustainable, green and affordable solutions for construction. It takes up capacity building assignments in these sectors through its research and training wing: Human Settlement Management Institute. The vision of HUDCO is to be amongst the world's leading knowledge hubs and financial facilitating organizations for habitat development. The company's mission is to promote sustainable habitat development to enhance quality of life.

Today's world is fast urbanising and India has a major share in this process. The pace of urbanisation throws many challenges including better governance, management of services, innovation in systems and technology to meet the aspirations of the growing economy while keeping the needs of the underprivileged strata in mind. The world-wide impact of the climate change has forced us to relook at our approach to planning and development. We are in urgent need to adopt sustainable methods and practices, right from project conceptualisation to the delivery at the grassroots level.

In line with its commitment to the housing and infrastructure sectors, HUDCO has institutionalized the "HUDCO Awards for Best Practices to Improve the Living Environment" in 2011-12. This is a small intervention to bring together on a single platform various practices prevalent at the various tiers of the government and private enterprises involved in housing and infrastructure development in India. The objective is to identify and appreciate the best practices which are instrumental in moulding the urban habitat in a sustainable

and inclusive manner, making them worthy for replication within the local context.

The HUDCO Best Practices Awards for the year 2011-12 were presented on the HUDCO Annual Day on 25th April 2012. Entries were invited in the various categories namely, Urban Governance, Housing, Urban Poverty & Infrastructure, Urban Transport, Environment Management, Energy Conservation & Green Building, Urban Design & Regional Planning, Inner City Revitalization and Conservation and Disaster Preparedness, Mitigation & Rehabilitation.

The Best Practices need to be publicized and disseminated for purpose of wider adoption in various housing and infrastructure projects throughout the country. For this purpose, HUDCO is bringing out this publication which contains a summary of all the winning best practices highlighting their salient features. HUDCO had received more than 60 entries for consideration of this award. The jury selected 9 of these entries for receiving the HUDCO Award. Not all entries could be winning entries, however, all the entries exhibited their commitment and resolve for improvement in the quality of our habitat directly or indirectly. A summary of the various entries received by HUDCO has also been included in this publication for information and reference.

It is hoped that the efforts of HUDCO in bringing out this publication will be received well and the projects and practices featured in this publication will inspire many agencies to improve in the approach, delivery and management of various habitat related projects in our country for betterment of our living environment.

VP Baligar, IAS
Chairman and Managing Director, HUDCO

Acknowledgements

We wish to sincerely thank Chairman and Managing Director, HUDCO, Shri VP Baligar for the guidance and support in institutionalising the "HUDCO Awards for Best Practices to Improve the Living Environment". The editorial team wishes to acknowledge the various award winning and other entries for showing interest in the "HUDCO Award". The varied range of entries received from local and state level bodies exhibited a desire towards innovation in approach and improvement in governance and management of urban services. It is heartening to note that local urban bodies which are widely considered to be limited in capacity and resources, are in no way shying from seeking and applying innovative approaches for improvement in their respective realms of work.

We extend our heartfelt thanks to the eminent professionals and academicians namely Professor Chetan Vaidya, presently Director of School of Planning & Architecture, New Delhi and ex Director, National Institute of Urban Affairs, New Delhi, Dr K K Pandey, Professor, Indian Institute of Public Administration, New Delhi, Dr A K Nema, Associate Professor, Department of Civil Engineering, Indian Institute of Technology, New Delhi, Dr HS Gill, Executive Director, HUDCO and former Head, Centre of Project Development & Management, HSMI and Shri Alok Kumar Joshi, Senior Fellow, Human Settlement Management Institute, HUDCO who constituted the Awards jury and carved out time from their busy schedules to meet on a number of occasions for deciding upon the winning entries based on the selected criteria. Due to the high quality of most of the submissions, the task of zeroing upon the awardees was no mean a task.

We extend our sincere thanks to the Administration and Finance Wings of HSMI for their support in bringing out this publication.

We hope that the "HUDCO Awards" shall find wider support from all over the nation, in the coming future so that HUDCO is able to go a step further in the direction of its commitment towards facilitating sustainable habitats.

Executive Director, Training
Human Settlement Management Institute, HUDCO

Award Winning Entries

The following entry submissions were felicitated with the HUDCO Awards on 25.4.2012 during the Annual Day ceremony. They are listed below in no order of preference.

- Special Award to Kudumbashree, Kerala for Kudumbashree-State Poverty Eradication Mission for Slum Improvement through Community Network under the category of Social Housing, Urban Poverty & Infrastructure and Inclusion of Women in Leadership Roles, Decentralisation & Institutional Reforms.
- Award to Jabalpur Municipal Corporation, Madhya Pradesh for Implementation of Management Information Systems in Jabalpur Municipal Corporation under the category of Urban Governance: E-Governance.
- Special Award to Suryapet Municipality, Nalgonda District, Andhra Pradesh, to Improve the living environment in the City under Environmental Management Category.
- Award to Chhattisgarh Housing Board for Deendayal Awas Yojana and New Atal Awas Yojana under the category Social Housing, Urban Poverty & Infrastructure.
- Award to Amber Development & Management Authority, Jaipur (Rajasthan) for Development of Amber Palace, Amber, Jaipur under the category of Heritage Building Conservation.
- Award to Bangalore Metropolitan Transport Corporation, Karnataka for Construction of Traffic Transit & Management Centre at Bangalore under the category of Urban Transport.
- Thane Municipal Corporation for overall city development initiatives.
- Award to Ahmedabad Municipal Corporation, Gujarat for Kankaria Lake Redevelopment and Sabarmati Riverfront Redevelopment to Improve the Living Environment under the category Environmental Management
- Award to Karnataka Slum Clearance Board under the category for application of new initiatives in construction technology for affordable housing (Light Weight Construction Technology).

Kudumbashree-State Poverty Eradication Mission for Slum Improvement through Community Network

A special prize was awarded to Kudumbashree for its State Poverty Eradication Mission for Slum Improvement through Community Network under the categories of Social Housing, Urban Poverty & Infrastructure and Inclusion of Women in Leadership Roles, Decentralisation & Institutional Reforms. In Kerala, under the Integrated Housing and Slum Development programme (IHSDP) of the Jawaharlal Nehru National Urban Renewal Mission (JnNURM), 45 Urban Local Bodies are engaged in works including infrastructure upgradation pertaining to housing, sewerage, road, sanitation and drinking water. The Kudumbashree is the State Level Nodal Agency for anchoring all the centrally sponsored schemes for the upliftment of the urban poor in the State. The project submitted for the best practice is located in Chavakkad Municipality in the west coast of Thrissur District. It is a small town extending for an area of 12.41 square kilometers, accommodating a total population of 38,188 and literacy rate of 92 per cent. The majority of the work force in the area is casual labourers involved in beedi making and fishing.

Status prior to Implementation of the Programme - Due to lack of regular income and poor living conditions, slums emerged in the town of Chavakkad. Out of the 27 notified slums in the town, 7 most vulnerable colonies with a total population of 821 were identified under the IHSDP, based on a survey conducted by the Community Development Societies in 2006-07. The inhabitants of these colonies were mainly casual labourers. The situation prior to the intervention is summarised in the table below:-

Sl. no.	Name of the Slum Cluster	Population	Area (acres)	Sex Ratio	Literacy rate (per cent)	Housing	Drinking Water	Sanitation
1	Pallithakazam	174	2.9	1941	82	49 units (85% kutcha)	community tube wells	Poor toilet facilities, no sewerage network
2	Vanchikadavu	84	0.45	1000	100	16 units (95% kutcha)	community well	Toilet available, No sewerage net work
3	Thiruvatra	106	0.80	1320	93	17 units (75% kutcha)	community tube well	Community Toilet, No sewerage net work
4	Gramakulam	82	0.93	886	96	17 units (75% kutcha)	community tap	Poor toilet facilities, No sewerage net work
5	Edapully Laksham Veedu	98	1.43	1040	92	24 units (30% kutcha)	community well	Toilet available, No sewerage net work
6	4 cent Colony	79	0.63	1174	94	15 units (40% kutcha)	community well & tap	Toilet available, No sewerage net work
7	Pazhayam Palam	119	1.1	1222	95	20 units (60% kutcha)	community well	Poor toilet facilities, No sewerage net work

Kudumbashree was launched in 1998 for wiping out absolute poverty from the State through concerted community ation under the leadership of Local Self Governments (LSGs). It is built around three critical components, micro credit, entrepreneurship and empowerment. Kudumbashree has a three tier framework

a. **Neighbourhood Group (NHG) – the lowest tier constitutes the NHGs consisting of 10-20 women members from economically backward families.**

b. **Area Development Society (ADS)- ADS is formed at ward level by federating all the NHGs in the ward.**

c. **Community Development Society (CDS)- CDS is a registered body, constituted at LSG level, federating all the ADS in the Panchavath/Town/City level.**

The IHSDP programme of 2008 - The aim of the project was to improve the quality of life of the urban poor in Chavakkad through improving the condition of housing stock, provision of efficient services to each household, ensuring equal access to social and community facilities and economic empowerment of the community through effective use of untapped literate female workforce.

The total project cost was around ₹ 167 lakhs, where Govt. of India contributed 136 lakhs, Govt. of Kerala's share was 16.73 lakhs, ₹ 4.31 lakhs was contributed by the Municipality and the remaining came from the beneficiaries. The general category beneficiaries were required to contribute ₹ 7.24 lakhs for housing, Scheduled Castes and Scheduled Tribes category had to put in ₹ 1.22 lakhs and other reserved categories contributed ₹ 1.45 lakhs.

Participatory planning was the key tool adopted to identify the critical problems and the priorities for adoption of socio economic strategies for development of the clusters. Participatory approach was adopted for appraisal, needs identification, planning, implementation, organisation and evaluation. The primary task was to identify the Key Non-Governmental Organisation/ Community Building Organisation to intervene in the community. Kudumbashree networks were already present in all the clusters which were the key threads to penetrate into the communities. In the beginning of the programme there was no grass root team to take the programme forward. Lack of community resource was a major drawback and a focussed intervention in this regard was the need of the hour. A special drive was initiated to form NHGs as a basic requisite for the advancement of the programme in the project clusters. The CDS was vested with the responsibility of mobilising the community to form NHGs and 12 new NHGs were formed during the project period.

After project approvals were obtained CDC was formed in all the clusters on the basis of the state guidelines of IHSDP, with representatives from ADS, general public and beneficiaries. The CDS gradually took the role of a 'contractor'. They pooled in antique woodwork and other raw materials for construction from demolished structures for building cost effective houses in the clusters. The ADS took an active role in arranging bulk purchase of materials for beneficiaries, thereby facilitating early completion while bringing down individual costs. Accessibility to a local planner to draw up a structural design with basic functionalities was facilitated by the CDS with minor fees of ₹ 300 per plan. 87 destitute families were given lay out plans for free as part of the Ashraya programme of the Kudambashree. Women of the network offered labour and support for these families to complete their houses. CDs took the initiative to arrange loans of ₹ 10,000/- each from the Indian Overseas Bank for the beneficiary towards their contribution. In case of budget overrun,

the CDS was again instrumental in getting sanctioned additional bank loan of ₹ 25,000 to each beneficiary. Every stage of house construction was monitored by the CDS which ensured that proper kitchen and toilet were there in each house. Smokeless chullahs were organised by the CDS with help of the NGO COSTFORD.

The Impact of the project- A total of 79 new houses was constructed under the project. Each cluster was upgraded with physical infrastructure such as efficient drinking water supply, rainwater harvesting structures, covered sewerage network, sewage treatment plant and biogas plants, legal electric connections, tarred approach roads with street lighting and fencing; as well as social infrastructure such as libraries, anganwadis, study centres for girl children, community halls, health clinics etc. With the help of CDS, individual and group micro enterprises have mushroomed in many parts of the clusters. Small manufacturing units which make face wash, thirst quenchers, incense sticks, fritters etc. have been established. The financial empowerment and increased coping strategies are visible in the loans that have been raised by way of linkage banking. The entire CDS raised ₹ 1.5 crores as loan. The collectivism has brought in a sense of ownership for sustaining local development activities. The women structures are now able to implement and monitor the whole process and are able to exercise their right for entitlements instead of remaining at the fringes. The NHGs have been increased from 12 to 40. Destitute and mentally ill are taken care of through the collective community process. The Kudambashree network supported in building not only a quality living environment but also provided a platform for access to menu of services such Public Distribution System (PDS), health care, widow pension etc. for a sustained quality of life.

Conclusion - Slum upgradation through Community Participation ensures successful planning, implementation and sustainability with short term and long term positive

impacts. The whole experience of the Kudumbashree has been documented and disseminated for replication in other towns of the State. Decentralisation and participatory planning by women network is very effective method for adoption in slum improvement programmes which strengthens local self-help capacities and improves the status of women and disadvantaged groups among the Economically Weaker Sections. This approach encourages accountability & transparency in governance, local empowerment, people's participation and integration of local knowledge.

Implementation of Management Information System in Jabalpur Municipal Corporation

The Jabalpur Municipal Corporation won HUDCO Award under the category of "Urban Governance" for its e-governance initiatives. Jabalpur Municipal Corporation is one of the pioneers in harnessing the power of Information Technology in Madhya Pradesh. Jabalpur Municipal Corporation provides a wide range of municipal services to its citizens which include services pertaining to health, sanitation, education, safety and utilities such as water supply, drainage, street lighting, roads etc. Information Technology Enabled Systems have been put in place in Jabalpur Municipal Corporation to enable standardizing these processes, obtaining timely and accurate information and thereby benefiting 14 lakhs citizens of the city .

Situation before the initiative began: On June 1, 1950 when Jabalpur Nagar Nigam was established there were only 30 wards. Later on this number increase to 60 wards. Last year 60 wards were further subdivided into 70 wards. The subdivision of wards led to many problems in record management which were severely affecting the various municipal functions and activities.

Establishment of Priorities: Property tax is the main source of revenue for Jabalpur Municipal Corporation. Hence, top most priority was given to computerize property tax collection. Module-wise priority for computerization is as follows:

1. **Property Tax, Water Tax and Shop Rent:** These include 1.69 lakh ledgers of property tax, 1.19 Lakh ledgers of water tax and 2312 ledgers of shop rent online, tax information through Short Messaging Service (SMS), Online facilities of Tax Calculator, bill generation, payment gateway for 40 banks, real time updating, etc.

2. **Death and Birth Certificate:** Central database for 20 years is made online. Search of death & birth registration, online issuing of Death and Birth Certificate with signature is included.

3. **Social Security Scheme:** Database of 24,189 beneficiaries was made online, ward-wise search option, individual ledger of each beneficiary is updated on real time basis.

4. **Citizen Mobile Vehicle:** This is fitted with computer printer and connected with central server through internet. Display system shows transaction details and other data to the citizen, providing all facilities in a single window.

5. **Vehicle Tracking Management System:** Global Positioning System (GPS) is fitted in 72 vehicles for last one and half years, aimed for efficiently managing the utility services. This saved ₹ 51.25 lakhs in one year in fuel cost.

6. **Geographical Information System:** Base Map is prepared having 8 layers e.g. ward boundaries, zone boundaries, tax zone, property, main roads, landmarks, railway lines and water bodies is being used in household survey for urban poor, tax management and development schemes.

7. **Booking of Community Halls:** This includes display of list of all community halls with their reservation status on different dates at website. Online payment and booking on vacant dates is available.

8. **License:** This includes online payment and renewal, license generation with e-signature through online central database.

9. **Ration Card:** 2.05 lakhs ration cards details can be viewed online.

10. **Building Permission:** Online list of all application received and disposed status of the case can be viewed online.

11. **E-Library:** Facilities of searching online books for more than 40,000 books on the basis of title, author, subject and publication is available. Every book has barcode.

12. **Project Monitoring System (PMS):** on sanction stage, each project is registered in PMS. Unique registration number generation, budget deduction as per administrative section and its reflection in double entry accounting system on real time basis is part of the system. Project can be monitored at different stages e.g. tender stage, work order stage, etc.

13. **Jabalpur Municipal Corporation website** is a well-designed and highly informative website where all relevant information is available to the citizens.

Process: The biggest challenge was the change management. Adopting keyboard for running the systems and processes, at first, appeared daunting for hundreds of frontline clerks and counter operators. Computer and system related training was imparted to the staff so that they attained the working knowledge and gained confidence in handling the applications. The departments and employees having tested the fruits of computerization are now eager to try to incorporate Information Technology enabled solutions in more and more processes.

Result Achieved: Water tax collection has increased from ₹ 1 crore to ₹ 11.42 crore. The number of registered water connections has increased from 35,303 to 1,23,000. Property tax payers have increased from 1.45 lakhs to 1.69 lakhs.

Sustainability: A new Management Information System (MIS) system has been maintained by Jabalpur Municipal Corporation for last 5 years. As the outcome of this new modernized system, processes are very much user friendly and beneficial to the Municipal Corporation. It will definitely be continued in a longer run.

Financial Sustainability: By introducing this new MIS system, the yearly revenue collection has been increased manifold than the previous years. Many private properties are identified and pending taxes levied with penalty. Many Govt. properties are released from illegal occupation and thus extra revenue generated. The revenue collection staffs of JMC also had a better hold in the target, collection and deficit balance positions of their respective area of operations by using this MIS system. More revenue collection leads to more development works in the Municipal Corporation. Jabalpur Municipal Corporation now is in a better position to pay back its loan installments in time.

Socio-Economic sustainability: MIS software of Jabalpur Municipal Corporation helps citizens in tracing and noting their exact tax pending or payment positions, helps in saving penalty provisions etc. It has also supported Jabalpur Municipal Corporation in providing better quality municipal services like better roads, cleaner drains, creating more green taps, regular potable water supply and adequate solid waste management system in a city which always creates a conducive social environment for its citizens to live comfortably. It also reduces stress of traffic jams, pollution and epidemics. By introducing this new MIS, the Jabalpur Municipal Corporation has consciously supported its citizens to lead a better life.

Environmental sustainability: Introduction of E-Governance MIS has indirectly helped the overall ecology due to less use of paper and files.

Transferability: There is no ideal structure of solutions for successful implementation of e-governance solutions but political will and skilled manpower is essential for implementation of e-governance solutions in any Urban Local Body. Even the District Rural Panchayat Bodies can take benefit from introducing MIS. The lessons learnt by Jabalpur Municipal Corporation during the period after introduction of this MIS also can help the partners to devise and introduce more conductive and user friendly systems and processes for the future.

Environmental Management by Suryapet Municipality, Nalgonda District, Andhra Pradesh

Suryapet Municipality is a Grade - I Municipality in Nalgonda District of Andhra Pradesh and spread over an area of 24 square kilometres. As per the 2011 census, the population of the town is 1.05 lakhs with about 26,000 households. Suryapet Municipality is a pioneer Municipality in Solid Waste Management and many environmental conservation activities have been taken up to sustain solid waste management and to conserve the ecological balance and protect the environment. In order to reach this objective the municipal staff mobilized the urban poor through Self-help groups and harnessed a sense of ownership and responsibility among the urban poor. The projects that were taken up by the women groups with the philanthropic support of stakeholders in the city of Suryapet include the massive plantation of 1,18,000 samplings in various localities in the last two years.

Lake Water Conservation cum Rain Water Harvesting has been developed in the tanks of the town. Sewage water from the town was diverted from lake water. Sewage Treatment Plant would be constructed on the bank of Nalla Cheruvu. Tree plantation has been done near the tanks in order to decrease water evaporation and the tree plantation in the catchment areas has been taken up to increase the rains in those areas. Around 13,000 plants have been planted in these areas with the partnership of Loyola College, Sneha Nilayam, Idgah and Aravindaksha College. The encroachments along the tanks were removed involving the staff, with the help of officials and district administration. Kitchen gardens were also taken up, through meetings conducted among self-help groups. Energy conservation was taken up by the Municipality as an effort to go eco-friendly in terms of lessening its carbon footprint by means of introducing programmes such as Sun Synchronisation (reducing the hours of usage of electricity by switching of lights and machinery when not required) and Standardization (implementing the standardization chart supplied by Bureau of Energy Efficiency (BEE), whereby urban administrators were requested to discontinue use of higher wattage luminaries. Solar energy lanterns have been distributed to most of the staff. In partnership with Non-conventional Energy Development Corporation of Andhra Pradesh Limited

(NEDCAP), solar lanterns have been sold to the urban poor on a subsidy. The Mosquitoes menace has been eradicated by the use of the Addasaram leaves and by introducing Gambusia fish in the stagnant waters. Research has proven that the Gambusia fish thrive on the larva of the mosquito hence the cleansing of stagnant water takes place. Periodic meetings were conducted with all stakeholders including the beneficiaries to educate, communicate and bring behavioral changes that would result in the community members taking responsibility towards sustaining the projects and bringing greater socio-economic gains to the people.

Situation before the Initiative Began: Due to decrement in plant population, the summer was very hot and there were scanty and delayed rainfall in 2009. Some good practices had been discontinued in Solid Waste Management. Garbage was starting to pile up in the open spaces, streets, consumption of plastic had increased. By 2009, the town had become infested with mosquitoes and 100 Dengue cases were reported. The tanks in the town were encroached upon. The ground water table has gone down, affecting the quality of ground water. The consumption of energy had gone up in municipality and town.

Process for Overcoming Challenges: Mission was "At least 2 plants per person should exist in the town of Suryapet". Initially one Non–governmental Organization (NGO) was requested to assist but later on dedicated staff was allocated for plantation work. Avenue plantation for the town was done with the help of Andhra Pradesh Urban Finance & Infrastructure Development Corporation Limited (APUFIDC) and compost yard plantation was done through the Forest Department. The expenditure was borne by the local body. The accessing of plants, especially usufruct plants, was done through philanthropic persons. One NGO, Arthika Samatha Mandali had given plants on low cost. Plants have also been collected from philanthropic persons and these were given to the urban poor free of cost. The Forest Department gave 23,000 plants. While plants were available in abundance, space for plantation was not available to the urban poor. Hence, kitchen gardens were taken up along with the utilisation of outside space for plantation.

This concept was again explained to the self-help groups and later the Slum Level Federations accepted to plant at least one usufruct sapling, subject to the condition of free supply. Some organizations had also demanded the enforcement of the Andhra Pradesh Water, Land and Trees Act – 2002 or the WALTA Act, for having minimum number of plants in a new building space. The condition was made a part for issuance of building permissions and licenses. There was no protection for plantation in open spaces. The same was overcome by construction of protection walls under "parks and play grounds scheme". Protection of avenue

plants continued to be a problem, though country fencing was laid, the Municipal Commissioner, the municipal staff, section heads were responsible for watching the survival of plants during their daily rounds. Large scale capacity building and information dissemination activities were taken up in the town under Solid Waste Management, and those citizens who litter the place were fined heavily. The plastic ban was facing problems of implementation. Different associations (kirana shop, hotels and meat shops) were requested to give incentives to customers on bringing a cloth bag or box for carrying material. Two sheds have been constructed for taking up for processing of dry waste. Alternative materials were distributed freely by the municipality and philanthropic persons.

Results Achieved: The total number of saplings planted in the town in two years was 1,18,000. The ambient air quality is good in town and compost yard as well. Fruits and vegetable such as drumstick, banana, and papaya were made available to poor through usufruct plantation and kitchen gardens. Waste water was utilized for plants allowing recycling of water. Plantation work was the team effort of Suryapet Municipality involving the self-help group (SHG) network, NGOs, Philanthropists and the District Administration. Dry waste selling, wet waste recycling has increased, providing small quantity of revenues to local body. The banana plantation has decreased the consumption of plastic. The dengue cases in the town have decreased from 100 to 10 after the Gambusia fish and Addasaram leaves initiative. Lake conservation increased the ground water table in town and recharged the surrounding bore wells. The contamination of water in bore wells had decreased in numbers. Flora and fauna had also increased around the lakes and town. The honeybees, country birds, cranes, butterflies have increased in the town,

increasing bio-diversity. Earlier, one tank by name Chaudari tank was fed with Musi water. Now the tank is filled with rain water only.

Sustainability: There are earmarked funds for Solid Waste Management, Mosquito eradication, tree plantation and maintenance of parks and play grounds under Municipal General Funds. The property tax, which incorporates solid waste management as one of its components, has been rationalized on 100 per cent properties. Revenue Improvement Reforms were also taken up, deriving additional income. The collection of dry waste is outsourced totally. It has reduced the expenditure on solid waste collection. Sale of dry waste and vermin-composting also generate small amounts of revenue. These activities take care of the cost recovery and the financial independence of the local body, ensuring the sustainability of the initiatives taken up by the local body. There has been a considerable behavior change among the citizens of Suryapet. Awareness has increased with the knowledge on the importance and benefits of a clean green city and the impact that individual contribution would do to such activities.

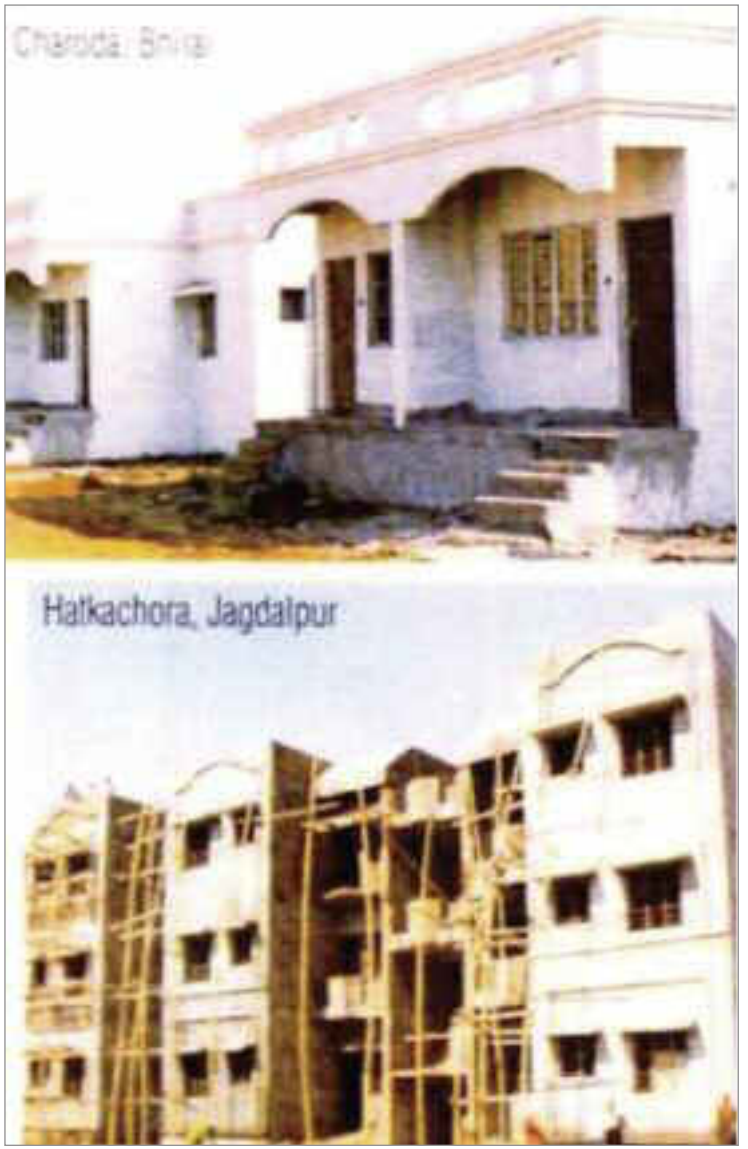
Transferability: The Suryapet model is being replicated by many municipalities in the State and outside the State such as Karnataka, Chattisgarh, and Madhya Pradesh. The other areas of the district started emulating the experience of Suryapet town. The Commissioner, Suryapet is the co-coordinator for monitoring the plantation in the district that was taken up by the Council for Green Revolution, involving the school children. District Collector has instructed other urban local bodies and district administrators to emulate the green activities of Suryapet municipality. Suryapet has imparted trainings to the officials of the other urban local bodies and in rural areas, on the instructions of the District Collector.

Chattisgarh Housing Board for Deendayal Awas Yojana and New Atal Awas Yojana under the category Social Housing, Urban Poverty & Infrastructure

HURRAH ! SING AND DANCE !
CGHB was formed to fill a vaccum. It focusses on the housing needs of the poor and low income group.
Photo: Tribals dancing at a ceremony in Korba, organised for handing over of completed LIG houses, January 2007

In keeping with the trend of liberalisation and privatisation, the Chattisgarh Housing Board was dismantled in 2002 in the hope that private sector builders will effectively serve the demand of housing. A construction boom was witnessed. But it was seen that the private-sector builders were focusing, only on the top-end economic bracket and neglecting the lower economic end of the housing market. To protect the interests of the Low Income Group (LIG) and E conomically Weaker Sections (EWS) segments of the housing market, the Housing Board (CGHB) was re-constituted in 2004, with a clear mandate to focus on social housing (LIG and EWS housing).

Deendayal Awas Yojana was launched to provide for LIG housing. The objective was to provide a decent two bedroom dwelling unit at an affordable price of around ₹ 2,00,000/-. A target of 10,000 dwelling units was fixed. The scheme was a run-away success. CGHB then focused on Economically weaker



section (EWS) and launched New Atal Awas Yojana guided by some radically new thinking. This scheme was also a great success. These two flag-ship social housing schemes of CGHB have not only created a substantial housing stock, they have also had a catalytic effect to keep the prices of dwelling units built by private-sector builders under check.

Situation before the Initiative Began: Private sector builders were interested only in the top-end and were neglected the low end demand. Alongside a number of unsold dwelling units in Raipur, there was the fact that no house was available for less than ₹.10,00,000/-. More than 80 per cent of the urban population was low end and unable to afford the cheapest house in the market.

Process: For implementation of both the schemes, finding low cost land was a major challenge. After Chattisgarh became a State in 2000, urban land had become scarce and expensive. Land was available in remote rural areas, but that was of no purpose. Urban land at low cost was the need. The only solution was through State cost. For New Atal Awas Yojana, the Government ordered for provisions of land at a notional price of ₹.1/- per sq. feet. The registration fee and stamp duty were waived to help CGHB keep the final cost of land low. However, these orders by themselves did not make land available. It involved intense work on the part of CGHB officials at the division level. They were constantly pursued to follow-up with the District Officials for identifying suitable land, irrespective of a ready project on hand. Land status was a standing point on the agenda in all monthly meetings wherever required. The Commissioner spoke directly with the District Collectors to win his support.

Ensuring access of EWS beneficiaries to bank credit was a major issue. The target group did not possess the essential documents demanded by banks for processing a loan. Hence, a new package had to be designed. This required approval at the highest level. State Bank of India (SBI) was the only bank that shown interest in such a package. The State level head of SBI took personal interest

in the matter and successfully sold the concept to the Circle Head office and the corporate head office. Interest during moratorium period was capitalized. The instalments were fixed on flat basis. Insurance component was put in at a special nominal cost.

Design: Earlier EWS dwelling units normally had just one room. This was considered to be inhuman. Every couple has a right to privacy. Hence two rooms were fixed as the minimum norm. The poor often make functional use of open spaces. Hence open spaces were provided. The design was planned in such a manner as to allow for expansion in future if the needs of the family grow.

Result Achieved: The result achieved under each of the two schemes was very good.

Under Deendayal Awas Yojana more than 20,000 families have become owners of affordable dwelling units. For many beneficiaries it was a dream come true. Some beneficiaries resented the increase in the cost of the dwelling unit. This was largely due to time over-run in the project. The time over-run was caused by an acute shortage of building technicians (masons, etc.). The boom in housing and other construction activities had created a shortage of such manpower. CGHB therefore launched a Masons' training program in which over 2,500 masons were trained by Construction Industry Development Council (CIDC), New Delhi. The experience with banks remains mixed. Banks still are reluctant to grant housing loans to the low end segments of the market.

Land remains a matter of concern. This led to amendments in the CG Municipal Act, 1956 and CG Municipalities Act, 1961. It is now mandatory for all private builders to provide 15 per cent of raw land for EWS housing. Likewise they are required to build additional 10 per cent dwelling units for the low income group. The initiatives of CGHB under Social Housing were found significant enough by Cambridge University. It has enrolled a

candidate to research into this and draws lessons from social housing in development countries.

Sustainability: Nearly 80 per cent of the urban population in Chhattisgarh belongs to EWS/LIG. Demand for housing from low end segment is bound to continue for long. CGHB's schemes have set the trend. The sustainability of the initiatives depends upon two key factors: (a) availability of land; and (b) easy access of the LIG/EWS beneficiaries to bank-credit.

As regards land, there is new hope because the provision in CG Municipal law allowing builders to pay shelter fee in lieu of granting land for EWS housing has been deleted. They necessarily have to provide 15 per cent raw land for EWS housing at a notional price of ₹ 1/- per square foot. The Chhattisgarh Builders Association was involved at all levels in the formulation of the new law. The Association has agreed to the change in consideration of certain other concessions. They have also been persuaded to build at least 10 per cent of the dwelling units for the low income group.

As regards easy access of the LIG/EWS beneficiaries to bank-credit, CGHB on its own can do little to convince banks. An apex level intervention at the national level will be necessary in this regard.

As regards social housing in the State in general, involvement of private-sector builders in social housing is indispensable. Intense consultations and interface with private sector builders has resulted in their seeing the wisdom of altering their business plans and orienting it in favour of social housing demand. The above initiatives of CGHB are likely to be dovetailed to the proposed Rajiv Awas Yojana (RAY) for slum free India initiative of Govt. of India.

Transferability: Three other States in India have adopted/ adapted Deendayal Yojana. The scheme is easily replicable, provided the agency can find low cost land and organise access of the beneficiaries to bank credit.

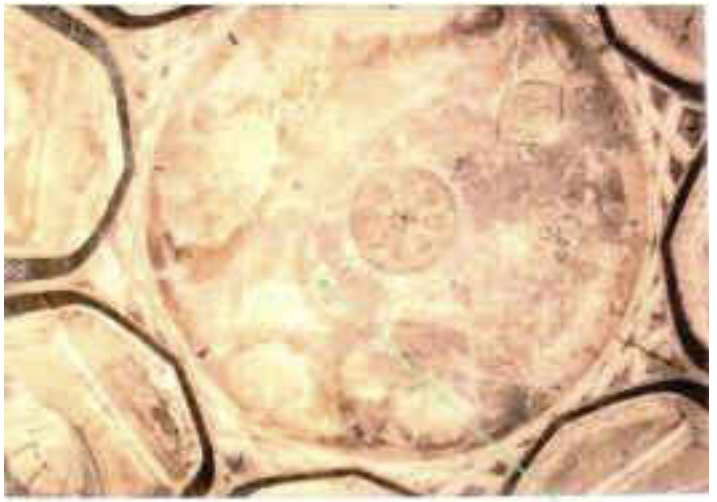
Heritage Building Conservation by Amber Development and Management Authority

Restoration of damaged East North Corner

16th Century historic Amber Place which is a protected monument of State Archaeology Department, Government of Rajasthan is like many other heritage areas of tourist interest. Amber attracts a large number of visitors, primarily because of its outstanding architectural qualities and rich historical significance. It is located on a ridge in the Aravalli range of hills. It is further enriched by the Maota Lake in the foreground. A beautifully laid garden, the Kesar Kyari, forms part of the lake. The skyline is studded with several features including the fort wall, pavilions and the Jaigarh Fort.

Situation before the Initiative Began: The Palace was in much depleted condition earlier. Approximately, 60-70 per cent area of Amber Palace was encroached upon by the local inhabitants and was being used for their personal uses and altered as per their requirements at many places. To restore the Palace, Government of Rajasthan appointed a Conservation Architect who prepared a detailed report "Amber Palace Conservation Initiative – 2005." In order to implement "Amber Palace Conservation Initiative – 2005", Government of Rajasthan established Amber Development and Management Authority (AD&MA) on 10.11.2005. The AD&MA started the conservation, restoration of Amber Palace by deputing expert technical persons, contractors in the field and the entire work was initiated as per traditional practices, materials and techniques. During past times conservation works also took place in parts by various agencies like Public Works Department (PWD) but the agencies were not having adequate knowledge of conservation work therefore the restoration work could not be effective as per traditional methods. AD&MA removed all the encroachment in year 2006-2007 and demolished all the alteration made by the occupants subsequently.

After that, major Conservation & Restoration work of Amber Palace was taken-up. Now, Amber Palace has come to its original form and all the evacuated portions have also been opened to tourists. Post restoration, the number of tourists has increased from



Before Restoration

After Restoration

11,36,224 in 2005-2006 to 13,34,030 during the year 2009-10.

Establishment of Priorities: The priorities listed in the report of "Amber Palace Conservation Initiative – 2005", are removal of unauthorised occupants from court of law and dismantling of later, additions, identification of historic layers as per archival reports, maintaining of architectural significance and quality, adoption of methodology as per traditional practice and materials, detailed damage assessment survey, repair of structural weaknesses and roof leakages. Identification of experienced engineer, contractors, and artisans etc. in the field to undertaken conservation works and maintaining cleanliness of the entire palace.

Formulation of Objectives and Strategies: The main object of conservation initiative was to conserve and restore to its past glory, movement of tourist, adequate parking, tourist facilities, art gallery, gardens, general cleanliness of the Palace, removal of unauthorised occupants, etc. To achieve the objective Government of Rajasthan established AD & MA by appointing as Chief Executive Officer a very senior Indian Administrative Services officer of the State, Conservation Engineer Director, Rajasthan Institute for Conservation Cultural Properties along with Executive Engineer and team having vast experience in conservation works. Experienced conservation architect from Ahmedabad prepared the project report "Amber Palace Conservation – 2005" as appointed consultant.

Mobilisation of Resources: Government of India, Government of Rajasthan and 2/3rd share of revenue collected from Palace were sanctioned for the project.

Process: Documentary evidence, before and after execution any conservation work, photo and video documentation was done. Restoration conservation & development work was executed conforming to historic details. Division of work was done amongst many expert agencies. Consultant Architect, Experts visited the site regularly. The site investigation was done continuously for

Before

After

further findings. Structural stability was achieved with the grouting of walls, pointing of stone walls, stitching of stone roof slabs with the help of stainless steel road etc. For good results and efficient setting time and to make good lime mortar, Gud, Guggal and Methi was boiled for seven days and this concoction was used to get the required consistency of the mortar. Stone – carving painting, plaster of paris work was given to expert master craftsmen. Extremely weathered stones were replaced with matching new pieces. All missing jaalis, railings were replaced to get back the historic ambience.

Results Achieved: The conservation initiatives of Amber Palace has enhanced its life and improved its accessibility for tourists. Facilities like adequate parking, international level cleanliness, facilities, restaurants, redeveloped historic garden, audio-guide, etc. were provided. The initiative to redevelop historic gardens, illumination of the palace, light and sound show, placing of signage has also been undertaken.

Transferability: Looking to the best practices in the Amber Palace, Government of Rajasthan allocated many other conservation projects in Jaipur such as Ghat ki Guni, Nahargarh Fort, Bihari ji Temples, Laxmi Narain Temples & Gopal Ji Temples, Panna Meena Ki Boari and Kankwadi Fort in Sariska Alwar. Façade improvement and restoration of Walled City Markets of Jaipur

have been taken up. The Sawai Mansingh Town Hall Museum at Jaipur, Sajjan Garh and Ekling Fort at Udaipur, management of Jantar Mantar world heritage site and buffer zone area of Hawa Mahal and Sawai Mansingh Town Hall areas in Jaipur have been taken up.

While doing the conservation of Amber Palace, training was also imparted in traditional building works to the masons, contractors, engineers and architects as it was felt that only few persons knew the techniques of traditional building material and methodology. Through this training, the State could get many masons, contractors, engineers and architects for conservation works.

Construction of Traffic Transit & Management Centres by Bangalore Metropolitan Transport Corporation under the category of Urban Transport

TTMC Jayanagar 4th Block,
Project Cost : ₹. 12.90 Crore , Date of Commission:31.8.2009.

Bangalore Metropolitan Transport Corporation (BMTC) formulated a "Vision Plan" under Jawaharlal Nehru National Urban Renewal Mission (JnNURM) with an outlay of ₹ 3000 crores spread over five years emphasizing development of urban transport infrastructure. The construction of Traffic Transit Management Centres (TTMCs) is part of this vision plan. TTMCs are focus on enhancing efficiency of public transport through integration of different modes of travel. BMTC identified 10 TTMCs for development under the plan. An outlay of ₹ 479 crores was sanctioned under JnNURM for these 10 TTMCs projects. These were funded with Government of India grant (35 per cent), Government of Karnataka grant (15 per cent) and BMTC contribution of 50 per cent of the project cost. All the TTMCs were made operational by 4-12-2011. Each TTMC have 34 types of passenger amenities in the categories of minimum basic passenger facilities; health related facilities; civic amenities related facilities; tax payment centers and service provider kiosks, etc.; financial related facilities; transport related facilities, bus station for bus connectivity to different places, household Requirement facilities; and park and ride facilities.

These TTMCs are located in the prime area of the Bangalore city like Jayanagar, Shanthinagar, Vijayanagar, Yashawanthapur, Koramangala, ITPL, Bannerghatta, Domlur, Kengeria and Banashankari. These buildings are state of the art passenger amenities centers. BMTC has 2,84,620 square metres built up area out of which 2,55,000 square metres can be used for commercial purpose and will generate revenue of ₹ 24 crores per annum which is a perennial source of income.

Situation Before the initiative began: This is a new initiative taken up by BMTC in order to make public transport comfortable. The Traffic Transit Management Centres emerged as the panacea for the passenger worries and

TTMC Vijayanagar, Project Cost; ₹ 58.10 crores, Completed in March 2011

fulfil the void present in public transport infrastructure systems. There was no platform for the integration of the different modes of transport.

Establishment of Priorities: BMTC formulated unique innovative TTMC projects as part of development of urban transport infrastructure to demonstrate the possible best practices in sustainable transport, wherein the public can come out from their houses in personal /public transport mode and make use of all the public amenities provided in TTMCs and again go back to their destinations. They get all their daily requirements at a single place. This will help the city to minimize congestion and also reduce the pollution hazards, thus the intervention would be eco-friendly. This system can be integrated with other modes of transportation systems like metro, mono & express rail corridors etc.

Process: The construction of TTMC work was entrusted to the agencies by floating global tenders in which reputed companies participated. The process was carried out with complete transparency. As the construction work of TTMCs was taken up within the Central Business District areas, the supply of construction material was a challenging task, and the heavy transport vehicles were used only during night time to supply the materials without hampering the smooth movement of traffic in consultation with police and local bodies. These buildings were planned at the places where already the bus stations and maintenance depots were in operations, the construction work was taken up in a phased manner without disturbing much of the operations and maintenance. The Commuters Comfort Task Force Committee and the Commuter Advisory & Facilitation Committee were consulted. These Committees are represented by the Resident Welfare Associations and Non-governmental Organisations (NGOs) involved in consumer movements. The National Building Code norms were completely adhered to. During execution of the projects, no explosives were used for digging the area. The pneumatic tools and the controlled blasting technique were used.

The hallmark of this project initiative was professional approach. M/s Infrastructure Development Enterprises of Karnataka (IDEK) was appointed as the Project consultant for the preparation of Detailed Project Report and project management services. M/s Civil Aid Techno Clinic Pvt Ltd, a unit of Tar Steel Research Foundation of India (TRFI) was appointed as third party to assess the construction work of the buildings. BMTC established the quality control laboratory at project sites and carried out the quality audit then and there. Random quality samples were selected and were sent for quality checking at M/s Civil Aid Techno Clinic Pvt Ltd. Supervision was made by Managing Director and Chief Executive Officer of BMTC along with the Functional Directors and Heads of the Department constantly. Hon'ble Minister for Transport also visited the site during execution.

Result Achieved: Amenities and facilities such as bus terminal having bus bays, platforms, seating and lighting, public conveniences, information systems, safety & security, etc. were provided. Bus maintenance was ensured through maintenance bays, washing platform, bus parking, services & utilities, fuel filling stations, amenities for the crew, etc. Passenger amenities were made available such as Automated Teller Machines (ATMs), health centre, shopping, food court, internet cafés, hygienic toilets, etc.

The projects were completed well within the time and were made operational. The most benefited are the passengers who were earlier waiting for the buses on the road. They are now made to wait in the modern bus station with the above said facilities. This has reduced the traffic congestion, accidents and anxiety among the passengers. There was creation of additional revenue to the BMTC which is perennial in nature and makes good of the marginal loss caused due to increase in the cost of operation. The economic activities became brisk in and around the TTMC areas.

Sustainability: The TTMCs are the passenger amenity centres established for the benefits of passengers under this project. These are also known as the elements of transport infrastructure. The TTMCs emerge as the important transport hubs to increase the ridership for the BMTC and are the perennial source of revenue helping in the financial sustainability of the BMTC. The park and ride facilities encouraged the people to use the public transport. The opening of various Government and corporate offices brought the services to the door step of the people. The centres are the meeting places of all categories of people. The aesthetic look of the building, seating arrangements, passenger information system, spic and span condition of the premises, improved signage and disciplined arrival and departure platforms avoid confusion in availing the public transport service. The multilevel park and ride facilities are much appreciated everywhere. The main objective of this project is to assist in the environmental conservation by way of reducing the personal mode of vehicles thereby save the petroleum products for the nation.

Transferability: The construction of TTMCs is a pioneering work of BMTC in the field of transport infrastructure development under the joint funding under JnNURM by Govt. of India and Govt. of Karnataka. The Officers of BMTC have done a commendable job in finishing the construction work of these centres on time and this experience was shared with other professionals visiting BMTC. The Government of India with this experience extended the schemes elsewhere in the country. The neighbouring transport corporations of Karnataka got

funding under various Karnataka State Government schemes for transport infrastructure development schemes. The Officers from other state transport corporations of India visited BMTC to share the idea of developing the transport infrastructure in their corporations. The representatives of World Bank, Asian Development Bank and academic institutions visited BMTC to share the knowledge to implement the same in their places. The State and Central Governments can take up such projects to popularize the public transport in Metropolitan and two tier cities.

Overall City Development Initiatives by Thane Municipal Corporation

Urban Solar Planning, Reduction in Electricity Consumption

Solar Parabolas as part of Air Conditioning System

India is facing an acute energy scarcity and there are various constraints in mobilizing resources in setting up of new power plants which is hampering its rapid industrial growth and economic progress. Thus, it is essential to tackle the energy crisis through implementing energy efficiency measures and judicious utilization of abundantly available renewable energy resources, such as solar energy, wind energy, biomass energy etc. Apart from augmenting the energy supply, renewable resources will help India in mitigating climate change.

Thane Municipal Corporation (TMC) has undertaken various initiatives in the field of energy efficiency, renewable energy and urban solar planning and therefore, Government of India has selected Thane as a "Solar City". TMC has already prepared sector wise energy status report and Green House Gas (GHG) inventory and published it on the Corporation's website. Under the solar city programme, Thane Municipal Corporation has initiated Energy Efficiency (EE) and Renewable Energy (RE) measures from the year 2000-01 onwards and is pioneer in Energy Efficiency and Renewable Energy (clean energy) project implementation in Municipal sector.

Prior to the year 2001, there was no awareness about importance of Energy Efficiency and Renewable Energy in municipal services. The electricity bill of street lighting and municipal buildings was to the tune of ₹ 10.2 crores during the financial year 2000-01.

EE and RE projects in Municipal services involved in house Engineers studying the connected load, its operating hours, diversity, factors to find out the actual energy consumption and cross checking the same with Maharashtra State Electricity Distribution Co. Ltd (MSEDCL) bills. Energy conservation was aimed through creating awareness among the citizens and through the use of cost effective energy saving measures and projects e.g. microprocessor timers for street lighting, energy efficient tube lights, fans, solar water heating systems etc. Energy audit of electrical installations was conducted through qualified in house engineers and Bureau of Energy Efficiency (BEE) accredited energy auditor. Policy

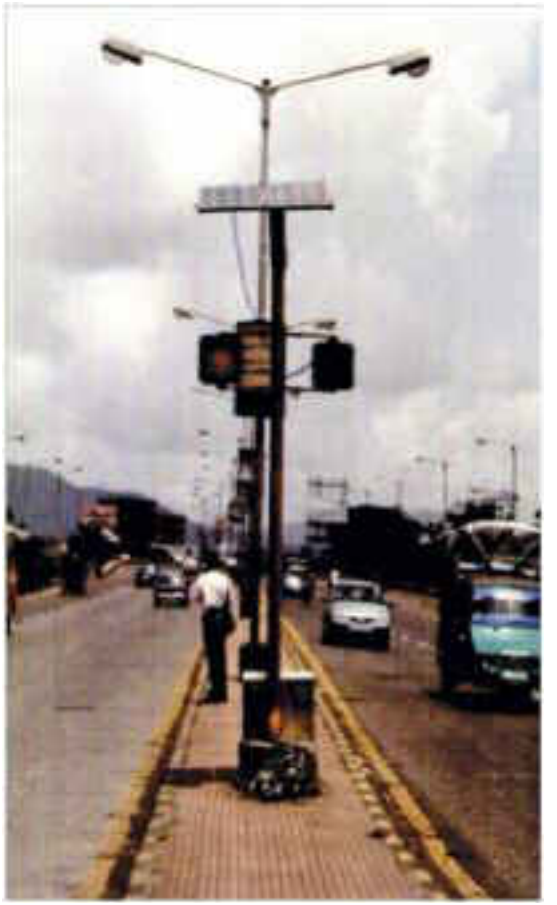
initiatives and Master Plan for entire Thane city included amendment of building permission rules whereby provision of solar water heating system has been made mandatory for all category of new buildings with effect from 23.09.2005. In residential buildings, TMC offers 10 per cent rebate in property tax, on installation of solar water heating systems. Under solar city programme, master plan has been prepared for identifying objects and targets for reducing 10 per cent in energy consumption. The Ministry of New and Renewable Energy (MNRE), Government of India's Solar City Program aims at minimum 10 per cent reduction in projected demand of conventional energy of entire Thane city at the end of five years. TMC has set benchmark for 15 to 30 per cent reduction in energy consumption of Municipal buildings and street lighting and 100 per cent coverage of solar water heater system for all municipal buildings having requirement of hot water.

Mobilization of resources: TMC has undertaken all these projects through own budgetary provisions. For solar initiatives, TMC received around 30 per cent grant from Ministry of New & Renewable Energy, Govt. of India. The technical details and tender papers were prepared by TMC engineers. The work was awarded to lowest bidder. The successful bidder has provided all skilled and unskilled manpower and materials for execution of projects. For Solar City Master Plan, the cost was funded by MNRE. Under solar city programme, MNRE has sanctioned ₹ 50 lacs for undertaking various activities.

Results Achieved

Urban Solar Planning: As a result of amendment in building permission rules and rebate in property tax, more than 9 lac litres per day capacity solar water heating systems have been installed by developers / owners of tenements which benefit the citizens of Thane. TMC has installed 36,000 litres per day capacity solar water heating systems on its own buildings which benefits employees and citizens. Solar City Master Plan has been prepared after conducting extensive surveys and deliberations in city stakeholder committee meetings. The master plan has been finalized at city level. This will benefit entire citizens of Thane and contribute in mitigation of GHG emissions from the city.

Clean energy production: 50KWp Solar Photo Voltaic System has been established for main administrative building with generation of 65,000 units of electricity per annum. 36,000 litres per day capacity solar water heating systems have been installed on various municipal buildings. 145 Solar Garden Lights have been installed. 80 T capacity solar air conditioning has been provided for



Solar Blinker for Road Traffic

Result of Energy conservation for Municipal street lighting (Units in lacs)		Result of Energy conservation for Municipal Buildings : (Units in lacs)		Result of Energy conservation for C.S.M. municipal Hospital (Units in lacs)	
Total connected load(KW)	6387	Total connected load (KW)	3270	Total connected load (KW)	1310
Units calculated for 12 hrs burning per month	22.99	Units calculated for (8 hrs) burning DF =0.7	4.39	Monthly Units calculated	3.03
Benchmark – 30% energy saving	16.09	Benchmark – 15% energy saving	3.74	Benchmark – 25% energy saving	2.27
Actual average unit consumption per month	16.47	Actual average unit consumption per month	2.41	Actual bill received	1.33
Actual saving %	**28.37%**	**Actual saving %**	**45.16%**	**Actual saving %**	**56.15%**

municipal hospital. 15 T capacity bio-methanisation plant has been established which generates electricity used for municipal hospital.

Bio Methanisation Plant

All these initiatives were aimed at achieving sustainable development of Thane city. There is participation of TMC employees, elected representatives, citizens, NGOs active in the city and other stake holders. Energy Efficiency and Renewable Energy projects undertaken by TMC were cost effective and sustainable. The payback period of solar water heating system is 3 years and the design life of the same is 20 years. In case of street lighting energy conservation project, the payback period was less than two months.

All the Energy Efficiency and Renewable Energy projects are replicable by other municipal corporations/ private organizations. After the installation of 15 T capacity bio-methanisation plant, one private housing complex, Hiranandani Estate opted for 5 T capacity bio-methanisation plant for treating biodegradable waste generated in their complex. After the installation of first solar water heating system by TMC in the year 2003, many private residents / developers visited the site and decided to install solar water heating system. The amendments in building permission rules made by TMC in respect of solar water heating system was replicated by other Municipal Corporations.

JNNURM - BSUP project in Thane for Housing the Urban Poor

As an important urban agglomeration of Maharashtra State, city of Thane has witnessed huge population growth in recent past. This had entailed TMC to execute Basic Services for Urban Poor (hereafter BSUP) programme aimed to facilitate and promote the economic growth of the city with special emphasis on environment of the city.

The process started with in-house preparation of City Development Plan through comprehensive conceptualization and thorough consultation with all the citizens and stakeholders. As a part of the First Phase of this programme, TMC has prepared Detailed Project Report (DPR–I) for redevelopment of 9 slums covering 9426 slum dwellers with project cost of ₹ 337.55 crores. So far TMC has started work in four slums and five are in pipeline. 785 units are completed and handed over to beneficiaries along with community infrastructure and services in June 2011. TMC has also prepared DPR-II for relocation of people affected in road widening or Nallah projects. 822 dwelling units with project cost of ₹ 34.42 crores are constructed. Beneficiaries' allocations in these units are in process. The titles of the tenements are transferred in the name of the respective slum dweller with wife as co-owner granting them security of tenure in the fulfilment of reform agenda. The housing units have improved design as it consists of one bed room, hall & kitchen, water closet (WC), bath and balcony in 25 square metres of carpet area.

As part of reforms, out of total budget of ₹ 2158.87 crores, ₹ 644.30 crores earmarked for urban poor. Resolution is passed for earmarking 25 per cent of developed land in all housing projects for EWS/LIG categories. The basic services of water supply, sanitation, education, health, social security are also achieved through the project.

As per 2001 census, there were 211 slums catering to housing needs of 5.49 lacs slum dwellers (35 per cent). Prior to BSUP, TMC was implementing slum and settlement upgrading, improvement and redevelopment programme chiefly through Slum Redevelopment Scheme (SRD). The pitfalls of SRD scheme were eviction of post 1995 population, no provision of amenities like community halls, night shelters, no reform mandates and lengthy techno legal procedures.

Through JNNURM project, TMC has been instrumental in facilitating housing along with integration of service delivery system i.e. integrating asset creation with asset management and financing during its life span so that the intended services will be fully sustainable. TMC has prepared DPR with the basic objective of implementing a holistic slum development by providing adequate shelter and basic infrastructure facilities to

slum dwellers. The other objectives of the project are provision of affordable, safe, self-owned & adequate shelter to urban poor, upliftment of living conditions of urban poor, enhancement of ecological balance and environmental parameters of the city, creation of housing stock in the city, improvement the inequalities & creation of better opportunities to urban poor and elimination of danger of natural events such as flooding, co ownership of women.

The funding pattern of BSUP project is four layered – Government of India contributes 50 per cent, Government of Maharashtra contributes 25 per cent, TMC has 9 per cent of contribution and rest 10-12 per cent is accumulated from beneficiaries. TMC has also promoted various forms of private sector participation through public private partnership. The corporation also uses land instruments like Transfer of Development Rights (TDR), Floor Space Index (FSI) for funding viability gap.

On technical front, expertise was accrued through esteemed and knowledgeable architects, project execution consultancies, RCC consultants separately for each project component for better project management and quality control. However whole project was monitored through excellent expertise of in house engineers.

The project started in 2006 with a target of 10,248 units. Under the basic premise of community involvement, TMC has emphasized a lot on stakeholder consultation processes. Various meetings were organized at project selected slums consisting of large samples of residents representing different sections of society (urban poor, government officials, public representatives). The most favoured model was in-situ however shifting people temporarily was an area of concern. Hence people were given options of transit accommodation or monthly rent support of ₹ 1500. The level of trust was so high that slum dwellers cooperated during demolitions and process was carried out without issuing any legal notice. Throughout the implementation stage, social dialogues were done by BSUP cell so that people are abreast with development. During the beginning of the project, all the beneficiaries were surveyed, their documents were verified as per the norms and data collected was updated in software designed to generate reports. These software records were checked and updated before lottery and house allocation process. The lottery events are additionally used as mela to explain about social welfare schemes as well groom leadership for enhanced community participation.

Results Achieved: Over 2500 Smart Cards are issued to all the BSUP beneficiaries that contains the household and socioeconomic

information as well photographs and thumb impressions of both husband and wife as co-owners. This acts as valid identity card. The smart cards were imperative in collecting beneficiaries share and so far over ₹ three crores are generated from beneficiaries as their share.

Currently 7 buildings are occupied and 14 are in process. Every building has its society and all the affairs are handled by the committee. The buildings have lift, fire fighting system, rain water harvesting and solar water heating system. The BSUP cell conducted social audit before allocating units to the recipients. The allocated buildings are regularly visited by officials and NGO personnel. The society members are contacted frequently till the community takes over operation and maintenance responsibilities fully. The house unit is allocated to a beneficiary after his/her share of contribution is paid. TMC carried dialogue with Bank of Maharashtra who agreed to lend BSUP beneficiaries who were unable to contribute their share.

TMC has already completed reforms pertaining to the provision of basic services to urban poor particularly water supply, community toilets, dispensaries, health centres, schools, balwadis, crèches, roads, house to house solid waste management services etc. TMC presently supplies water to the residents through 3,95,971 connections and water supply network covers 99 per cent geographical area of the Corporation. At present 85 per cent of solid waste is collected through door-to-door collection system. Rest is covered through Ghanta Gaadi. Presently all the slum pockets are covered by storm water drains which ultimately connects to the Nallas. During BSUP execution, TMC has prepared a separate 'P' budget for the urban poor and allocated budgetary provisions under the category of 'Poverty alleviation' through execution of various functions for the urban poor.

The Corporation has proposed to constitute a revolving fund exclusively for incurring the maintenance cost of the utilities provided.

The Corporation is using local materials for the construction of buildings The use of ready mix concrete is promoted as to control pollution and for speedy progress. The construction sites are barricaded with 16 feet aluminium sheets which help in controlling the spread of dust.

Conclusion: The procedures, tools and methods used were shared with nearby Corporations in Maha Mumbai Metropolitan Region. TMC's software for beneficiaries' record and report generation are also prototyped by some Corporations for their internal use. The customized software adopted for lottery that is designed to allocate units as per guidelines is also replicable by other Corporations.

Urban Research Centre, Thane for Better Urban Management and Administration

In order to provide city spatial information for urban planning and for decision making to promote modern Urban Infrastructure Management, Thane Municipal Corporation (TMC) has taken initiative to start an Urban Research Centre in a new building located at the heart of the city. The centre has been started with the intention of providing a base for research in the field of Urban Development and Capacity Building in all sectors of development administration. It shall act as a resource centre for policy makers, researchers, city planners, architects and shall help in more efficient city development. It is the first centre of its kind taken up by an urban local body in India.

The centre will help people in developing these themes into study plans, further studying these plans through intensive discussions and implementing the finalised programmes, by making effective use of the educational and training schemes provided by the centre, including the citizen researcher programme, researcher support programme for young researchers and short term researcher programme. The Centre will carry out network building with citizens, NGOs, business people and urban planning consultants who will work closely with communities in Thane, Maha Mumbai Metropolitan Region and India, as well as university affiliated researchers and opinion leaders. The practical studies and research will help in drawing out proposals for the formulation of sound urban policies.

Prior Situation : Lack of professionalism and knowledge about the best practices and appropriate technologies in the field of urban development were resulting in inefficient city management. Need for Centre was felt which would commit itself to the local community together with citizens, businesses, public administration, universities and NGOs and seriously consider what is necessary today for the betterment of the city of Thane and disseminating the information to the various stakeholders and partners. The Centre was thus established with the vision to improve the city functioning and quality of life of the citizens by increasing the competence and knowledge of city management and urban development.

The Project: The URCT was initiated under the PPP model where entire cost of the construction (₹ 2 crores) was borne by the Developer against the benefit of Transfer of Development Rights (TDR) for the built up area of 2108.96 square metres. This model could also be replicated by other cities. TMC has made provision of ₹ 100 lacs for books and other expenditure. Further funds could be generated through foundation membership grants, research grants, workshop and seminar fees and Govt. of India grants.

Results achieved: URCT has been established and shall help in a long way to develop an integrated approach towards city development and shall be able to establish more efficient city managers.

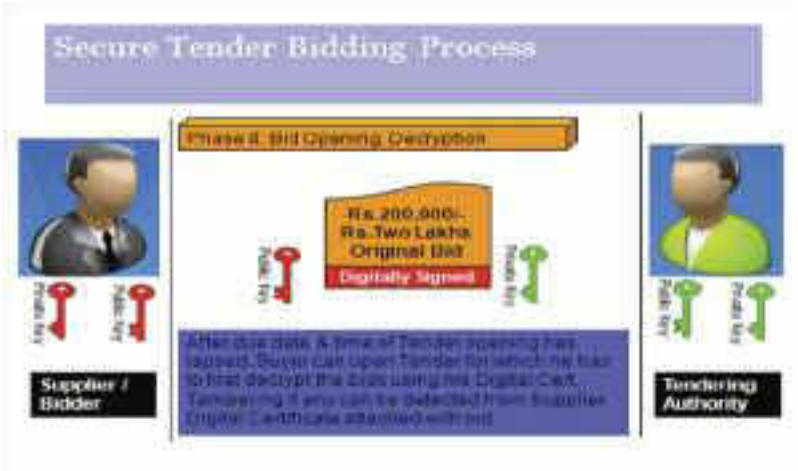
E Governance Initiatives for Thane City- GIS Based Administration, E-Tendering Procurement and Online Building Plan Approval

Thane Municipal Corporation (TMC) is responsible for planning, development, repairs, operation & maintenance of services and utilities within its area of jurisdiction, which includes socio-physical & environmental infrastructure facilities. TMC envisages implementing Enterprise Geographical Information System (GIS) to enhance the services and establish better management control. TMC has also initiated the e-tendering process to achieve automated tender process and to have global participation, security and transparency in the complete process. The Online Building Plan Approval portal is a complete online web enabled portal with intention to bring complete transparency through e-governance in the working of town planning department of TMC.

Capturing of GIS Layers from Satellite

Situation Before the initiative Began: Before acceptance of GIS based administration in TMC, all departments were working as individual identity, using traditional mapping methods and semi-automated computerized systems. There were no integrated databases to support decision making at administrative level. The process of tendering was lengthy and time consuming. Fewer bids were received. Bids were limited to local areas, the process was expensive, tedious and security was a threat. It was prone to manipulations and errors and was inconvenient for the tenderer.

The Initiative: Through the GIS Based Administration 1:1000 scale mapping of the entire city of Thane has been achieved by using High Resolution Satellite Imagery which provides current ground realities. All the layers required for Municipal administration are geo-reference on the base maps and a common geo-database is created. Decision making process is enhanced due to access of information with location based intelligence in day to day and every aspect of Municipal Administration. Enterprise level GIS application with user friendly interface



available on the browser makes GIS as a common operating picture for the organization. Real time updating of spatial and non-spatial data is possible through web based and mobile based application interfaces. Inauguration of E-Portal was done on 13/06/2011.

Results Achieved: E-Tendering Procurement has achieved automated and fast process, higher & global participation. It is economical, security is fool proof. It is an accurate and trusted process offering convenience to buyer and supplier. TMC has saved ₹ 4.09 crores. on account of newspaper advertisements and printing of tender document since implementing of e-tendering. Online Building Plan Approval System has provided an online forum for any query to Thane Municipal Corporation's Town Development Department (TMC-TDO) and Do's and Don'ts for citizens while buying house of flat in any scheme. It protects projects buyers from buying unauthorized/ unsanctioned houses, citizens can be a part of forum where they can share their views, complaints and suggestions with the Department.

TMC officers can generate at a glance picture of the Entire city or Prabhag samiti or ward wise for the collection of property tax. This helps to undertake missions and priority management and also do the defaulters analysis, automated Information management processes with minimum human interventions to build an efficient, self-driven structure, thereby allowing TMC officials enough time to focus on core, strategic activities. Powerful geo-information analytics supports efficient government services, planning and administration, allows single version of truth to ensure continuous, real time access to the most current and authenticated property information. Advanced reporting capabilities enables better and faster decision making. Consolidated geo-data repository integrates information from all departments across all formats.

Sustainability: With the ever increasing demand for better facilities and amenities, it is critical for government to employ transparent information systems that provides citizens, government and the various stakeholders with easy access to accurate and authenticated planning information, thereby building a robust structure for efficient development and growth of the city.

Transferability: TMC is extending GIS functionalities for Citizen Request and Services Management, Disaster Management, Public Transportation Management, Solid Waste Management, Public Health Management, Water and Waste Water management and Slum-free city planning and rehabilitation. TMC model can be re-implemented through a special purpose vehicle (SPV) established by TMC and Cybertech to extend the benefits and power of GIS to other local bodies.

Rain Water Harvesting Initiatives

Thane experiences at least average 100 days of rainfall, per year resulting in at least 3163 mm of rainfall per year. However, percolation of water in the ground has reduced because of excessive construction of non-permeable surfaces. Each day the ground water table is depleting causing shortage of water supply. A large amount of usable rain water drains away and causes flooding hazard. Fresh water from lakes is diminishing fast because of excessive evaporation as a result of global warming. Therefore ground water table need to be refurbished with the use of rain water harvesting in Thane and surrounding areas.

Process: Around 450 million liters of pure water per day is being supplied to the whole of Thane corporation region, of which 60 percent is being used by residential buildings. Out of a total population of 20 lacs, around 55,000 populations is occupying buildings constructed after 2005 wherein the rain water harvesting project has been made mandatory, thereby 2.4 million liters of water per day has been conserved by means of these compulsory rain water harvesting projects. Challenges in implementation are of two primary forms, Government norms and cost of implementation to devise effective techniques and maintenance costs which most housing societies and commercial complexes in the city are reluctant to implement because it need large area of open space and creation of storage facility. At the same time, because of the efforts of TMC to make rain water harvesting mandatory many successful projects have emerged and are working satisfactorily.

Formulation of objectives and strategies: Looking at the topography of Thane, it was essential that salt water which used to contaminate the water table had to be contained and this important function has been well fulfilled by the implementation of rain water harvesting projects across the city. Strategic locations in the city were identified to construct artificial lake like a deep pit to allow rain water to collect in this lake. Also holding ponds are being dug up and during the high tide the water will be arrested in these ponds. The rain water will also be arrested and allowed to percolate in the ground.

Achievement: Rain water harvesting projects have been implemented in all buildings in Thane which have been constructed after 2005, as per the directives of Urban Development and Development rules made by Thane Municipal Corporation. The rain water harvesting has been done in approximately 343 buildings in Thane. This helps for arresting flow of running rain water which flows away through terraces. This rain water is diverted after filtration into a recharge well or recharge pit and recharge trenches which is constructed in each and every building. Around 60 percent of flowing water can be harvested by means of this

Saptashree Developers, Wagle Estate, Thane incorporates Rain Water Harvesting

Shaheed Hemant Karkare Garden, Thane Municipal Corporation

effort. Apart from this, 12 Municipal office buildings have also been provided with rain water harvesting scheme.

In Sandoz company complex, artificial lake allows rain water to be filled and percolated underground, which has raised the underground water table effectively. In another case study of Lodha developers involving 10 stories of office space with nearly 1,000 employees, they have built an underground water storage tank of over 3 lakh liters, which is filled using rain water which can hold their whole year's requirement of water. As a result TMC does not have to supply any water to this complex at all. Cosmos Lawns Housing society when rain water harvesting project was undertaken, and bore well was made and water has been used for washing, water recycled through sewerage treatment plants has been used for gardening, car washing, society compound maintenance and also refilled in flush tanks. Water drawn from rainwater harvesting, filtered with Reverse Osmosis filters is used in houses for washing purposes. So the TMC supply of pure water is only about 15 to 20 liters of water per day per person, which results in nearly 80 percent of water saving due to rain water harvesting. In Hiranandani project in Thane, Reverse Osmosis filters have been installed for filtering bore well water, which has been recycled for washing and bathing purposes, resulting in saving of TMC supply of pure water up to 60 percent. As a result of all such efforts nearly 5 ML (million liters) of water per day has been saved.

Sustainability: Financial resources as investment is being done by builders and is recovered from buyers therefore TMC does not have any financial liability whatsoever. Whatever projects have been implement so far are running successfully and inhabitants of Thane are truly evolving into an environment conscious populace.

Thane is becoming more and more self-reliant when it comes to use and supply of water and all users in this region are benefitted with 24 x 7 supply of water, at a reduced cost, limiting energy usage and with better force. This is surely affecting the overall quality of life of Thaneites very positively.

Transferability: TMC personnel have undertaken training from Administrative Staff College of India as a result of which they have gathered good technical expertise on the subject. This knowledge has been transferred to the masses of Thane by means of attractive floats run on the occasion of Gudi Padva (Indian New Year) as well as through widely circulated pamphlets and other means of free and low cost publicity. Increased awareness among Thaneites has resulted in them asking the builders and developers whether they have a good rain water harvesting system along with bore well in place. This is being looked upon as an added facility for the buyers and sellers of real estate which is a positive sign for water conservation.

Green Accounting, Urban Greening and Pollution Reduction in the City of Thane

Harit Janpath

Thane, in Maharashtra is one of the fastest growing cities adjoining the financial capital of India i.e. Mumbai. It is seeing heavy urbanization, growing population and rising demands on infrastructure. The city is facing huge environmental problems since last decade which is directly affecting the health of the citizens of Thane city. Since last five years TMC has taken various initiatives to protect the environment of Thane city through environmental green initiatives. TMC has taken these various initiatives to reduce the pollution in the city in coordination with Maharashtra Pollution Control Board.

Green Accounting: The green initiative includes various measures including green accounting which includes finding out the number of trees in individual wards in government as well as private property, collecting information on medicinal, aesthetically, socially and culturally significant species, establishing botanical name, English name as well as local name of each species, providing detailed information and colored photographs of endangered tree species, if any, and determining measures for their conservation and suggesting tree species according to surrounding conditions for developing green belt in future. Tree census is conducted which includes study report of tree plantation in last three years and data regarding existing green cover. Tree carbon sequestration potential can be estimated using this tree census data. Subsequently, carbon neutrality can be achieved by bridging the gap with the city's emission profile.

Urban Greenery: The Thane Municipal Corporation comprises of 128 Sq.km area out of which 62 Sq.km is declared as 'Non Development/Green Zone' due to geographical structure of Thane City. Thane city is also recognized as "The City of Lake". "Green Thane Project" has been introduced which involves massive greening programme, plantation of big grown up trees, shrubs, bushes, plants, lawns, flowering plants etc. It is also conceptualized that particular streets are given specific identity by planting specific trees, flowering plants or similar coloured flowers. The objectives are to increase the area of "Green Zone" of the Thane City through planting greenery, to develop Green Walls at the junctions of Express High-way and main roads so as to protect from air and noise pollution; to develop major existing gardens with new conceptual planning; to develop new gardens; to beautify existing road dividers with uniform concept by planting greenery, to give tree identity for road by planting special varieties of trees; to maintain existing and newly developed gardens, road divider, road side plantation in proper manner and to beautify area around the Lake by planting flowering and avenue trees.

Harit Janpath Project: The main purpose of this initiative is to give user friendly as well as eco-friendly footpaths and walkways to the city of Thane.

Situation before the initiative began: Before TMC took the initiative to collect tree

information using Global Positioning Survey (GPS) method from the ground including detailed information of each individual tree, the situation was such that the TMC database was relying on the information given by the individual residents. This was gradually destroying the trees including rare species. Footpaths, the basic need of a pedestrian were very narrow and not user friendly because of which pedestrians preferred to walk on the roads resulting in traffic snarls as well as accidents. Taking stock of the increasing pollution, decision was taken for development of green zones under the TMC area.

Lake Conservation

Strategy : First step toward the tree census / green accounting was to confirm the definition of the Tree i.e. which plant should be called as tree and could be considered as tree under green accounting. Tree Inventory means counting of trees which have woody stem or trunk with a minimum girth of 10 cm and height of more than 4 feet from the ground level. Environment & Biotechnology Foundation (ENBITECH) has a knowledge bank of more than 600 plant species. Each and every plant species is identified, counted & recorded with Latitude/ Longitude value of that plant. If field officer finds new species, he brings back taxonomically identifiable parts of that plant to office and confirms it with senior taxonomists or through books and journals. The knowledge is updated in the knowledge bank. Counting of trees is done area wise. Tree location and ownership of land is classified as i.e. government, private, industry, road side, or any other premises and; health status of tree is classified. Tree Census Report is then prepared with count of trees and Tabular representation of each and every tree is drafted with detailed observations including remarks or recommendations for plantation. TMC has established an advance GIS system for the tree census data identification.

The footpaths rather "HARIT JANPATH" should have at least 2.25 m to 3.0 m wide surface area for walking, having effective drainage arrangement with respect to the road and surrounding properties, provide safety from vehicular road traffic, constructed in terms of durability, equipped with good lightening arrangements such as street poles and wherever possible pockets of lawns or decorative shrubs to help make it user friendly as well as eco-friendly so that citizens of the city should use " HARIT JANPATH " to a maximum. This promotes the most ecofriendly mode of transport i.e. walking.

In urban areas lakes are a source of clean air. In Thane there are 35 small and medium sized lakes which are surrounded by dense residential area. These lakes are used as recreation areas. To improve the water quality and surrounding area, the Corporation initiated the Bioremediation programme. For ensuring percolation of water construction of dry rubble wall was used instead of RCC retaining walls. Wetland vegetation was introduced for natural purification of water, jogging track was constructed in surrounding area, attractive fountains add

Awareness Programme

beauty and erstwhile isolated well was developed for Ganapati idol immersion. Thane Municipal Corporation approved a consultant to study the physiography of lake & lake area. Accordingly Thane Municipal Corporation has carried out Lake Beautification programme phase wise. In Phase 1, TMC initiated beautification of lakes which are in dense residential areas.

Results Achieved: Thane Municipal Corporation completed its first tree census in year 2002 in which total 331500 trees of 297 species were counted.

Tree Census helps in inventory-facilitated management activities like - tree risk management, tree health management, species diversity management, maintenance needs assessment and prioritization. Now, the Corporation is having a digital tree census data on GIS platform and the same is analyzed by the Corporation's Tree Department. TMC is now in a position to identify the tree location and its attributes in a precise manner. It has outsourced works of greening and conservation of lakes for a stretch for five years, which is appropriate period for growth of trees and the greenery of the city.

Transferability: Such mass plantation, beautification of dividers and Janpath project creating wide and green path way for pedestrians are easily adoptable measures by other corporations as well as private organizations through public participation and awareness.

Kankaria Lake Redevelopment and Sabarmati Riverfront Redevelopment under the category Environmental Management by Ahmedabad Municipal Corporation

The Ahmedabad Municipal Corporation was felicitated with an award for its initiatives under environmental management for Kankaria Lake and Sabarmati Riverfront Redevelopment projects.

The Kankaria Lake Redevelopment Project

The historical Kankaria Lake is situated nearly at the centre of Ahmedabad city. It is having a periphery of about 2.5 Km and has been the symbol of Ahmadabad's identity since almost 500 years. The historic lake around an island garden called Naginawadi has been an evergreen outing place for the people of Ahmedabad. Along with the adjoining Zoo, Balvatika, Aquarium and surrounding hill gardens, it offers a complete entertainment centre. With an expanse of around 4 sq km of water body, it has acted as the lungs of the relatively lower income south-eastern part of the city.

Situation before the initiative began: Kankaria was visited by hundreds of visitors and was an urban chaos characterized by unclean Ghats, traffic chaos on the 2.4 miles periphery road, unorganized street life including a congested eating area on one corner thriving with street food vendors. The periphery wall was in a dilapidated state, and lake precincts presented somewhat unclean

and disorganized environment. Vehicle parking along the periphery walls often blocked the view, and visiting children had a hard time amidst the noise, traffic and resultant chaos. Kankaria had also gained notoriety as a suicide point. The water in the lake was unhygienic due to drainage run offs and dumping of waste.

Establishment of Priorities: The project for redevelopment of the lake and its precincts was taken up by AMC in 2006 and completed in December 2008. The objectives of the project were upgradation of environment surrounding the lake through a comprehensive and organized lakefront development project, converting it into an international quality urban public space for recreation and leisure showcasing Indian culture and lifestyle, provision of high quality resource and asset management given that the lake represented a source of aquifer recharging water and air for the environment in the area.

Main features of project: The entire lakefront areas have been pedestrianized with access to lakefront area through three entrance plazas and two other entrances. A 2.25 km long continuous pedestrian promenade made of grey granite was constructed around the periphery of the lake. A 2 m wide bicycle track along the periphery was also added. The highlight of the development was provision of a 42 m long mini toy train. The train operates around the periphery giving a joyride. Provision was made for creation of a handicrafts market to provide experience of shopping for traditional items of Gujarat to visitors. Green space was enhanced by creation of two linear parks 200 m wide one on each side. This provided the necessary open space for recreational activities. The project also included construction of new public toilets supported by overhead tanks. Clean water treated by an in-house reverse osmosis plant supplied drinking water to visitors free of cost. The development of the lakefront was planned with facilities like food courts, walkways, linear gardens and landscapes and musical fountains.

Strategies adopted/mode of transformation with details of role of various stakeholders: AMC adopted a model of service delivery of various recreational activities through in-house planning and capacity building combined with use of capable and experienced private

sector players in a phased manner. The Recreation activities like Atal Express Train, Zoo, Balvatika, Naginawadi- Ultra Fast Musical Fountain with multi-colour Laser Show, Water Sports- Boating, Amusement Park, Glider Ride at One Tree Hill Garden, etc. were conceptualised, planned and developed by AMC and thereafter the service delivery was ensured through comprehensive Operations and Maintenance contracts. Another feature was accommodation of the 45 project affected food vendors within the redevelopment by providing three cluster areas for them in an organised manner. The food stalls were reconstructed as per uniform design specified by AMC. The stalls were given individual Compressed Natural Gas connection, electricity with private meters, and water facility. Each stall was given space in the front of the stall for laying tables. Food stall Vendors were given training for Hotel Management and Service Delivery Systems at Institute of Hotel Management. They were also assisted in getting a subsidised financial support upto ₹ 2 lakh from Banks. The design also provided for branded food stalls, which is presently occupied by an international food retail chains outlet.

Results Achieved: The project was completed in 2008 at the cost of ₹ 36 crore within a period of 18 months. The lake was transformed into a comprehensive high quality environment zone providing a healthy environment. The Corporation resolved to charge the entry to cover the maintenance expenses at the premises. The response from the citizens has been overwhelming.

During last one year more than 1.18 crore visitors have enjoyed the ambience of the transformed Kankaria Lake Front (70 lacs visitors during weekdays since operation-alization and 48 lakh people participated during the Kankaria Carnivals of 2008 and 2009). More over 12.5 lacs visitors and children have taken the joyride of mini train – 'Atal Express'. Moreover every day during morning hours, approximately 7,500 health conscious citizens living in the nearby area of

Larri Clusters At Regular Intervals

Kankaria Lake Front regularly visit for Jogging (without being charged entry fee) from 4 am to 8 am. Festivals, small gatherings, educational tours, jogging, informal meetings, picnics etc. have become new face of Kankaria to attract younger generation in a meaningful way. Further, the Lake is emerging as a platform for creative expressions of different communities of artists. Programs like ultrafast laser show with sound, fireworks and musical nights are attracting tourists from other cities and states. A week long Kankaria Carnival has become an annual event for the state of Gujarat.

Sustainability of the initiative : As a result of the project, a chaotic spot has been converted into a high quality environmental zone with benefits at the physical, organizational and societal level. The improvement in environment at this public place has been noticed to have improved by monifolds. The place is very clean and always thronged by visitors. The ecology of the place has attracted many new species of birds for breeding. The water in the lake has been completely cleaned owing to stoppage of sewerage water draining into the lake as well as disposal of waste into the lake. The major source of water now for the lake is rainwater runoff. The continuous presence of clean water in the lake has helped in the recharging of the ground water in the vicinities, limiting energy use. The project demonstrated a useful model for incorporation of project affected people like the food vendors into the project. The project provided opportunities to launch city level and state level events that see participation from all communities and strata. The capability of the initiative to recover its own maintenance expenses is contributing strongly to self-sustainability and is a motivating factor for further improvements. Further, AMC has outsourced several activities like housekeeping, operations & maintenance and security to qualified private sector parties through ensuring transparent bidding processes backed by detailed contracts to appoint, and manage the operators.

Sabarmati Riverfront Development Project

The Sabarmati Riverfront Development Project (SRDP) is a city level intervention in urban planning and design, which seeks to return some of the advantages of the waterfront, as well as add new ones by renewing the riverfront area and restoring it to its historical place in the lives of the citizens. It is seen as a high impact intervention, unique in India in terms of scale and innovation. The estimated project cost is ₹ 1152 crore including construction cost, design and supervision charges, interest during construction, overheads etc. About ₹ 850 crore have already been spent on the project out of the estimated ₹ 1152 crore. HUDCO has sanctioned a term loan for the project. The balance project financing needs are being met through the equity support from the Ahmedabad Municipal Corporation. The Project is an urban renewal project to improve the spatial structure and habitat conditions of the river and adjoining areas. It aims to transform Ahmeadabad's historic yet neglected river into a vibrant and vital focus for the city. In 1997, the Sabarmati Riverfront Development Corporation Ltd. (SRFDCL) was formed by the Ahmedabad Municipal Corporation and construction began in 2004. The development project encompasses both banks of the Sabarmati for an 11.5 kms stretch, creating approximately 202 hectares of reclaimed land.

The Vasna Barrage at one end of the Waterfront acts as a dam for release of water from the Narmada Canal, making it possible to store water in the river and to enable creation of a public waterfront. The project includes water management systems to minimize flooding in traditionally flood-prone areas and to clean up the Sabarmati with new sewage treatment infrastructure. These include providing interceptor sewer lines along both banks of the river to divert sewage to Ahmedabad's two sewage treatment plants; and building retaining walls which will protect the low-lying areas near the riverbanks from flooding. A key element of the project is a new linear two-level promenade. The lower promenade with an average width of 10 meters will be just one meter above water level, providing

uninterrupted pedestrian access to the water.

Status before the initiative: Despite its historic and environmental importance to the Ahmedabad city, the Sabarmati river was subjected to severe pressure and abuse owing to growth and expansion of the city. Sewerage contaminated the storm water out falls. Industrial waste posed a major health threat and environmental hazard to the river. Urban poor settlements located on the river banks posed a safety hazard during monsoons as the settlement was on flood prone areas. It was therefore imperative that an innovative initiative be taken up for transformation of the river and surrounding areas.

Project Benefits: The project is expected to generate major city level benefits. The proposed project would recharge ground water resources owing to the continuous presence of water in the river as city is heavily dependent on ground water for its water supply. The proposed river front is expected to decongest the major north - south road (Ashram road) by providing additional linkages parallel to the river. It also provides additional linkages between two banks for inter river traffic. In the SRFD project, 'afflux bunds' or embankments are being constructed. This would eliminate the annual flood affecting low lying areas of Ahmedabad. The urban poor communities residing on the flood banks of Sabarmati River are to be shifted to another location where they would be given constructed houses. The rehabilitation packages will thus improve their economic well-being, while eliminating the risk of flood wash out. Relocation of slums will make the flood management task easy. The informal markets (Gujrari phool bazar) which are held on the banks of river will get better infrastructure against the problems like lack of accessibility, parking space, water supply etc. Ahmedabad lacks adequate public and open spaces. The proposed project consist over 70 acres of land to be developed as parks and gardens and space for cultural facilities. The proposed river front would give a pleasant environment to the city. It can provide a highly attractive city level area which can become an icon for this city. It can contribute to the image of the city, helping in making the city an attractive investment destination.

Strategy for Implementation: The

Sabarmati River Front Development Corporation Ltd. (SRFDCL) is the Special Purpose Vehicle Company (SPV) wholly owned by Ahmedabad Municipal Corporation (AMC) created to implement the project. The SPV model is being used to avoid delays associated with municipal decision making, introduce ease in raising resources, and give implementation efforts focussed attention. The riverbed land, which was originally held by the Government of Gujarat, is transferred to AMC. AMC has in turn granted development rights to SRFDCL for the reclaimed land. An important and defining feature of the project is that most of the reclaimed land would be used as open places for public purposes. Out of a total of 202 hectares of reclaimed land, over 50 hectares would be utilised towards open spaces such as roads, parks, and gardens whereas only 14.5 ha shall be used for commercial development. In order to develop and design the project, a detailed physical survey was carried out. The key findings revealed that river runs a meandering course in about 9 km in greater city areas with an average width of 340-600 m. Further the reduced levels at Subhash Bridge and Vasna Barrage are 39.2 m and 37.4 m respectively. The river edge is not clearly defined and gently slopes down. Many urban poor settlements are present and people are living precariously on these edges. Based on this understanding, several defining features of the project were worked out. For instance, it was decided to maintain a uniform width of 275 m for the river throughout the length.

In order to understand the impact of the project on river hydraulics, estimations of High Flood Levels (HFL) of 4.75 lakh cusecs of water (100 years peak) was analysed in terms of required embankment heights and existing riverbank. The analysis showed that for three waterway widths of 250 m, 275 m and 300 m, the width of 275 m was optimal. The embankments help in preventing floods in low lying areas. The alignment of the proposed 275 m waterway within the river bed was determined based on the criteria of technical issues pertaining to river hydraulics and embankment design, existing land use pattern, and potential for incorporating new developments. The project envisages a comprehensive development of the reclaimed portion of the river bed in a manner that maximum number of public facilities and benefits are created for the Ahmedabad city. The project further envisages proceeds of sale of portion of reclaimed land to assist in the financial viability of the project so that public funds are not stretched.

Urban Planning and Land Use Proposals in the Project: Land use allocation for reclaimed land was determined based on the considerations of existing land use, potential for development, structure of the road

network and transport pattern, bridges proposed in Ahmedabad Development Plan, possibilities for providing infrastructure facilities; and the extent, location and configuration of reclaimed land. The major proposals regarding land use are innovative. The main proposal regarding road network is creation of the East River Drive (four lane) and the West River Drive (four lane). Other features are junction improvements, access roads and connection with bridges. Nearly 70 acres of parks and gardens, spread over five different areas are envisaged along the river edge to cater to recreational needs of the city. The project envisages a continuous corridor along the river edge in the form of a promenade of width varying between 6-18 m which would act as a pedestrianized tree lined walkway. It would be possible to access the river directly from this zone. Infrastructure creation for Sunday informal market and flower market is proposed. A new market with appropriate infrastructure will replace the old market at the same location. Creation of commercial areas is planned on both on East and West Banks.

It is proposed to lay water mains on East and West Banks and other branch lines to serve the requirements of the proposed new developments. Further, trunk sewers parallel to and underneath the river side roads on both banks on East and West river drives is proposed. They will terminate the sewerage at the treatment facilities located near Vasna Barrage.

Result Achieved: About 75 per cent of the construction work is complete whereby the promenade, earthwork and diaphragm wall are nearing completion. The infrastructure work in terms of roads, gardens and parks etc. is under significant progress. The Interceptor Sewerage work has now been completed. It shall divert the sewerage falling from around 36 nalas from the city to the pumping station directly. Earlier this sewerage used to fall directly into the river earlier, making the water dirty, mosquito ridden and creating an unhealthy environment. All sewerage now goes to pumping station, leading to transformation in river quality, and drastic improvement in environment around the river. One of the key challenges successfully overcome is the Rehabilitation and Resettlement of Project Affected Families (PAF). The riverbed is home to about 10162 PAF. SRFDCL is allocating houses of 36.5 square metres each for rehabilitating the PAFs. As part of this initiative, all 10,162 families have already been allotted new residential units and of this, around 7348 have been shifted to the newly constructed houses as on Dec 2011. The process of detailed planning and execution of urban design elements in terms of institutional area, gardens and recreational area, commercial area is in progress.

Sustainability: Project involves balanced land use planning whereby nearly 55 per cent of the riverfront will comprise open area without construction in the form of gardens, roads etc. Development of five large gardens make it one of the largest such developments in the country. This will ensure that the benefits of reclaimed land continue to flow to the people for generations. A promenade or walkway throughout the length of the riverfront will allow access to the people to the river, allowing them to hold events, cultural shows, walkabouts etc. Allocation of adequate residential units for relocation of households affected by project is nearing completion allowing the PAF better quality of living environment. Development of six lane and four lane road along the entire length of east bank and west bank respectively is nearing completion, allowing decongestion benefits to materialise. The interceptor sewerage will allow clean water to flow into the river, sustaining environmental benefits. The project has provided an opportunity to transform a significantly important, but

neglected, part of the city in terms of organised urban renewal. It is one of the biggest such projects in terms of scale and with a very large potential impact in terms of land use, urban design, environment and recreation. There will be multiplier impacts in terms of transformation of inner areas, in the living conditions of the urban poor and in terms of city image and branding.

Transferability: The project is freely replicable across other cities of India. In fact many cities such as Chennai, Rajkot, Surat etc. have begun to plan their own riverfronts.

New Initiatives in Application of Construction Technology for Affordable Housing (Light Weight Construction Technology) by Karnataka Slum Development Board-A Case Study

The Karnataka Slum Development Board (KSDB) has been awarded for application of environmental friendly building material for housing for the urban poor in Karnataka. Ministry of Housing & Urban Poverty Alleviation, Govt of India has approved construction of 24,508 dwelling units for slum dwellers both in-situ and relocation under JNNURM-BSUP in the two Mission Cities of Bengaluru and Mysore, in three phases, with total project cost of ₹ 726 crores. The projects have been started by KSDB nearing the end of 2008. Conventional RCC framed structure for G+3 and non-framed for single storey (GF) units has been adopted. Project implementation period of conventional construction is longer and also monitoring the quality was difficult. With a view to expedite construction and also to effect savings in cost and improve quality of construction, the Government of Karnataka considered invitation of tenders to explore Fast Track Construction Technology available in the country for adoption in the construction of GF – 1200 dwelling units and G+3 – 4866 dwelling units.

State Government constituted a Committee of Technical Experts to prepare Technical parameters, specifications and also evaluated technologies received and financial offers received in response to the tenders. The following technology was selected by the Committee.

1. Light weight concrete technology for Ground Floor Houses- 1200 Dwelling Units for ₹ 3,126 lakhs
2. Shear wall for Ground + 3 floors-4,866 Dwelling Units for ₹ 14,152 lakhs

Wall casting

Substantially completed units

Environmental Friendly Design – Light Weight Concrete Technology for Ground Floor

With the experience gained in the construction of GF units with light weight concrete, Govt. of Karnataka directed KSDB to take up ASARE Scheme in the flood affected areas of northern part of the State. The ready availability of raw materials especially quality sand has been an advantage for adopting light weight concrete technology. KSDB has taken up construction of 2700 GF units at a cost of ₹ 3791.20 lakhs and work is in good progress. As the most of the northern part of the State is having black cotton soil, the unit is being founded on piles instead of footing and pedestal.

Structural Configuration :

Shuttering: Pile foundation, plinth beam with M15 Grade conventional concrete and monolithically casted shear walls and roof using PLASTECH form work systems with Structural Light Weight Concrete (SLWC) of 1600kg/cum density with 28 days target strength of 15 N/mm^2.

Foundation System: The Black Cotton Soil pile foundation with pile cap and plinth beam is proposed. The RCC piles are of 500 mm diameter.

Design Code and References: The structure will be designed to India Codes of Practices for the relevant works.

Strength Of Materials :

Cement & Concrete: 53 Grade OPC confirming to IS 8112 will be used for concrete unless site conditions require otherwise. Concrete grade considered for piles and lintel beams upto plinth level is M 15 with 20 mm maximum size of aggregate. Minimum cementatious content will be according to provisions of IS:456-2000, for a "mild" environmental exposure condition.

Reinforcement Steel: Reinforcement shall be confirming to IS-1786. Such bars shall be high yield strength deformed bars of Grade Fe-415.

Structural Light Weight Concrete (Foam Concrete): The Structural Light Weight

Concrete (SLWC) is a mixture of cement, fine sand, water and special foam, which produce strong, light weight concrete containing millions of evenly distributed, consistently sized air bubbles, or cells. The density of SLWC is determined by amount of foam added to the basic cement, sand and water mix. Foam concrete is fire resistant, has high noise and thermal insulation properties and can be sawn, nailed and drilled using conventional tools. SLWC with density of 1600 kg/cum to 1650 kg/cum will be used for wall and roof, LWC with density of 1000 kg cum is used for flooring of the building.

Materials used:

Sl.No.	Materials	Details
1	Cement	53 grade
2	Reinforcement Steel	Deformed bars of Grade Fe 415
3	Concrete	M 15 grade Concrete for footing, pedestals
4	Light Weight Concrete	As per mix design
a	Density 1600 to 1650 kg/cum	For walls and roof slab
b	Density 1000 kg/cum	For flooring

Method of Analysis and Design: RCC Structural elements in the Building are designed to Limit State Method as per Indian Standards. Limit states of collapse and service ability are considered in the design.

Computer Analysis of Structure: The structure has been analysed with ETABS for deriving the design forces and movements. (Analysis made for a higher carpet area, 3000 mm roof height and larger span is considered for this unit also – this on a safer side).

Pile Capacity: The bearing capacity of a single pile is governed by the structural strength of the pile and the supporting strength of soil stratum and the lower one is used for the design.

Mix Design for Light Weight (Foam) Concrete: The philosophy behind marking the mix was to use available materials, in additions to materials that can provide strength as well as quality for making the mix eco-friendly (green). The following mixes were proposed:

Wall casting

Substantially completed units

Dry density kg/cum	Sand kg/cum	6mm down kg/cum	Cement kg/cum	Foam liquid liter	Water liter	Target compressive strength
1200	690	200	310	0.72	146	10.00 n/mm2
1500	940	200	360	0.56	160	15.00 n/mm2

Dry Density 1200 kg/cum corresponds to Wet Density 1390 kg/cum.
Dry Density 1500kg/cum corresponds to Wet Density 1683 kg/cum.
Recommended weight of Foam – 80 gm per liter.

Time Factor : This technology does not require size stone masonry for foundation and bricks with cement mortar which consume considerable time for construction. Utilities like electrical conduits, water pipes can be laid in the shuttering before casting the walls of light weight concrete resulting in saving of time required to break the wall for opening of conduits and redoing the wall as done in conventional construction. However, the curing time is same as required for conventional method of construction. There is no need for plastering as the finish will be smooth resulting in time saving.

Increased Carpet Area: The approved plinth area for ASARE housing is about 23.81 not capital square metres and a carpet area of 17.82 square metres. As against conventional construction requiring 200 mm thick walls, in the present methodology of light weight concrete the walls being 110 mm thick gives an increased carpet area of 20.7 square metres. i.e. for the same plinth area additional carpet area of 2.88 square metres will be available.

Cost Analysis: The cost of conventional construction as at the time of tendering and cost of light weight concrete construction has been compared and there is a savings of about ₹ 1100 per sq metres.

Tests Conducted: Apart from the regular tests like observation, rebound hammer, covert meter, code and load test on roof three essential tests namely Ponding Test, Rain Simulation Test on wall surface, Acoustic Comfort Test and Thermal comfort Test have been carried out by the Civil Techno Clinic

Pvt. Ltd., Bengaluru, on the representative unit built in Kengeri, Upanagara, Bangalore.

Ponding Test on Roof: In order to check the performance of the roof slab during monsoon, Ponding Test was carried out by storing water for 24 hours on roof slab contained in a masonry bund on periphery of the slab. During this period there was no leakage or dripping of water but damp patches were observed which suggested water proofing treatment.

Rain Simulation Test on Wall Surface: Rain simulation Test was carried out by water gutting for ten minutes and again after gap of ten minutes water was sprayed for the same period and this procedure was repeated till the end of sixty minutes. After gap of 120 minutes this procedure was repeated upto 12 hours. At the end of the test the wall was observed for any leakage and seeping. It was observed that there was no dampness or sweating on the other side of the wall.

Acoustic Comfort Test: In order to check the performance of the entire unit for Acoustic comfort a procedure was derived by placing a stereo of 2500 watts inside the unit after closing of all openings. The stereo was switched on full volume and the sound level was measured both inside and outside the unit by decibel meter. The result of test indicated that the unit has good acoustic comfort.

Thermal Comfort Test: In order to check the performance of the unit under extreme weather conditions, Thermal Comfort Test was carried out. The temperature both outside and inside was measured and monitored for ten hours. It was observed that there was a variation of 3^0C indicating good thermal effect insulation.

Advantages of this Technology

- Environmentally friendly.
- In built door frames of Light Weight concrete while pouring avoid usage of Timber and Steel door frames.
- Reduction in dead load of the structure and can be adopted on land fill site.
- It can be manufactured to precise specifications and strength.
- It possesses excellent workability, flow-able and easy to place and finish.
- It can be nailed, planed, drilled and sawn and will take all traditional finishes.
- Good thermal and sound insulations.
- Designed for earthquake resistance.
- Vermin and rot roof.
- Resistance to fire, moisture and frost.
- Reinforcement is continuous and inter locks with all the structural components viz. foundation, walls and roof slab.
- Door frames, window openings are formed while pouring concrete.
- All internal electrical, water supply and sanitary conduits are embedded before concreting.
- Good finish is ensured as walls and ceiling do not require plastering.

Comparative of Conventional and Light Weight Concrete Technology

Details	Conventional construction	Fast track construction
Wall thickness	200 mm	110 mm
Period of construction for 1000 units	12 months	6 months
Shuttering	Local	Imported (Malaysia)
Shuttering life	15 usage	150 usage
Cost	₹ 9250/sq m	₹ 8140/sq m
	₹ 861/sq ft	₹ 756/sq ft

Conclusion: The technology is environmental friendly as only two materials are used i.e. concrete and steel. Sized stones for foundation, cement block for walls, timber and steel for door frames, cement plaster for walls and roof are totally avoided. Being RCC structure zero expenditure on maintenance is there except painting. It is a suitable technology for fast track mass housing.

Other Entries

- **Urban Governance**
- **Housing, Urban Poverty and Infrastructure**
- **Urban Transport**
- **Environmental Management**
- **Energy Conservation and Green Building**
- **Urban Design and Regional Planning, Inner City Revitalisation and Conservation**

Urban Governance

E-Governance Initiatives to enhance Transparency and Accountability by Ahmedabad Municipal Corporation, Gujarat

Purpose of the initiative is to make use of Information Technology in mobilization of Ahmedabad Municipal Corporation (AMC) resources and utilization of these scarce resources with an aim to provide better "One Spot – Non Stop" services to citizens and provide Information, Communication and Technology (ICT) tools to its employees for back office automation. Secret of success lies in doing away with discretionary powers vested with a few officials and provide easy access to all relevant information. Transparency and accountability for citizen as well as employees are values ingrained in the project. Applications like Property Tax, Vehicle Tax, Birth & Death Registration, General Citizen Complaints, Grants, Provident Fund, Employee Orders and Circulars, City information were covered. Process Re- Engineering was done for managing the Municipal Corporation in a better way.

AMC is the first in country to cover the solution of municipal activity and services like birth and death registration, building plan, primary health and education, city cleanliness, water supply, sewage, road, streetlights, parks and gardens through e-governance to the citizens of the city. AMC has established 26 City Civic Centres located in six zones of Ahmedabad city. Six zonal offices and various other offices are interconnected via intranet application. In

addition, Ahmedabad Municipal Corporation is up-scaling this network to 64 wards of the city.

The quality of citizen service delivery system is improved and these services are offered with optimal effectiveness and transparency. Services through E governance increased from 3 services to 14 services at single window system. 89.66 lacs citizens have visited civic centres for various services. Number of transactions has been increased by 7 times in last 9 years. Tax collection has been increased from 38% in 2002 to 80% in 2010-11.

Accrual Based Double Entry Accounting System by Surat Municipal Corporation, Gujarat

The Surat Municipal Corporation had been operating cash based accounting system which was causing difficulty in day to day transaction. Under this system, at the year end, income and expenditure accounts were prepared separately for each fund. But these accounts remained only an abstract of cash transactions and did not show the operating results of the Corporation. The system failed to generate timely and necessary information for control and planning purpose. Further, any revisions to be recorded in the system required too much paperwork and lengthy register keeping thus rendering the system somewhat unwieldy. With the introduction of the Double entry Accounting System, preparation of Balance sheet has become easier. Preparation of budget and outcome based budget is also possible and separate fund wise reports are also possible. The accounting policy is as per the Bombay Provincial Municipal Corporations Act or BMPC Act which is based on the objective of maintaining transparency of accounting records.

The adopted system is now fool proof and designed in a way to match the National Accounting manual Code. Modules are maintained and accounting report can be generated maintaining global standards. The results achieved include better financial management, control over cost, property tax management, transparency in municipal accounts, timely preparation of final accounts, valuation of fixed assets and effective material management. The Surat Municipal Corporation has been operating the Double Entry Accounting System since 1992 and it has contributed tremendously towards formation of accounting policies and problems related to the earlier system have been resolved.

E- Governance Initiatives of Rajiv Gandhi Rural Housing Corporation Limited (RGRHCL), Karnataka

Online Beneficiary Approval System

GPS based Physical Progress Monitoring System

Electronic Fund Transferring System

The company was established in the year 2000. At the initial stage, the housing schemes were implemented through 27 Deputy Commissioners (DCs) and Chief Executive Officers (CEOs)-Zilla Panchayath of the District, wherein the Physical Progress report were sent by fax to RGRHCL and it was re-entered and consolidated for further releases of funds. The funds were released based on the progress report to respective

DCs and CEOs from where it was distributed down to Taluk Panchayaths (Block) and Local Urban Bodies and it was further distributed down to Gram Panchayaths and finally the money was given to beneficiaries through Account Payee Cheques. It used to take 3 to 4 months to reach the end beneficiary. During 2001-2003 the Company started issuing the Paper Limits (At Par System) for making release of funds and also the progress reports were received through e-mail. Here the time for reaching the money to the beneficiary was reduced to one month. During 2003-2005, the Company introduced Online Progress Updation (Gram Panchayath wise), Offline Approval System and the Paper Limits (At Par System) for making release of funds. Here the time for reaching money to the beneficiary was also reduced to one month. In the year 2005-2009 the company started implementing housing schemes through 5628 Gram Panchayaths and Bank Account was opened by RGRHCL for all 5628 Gram Panchayaths through Core Banking. Direct Release of Funds to Gram Panchayaths account through Electronic Fund Transfer System was introduced. RGRHCL was the first to implement this system in the State. Here the reach of money to the beneficiary was reduced to one week.

From 2010-2011, the company is using the Online Beneficiary Selection (Approval), Online Physical Progress Updation Beneficiary wise, Global Positioning System (GPS) Based Progress Updation and Direct Release of Funds to Beneficiary's Account Systems for monitoring the housing schemes more effectively and in a transparent and fast manner. Here the reach of money to the beneficiary has been reduced to one hour.

E-Governance, Institutional Reforms and Decentralisation by Greater Vishakhapatnam Municipal Corporation (GVMC), Andhra Pradesh

The project was initiated in 1999 to adopt cutting edge technologies in civil administration so as to bridge the widening gap between the Municipal Corporation and citizens and to bring in greater transparency in the processes. A centralised database of information was created at GVMC with amenity to 17 E-Seva Kendras, 6 Zonal Offices, 6 Commercial Banks and Private/Government Hospitals. The aim was to provide a networked access of all important information to the citizens

through a user friendly interface. The project covers the entire gamut of civic services ranging from online payment of dues, filing of building plan applications, status of applications, online grievance redressal system to upto date information base of the various development projects launched by the Corporation. The project offers access to various public documents, official government orders, budgets gazette certifications in a reliable, quick, efficient, and inexpensive manner. The system also helps in speedier processing of applications for authentication of various certificates from the competent authority. Online payments of taxes, duties, rents, user charges for services were facilitated through this project. An online system adopted in conducting business with private sector contractors inspires greater transparency and confidence in the Corporation's dealings.

Web Based Property Tax Payment System by Bruhat Bengaluru Mahanagara Palike (BBMP), Bengaluru, Karnataka

BBMP being extended to 800 sq km of area, the citizens were finding it difficult and time consuming to come all over to the ward offices to fill the relevant forms, wait to know the amount from the official and then make the payment. Introduction of online property tax payment system with web-based SAS Tax Calculator catering to residential, non-residential and vacant land owners, helped to calculate the property tax based on certain parameters like category, type of house, year of construction, zone, built-up area, etc., and before paying their property tax. The calculator is been accessed by about 10 lakh persons. In 2008-09, there were 4 different types of Self-Assessment Forms to be filled by the citizens to file their property tax. In 09-10, only two types were introduced. From the year 2008-2009 the property owner (citizen) can assess the property and fill up the appropriate form and submit in their respective BBMP Help Centre (BBMP One). BBMP has opened around 260 help centres in coordination with National Informatics Centre (NIC). This application, a user friendly web-based SAS Tax Calculator catering to residential, non-residential and vacant land has been accessed by about 6 lakh persons. The package provides the payment details as declared by the owner for 08-09 to be paid for current year using Form 4. If there is any change in the usage of the property, the owner can file returns online using Form 5. The system calculates the property tax as per the details given by the owner. The citizens can pay the property tax in any of the modes including Internet payment, through BBMP Help Centres, Bangalore One Centre, and through ATP (Any Time Payment) kiosks which are under implementation.

The initiative has benefitted the end user by saving time and money. It is more accurate and offers greater transparency. It is eco-friendly and cost saving due to usage of less number of paper based application forms. It enables collections round the clock and also on weekends, leading to higher collections. Daily reports are generated for better analysis and effective administration.

Urban Governance Initiatives of Hubli-Dharwad Municipal Corporation (HDMC), Karnataka

Decentralisation of Administration

Due to the rapid growth and urbanization in the twin cities, the geographical area of the Corporation has increased to 202.4 sq.km comprising 45 revenue villages. As any other municipality, there was a huge demand for services due to increase in population. The municipality was not able to deliver efficient services to its citizens on time. For every service rendered by Corporation, citizens had to come all the way to Head Office. There was no system to keep the citizens aware of the person in charge in various departments. This ultimately consumed more time and caused delay in redressal of public grievances. Administrative decentralization seeks to redistribute authority, responsibility and financial resources for providing efficient public services. HDMC, in order to increase its credibility among citizens, came up with an idea of decentralizing the administrative process. The twin cities having an area of 202.4 sq km were divided into 12 zones covering 67 wards. Each of the zonal offices has been assigned a fixed geographical area/physical boundary within which it has to function. They are headed by the Zonal Assistant Commissioner to ensure efficient and effective service delivery. This initiative encourages public participation in improving the urban governance by involving the interested non-governmental organizations (NGOs) or residential welfare associations (RWAs) to review and monitor the activities of the zonal offices. These offices function as citizen service centres delivering various kinds of services such as building completion certificate, khata extract, birth/ death registration and certificate issue, property tax collection, etc. HDMC also offers online service delivery by building a Wide Area Network connecting all its centres to the central server located in the main office at Hubli.

The introduction of this policy of Administration has helped build the credibility of HDMC. The functioning of zonal office has helped in better property tax collection. The citizens were satisfied with the efficiency of service delivery from past one year. The monitoring mechanism has increased the accountability among the staff of the zonal office.

Transparency and Accountability in Expenditure

HDMC is the second largest City Corporation in Karnataka, having around one million population and spending around 50 crores out of its own revenue. HDMC suffered from poor financial management. By May 31, 2004, its current liabilities were around ₹ 23 crores. It led to serious problems, strikes and stoppage of work by contractors, allegations of corruption in payment and a drop in credibility of the HDMC among the public. This in turn hit tax compliance, taking the Corporation into a vicious spiral. The Corporation then decided to bring in reforms in its entire administration commencing with transparency in financial management. A strategy was formulated in June 2004, considering all stake holders and the various processes involved. It initially concentrated the mechanism adopted in payment of the outstanding dues. It was formulated in a transparent manner and every detail was published on the notice board and copies were circulated among the stakeholders. It was also made available on the website for citizens and interest groups. In just two months, it made a significant impact in the decision making processes of the stake holders. The uncertainty factor among the contractors vanished, and they gained confidence.

Citizens realized the transparency in financial management and visualized the better usage of the tax paid. The credibility of Corporation increased, which led to higher tax compliance and within a few months, the current liability was brought down to around ₹ 9 crores, while the revenues went up remarkably.

The transparent policy has brought many changes in the working environment of HDMC. Earlier, the officers in Accounts Department could not concentrate on their work as they were facing a lot of pressures from the contractors for payment of bills. Now after the establishment of the transparent system, bills are directly paid to the contractors through their bank account. The process of establishing this new system database has been taken up in such a way that information is available to all at the click of a button. Report generated from the database and analysis of the same, have helped HDMC staff to streamline and plan their expenditures as per the revenue generation. This process has increased the efficiency and quality of the contractors' work.

Improved Service Delivery Initiatives (Implementation of ISO certification and Citizen Charter)

HDMC has successfully implemented ISO 9001:2000 International Standard, certified by TUV [Nord], a certification agency accredited to ISO Body. The Quality Management System provides guidelines for Efficient and Effective System resulting in improvement in the Performance of the organization. HDMC is the first urban organization in Karnataka to receive the ISO 9001:2000 certification during the year 2007. Citizen Charter has been implemented in the year 2009 to meet the time frame for all obligatory citizen services. The Internal Audits conducted have proven the performance level of the employees to be at 80 to 90 per cent compliance. HDMC has successfully been re-certified for ISO 9001:2008 by TUV Nord from April 2010-2013. The Citizens Satisfaction Survey showed the satisfaction level conducted during November 2011 is 81 per cent.

Management & Information Systems (MIS)

HDMC has taken a bold decision to make available all the necessary information for public. The MIS Cell was established in the year 2004 and it has emerged as the lifeline of HDMC. HDMC can boast of being the only Corporation among all the Municipal Corporations in the state, which was first to have its own in-house Software Development team. Good service to individual zones assures good revenue. This initiative is socially sustainable as citizens form a part of the process by monitoring the performance of the MIS. The technical process is transparent and every month the progress of the zonal offices is provided in the website. Care has been taken that there is monitoring at all levels and the proceedings of every review meeting is circulated to all.

GIS Development for Efficient Administration by Rajkot Municipal Corporation, Gujarat

Rajkot Municipal Corporation has adopted Geographic Information System (GIS) based data base management as an effective tool to enhance and strengthen its capacity to deliver sustainable access to services for the citizens of Rajkot. The integrated GIS envisages to allow Corporation to view, query, and analyse geographically based data. The GIS will very soon be integrated

with existing and internal databases and system like Zone, Ward, and Tax Zone etc.

The project scope includes collection of various existing maps and their integration using Quick Bird high resolution satellite data, field survey, incorporation and validation of field survey and existing data, development of open web based GIS software and development of customised stand-alone open standard GIS application. Differential GPS (DGPS) and Total station survey is conducted in order to have accuracy and uniformity in system. Detailed property and topographic survey is conducted capturing very detailed attribute information of properties, roads, street lights, signals, water supply system, sewage system, bus shelters, public conveniences and trees. After implementing the project, the Corporation is now in the position to quantify and classify detailed information regarding the various services and infrastructure. It has compiled good data base of the land use including the green cover which shall help in much better planning and management of the city.

Resource Mobilisation Initiatives of Naya Raipur Development Authority (NRDA), Chattisgarh

Capitol Complex comprising of the Secretariat, H.O.D. Building and Allied Facilities in Naya Raipur (nearing completion)

The vision is to develop Naya Raipur as modern, eco-friendly city and role model for best practices in Water Harvesting, Waste Water recycling, Solid Waste Management, use of non-conventional energy resources and urban transport through BRTS; and designed as a citizen and visitor friendly city which would promote sense of safety, security and comfort among its citizens and visitors, especially women, children and the physically challenged. It was decided to develop it in a self-sustainable financing model like most real estate projects maintaining no profit no loss strategy in long term. Land infrastructure including physical, social and economic infrastructure was not adequately available for a rapidly growing newly found State of Chattisgarh. Land is important resource for development of city which was purchased directly by mutual consent and from owners

for inclusive deve-lopment. The compensation package for affected persons /stake holders for the land assets has been decided after a series of con-sultation at different levels. The requirement of capital is met through various sources like Grants from Govt of India and State Government, grant under JnNURM and Government loans, receipts from sale of developed land and from PPP projects, grants and loans from HUDCO, World Bank, Asian Development Bank and other sources.

First Residential Project Sector-27 in Naya Raipur

For self-sustainable city development, NRDA obtained financial assistance from HUDCO that has boosted the effort of development and land procurement. City level water supply, logistics hub and real estate projects like hotel, golf course and themed township, sports city, etc. is being developed through PPP model. Further to have minimum staff cost, project preparation and management are out sourced. Upto November 2011, 4593.44 hectares out of 5900 hectares of private land has already been purchased with least disturbance. NRDA has been having contin-ous consultation with the stakeholders, building consensus among the politicians, instiling confidence among the project affected persons and building transparency for procurement of land and award of contracts without any hassles.

Housing, Urban Poverty and Infrastructure

Affordable Housing for Urban Poor with Integrated Urban Infrastructure by Avas Vikas Limited, Jaipur, Rajasthan

Actual site photograph of affordable housing project in Jaipur Development Authority region

The partners for the projects undertaken are Department of Urban Development and Housing, Govt. of Rajasthan, Avas Vikas Limited, Jaipur Development Authority, Urban Improvement Trust, Bhiwadi, Urban Improvement Trust, Ajmer, Urban Improvement Trust, Udaipur, Municipalities of Chaksu, Dausa and Kuchaman City as well as private builders and developers who have surrendered their land for affordable housing projects. The Govt. of Rajasthan has accorded a very high priority to the challenging task of providing appropriate shelter to its citizens. With all round increase in cost of land, building materials, labour and infrastructure, affordable housing has become a distant dream for the economically weaker sections and low income group. Therefore, the State Govt. has come up with the "Affordable Housing in Public Private Partnership (Sahbhagita Avas Yojana)" for integrated and sustainable habitat development with a view to ensure equitable supply of land, shelter and services at affordable prices in Rajasthan. The phase I and II of the scheme was launched in 2009 and 2010 respectively and under these 10,956 houses have been constructed in 7 cities in Rajasthan under phase I and about 10,624 houses are being taken up under phase II.

Housing and Infrastructure Services for the Urban Poor including Education and Health Services; and Community participation in delivery of sanitation by Greater Vishakhapatnam Municipal Corporation, Andhra Pradesh

JNNURM Housing - Mantripalem

The Greater Vishakhapatnam Municipal Corporation (GVMC) has taken up construction of 24,423 houses along with infrastructural facilities with an aim to provide housing to the urban poor in Vishakhapatnam. The scheme has been taken up with the objective to ensure Vizag city without slums by 2021 through provision of pucca individual houses to the slum dwellers and reallocation of slums existing in hazardous and vulnerable areas.

For a slum population of 6,48,000, a total of 1,35,324 pucca houses are required, of which 51,030 houses @ ₹ 1,65,000 per house having 25 sq m of area has been provided so far, in Vizag. Out of the 51,030 houses provided, 15,320 houses have been provided by the GVMC, and the balance have been taken up by the Andhra Pradesh State Housing Corporation under the Rajiv Gruha Kalpa, Valmiki Ambedkar Awas Yojana (VAMBAY), Indramma Urban and the JnNURM. GVMC has taken up these 15320 houses, under the JnNURM with State and Central support, during the year 2007 and 2009, of which 12326 houses are completed and balance are in brisk progress. Infrastructure services are in various stages of progress. After completion of all the infrastructural facilities in the colonies, the houses will be allotted to the eligible beneficiaries for occupation. The urban poor shall live in better living conditions, neat environment with all infrastructural facilities and shall have access to land tenure. A total of 1,58,395 persons will be benefited by this intervention. Urban Community development activities like formation of Self-Help Groups, provision of bank linkages, distribution of pensions under social security are also being extended to the urban poor. Pro-poor reforms, such as internal earmarking of funds, implementation of 7 point charter, earmarking of land for EWS/LIG in all housing projects are being implemented by GVMC under the Basic Services for the Urban Poor (BSUP). Through a PPP approach, the Subhram and Jana Chaitanya programmes for sanitation are also being implemented in GVMC by involving the community. The GVMC has also contributed to education through the Sweekaram (Adoption) programme launched in 2008 where the GVMC Sweekaram Education Society has been extending infrastructural support to GVMC schools by involving private donors.

Upgradation of Employable Skills- UMEED by Ahmedabad Municipal Corporation (AMC), Gujarat

UMEED project promotes customized programs for targeted youth in the age group of 18-35 years from economically weaker sections and enables them to gain access to opportunities for sustainable livelihoods and growth in the new emerging economy. More than 18,000 trained students of UMEED programme are working happily in the field and their dream of economic and social upliftment is achieved due to the programme. Implementation of the programme has resulted in creating awareness among the groups for adopting better living conditions and they are gradually becoming part of the mainstream of the society. Minimum competency standards are specified for every course, whether it is in the area of job skills, life skills or work readiness. Learning achievement levels and progress of candidates are subjected to continuous assessment and monitoring and those who are not qualifying are given reinforcement classes aimed at bringing them to the specified level at the earliest. Realizing the importance of on the job training, candidates are put through apprenticeship training. This has the two fold effect of helping employees obtain work experience, as well as giving employers the comfort of evaluating and moulding the trainee to their organizational/ job requirements before absorption. UMEED also makes the trainees aware of changing economic challenges and the possibilities of their jobs becoming redundant, leading them to constantly strive to move forward towards advance learning opportunities. The corporate industries are also happy as they are getting employees as per their demands. As proper market surveys are made, the demand of the market is also catered.

Affordable Housing to Urban Poor under Jawahalal Nehru National National Urban Renewal Mission (JnNURM) by Ahmedabad Municipal Corporation (AMC), Gujarat

Ahmedabad city has a large slum population. An estimated 2 million people, constituting 33 per cent of the total city population are living in slums or slum like conditions. The conditions range from lack of hygiene and sanitation, lack of access to power, clean water and sewerage, and absence of health and education facilities. Purpose of the initiative is to give affordable and maintenance free (Mascon technology), near to work place (within the central periphery of 190 square kilometres of the city) and hygienic habitations to urban poor. Out of 32640 units constructed by AMC and Ahmedabad Urban Development Authority (AUDA) under the JnNURM scheme, 28,322 units (87 per cent) are already constructed and 16,509 houses have been allotted to the beneficiaries.

It was thus imperative that any major initiative for improvement at the city level would need to address the needs and aspirations of this large section which remained deprived of the basic civic facilities. Earlier approaches did not involve a comprehensive approach that addressed vital gaps in basic contributions to quality of life in city. The earlier approach provided a smaller house admeasuring just about 17 square metres with single room. A multi-pronged strategy was thus devised for the urban poor. It comprised of vital components including addressing the dwelling / settlement needs of urban poor located under either private land, Government land, Urban Local Body land or on plots reserved for certain public purposes ensuring complete coverage of entire strata of urban poor locations and; provision of infrastructure facilities such as water, sewerage, power, proximity to health and education; provision of affordable transport for accessing places of work and; livelihood generation programs such as UMEED.

As part of this initiative, AMC & AUDA are constructing 32,640 dwellings under Jawaharlal Nehru National Urban Renewal Mission. As of now, 28,500 dwellings have been completed.

Housing and Services for the Urban Poor by Jabalpur Municipal Corporation (JMC), Madhya Pradesh

A very high percentage of urban population currently lives in slums. In this context it is imperative that the urban local body adopts a process through which they become engines of growth on one hand and promote integrated development of the slums on the other hand. To successfully do this, Urban Local Bodies have to adopt bottom up approach initiating their planning process from residents going up towards higher authorities. Jabalpur Municipal Corporation (JMC), under assistance from Madhya Pradesh Urban Services for the Poor (MPUSP) has successfully adopted this approach. It involved the Resident Community Volunteers (RCV's) from all the slums in designing the infrastructure. JMC has selected 35 slums to implement project UTTHAN. The programme supports the development of Community organizations and builds their capacities to enable access to services and entitlements, develops inclusive processes to plan, implement and monitor sustainable, externally-funded and self-help projects, generates demand for appropriate sanitation facilities through awareness and promotion of hygiene, increases awareness of the importance of good hygiene and sanitation among slum dwellers, facilitates construction of individual household toilets and establishes linkages with other Government /externally aided programmes. The community structures and micro-institutions are strengthened for 'beyond the program' sustainability of future developmental interventions.

Jabalpur town has 328 notified slums situated in its core and fringe township. Under the present MPUSP intervention, 35 slums had been selected. To address the issues of the slums, Jabalpur Municipal Corporation decided to adopt the policy of micro planning for all development works within the slums. Before designing the framework for micro planning, JMC held consultation workshops with all important stakeholders of the Corporation. Planning of slum level interventions, implementation and community monitoring was focused to achieve the integration of the social, economic, environmental and cultural elements of sustainability with regard to develop community ownership towards the citizen service delivery system developed in their slum. All the slums have formed women Self Help Groups and running them properly by means of depositing their savings regularly, inter loaning and recovery of loans. Entire range of activities of civic infrastructure and community development has been implemented by women of the slum. The project works have provided better living environment in the slum by improving environmental conditions, reducing cost of dwelling, created livelihood opportunities and encouraged women to take leadership and improve life quality of their family and the slum.

Relocation and Rehabilitation of Urban Poor in Jaipur – Slum Free City by Jaipur Development Authority (JDA), Rajasthan

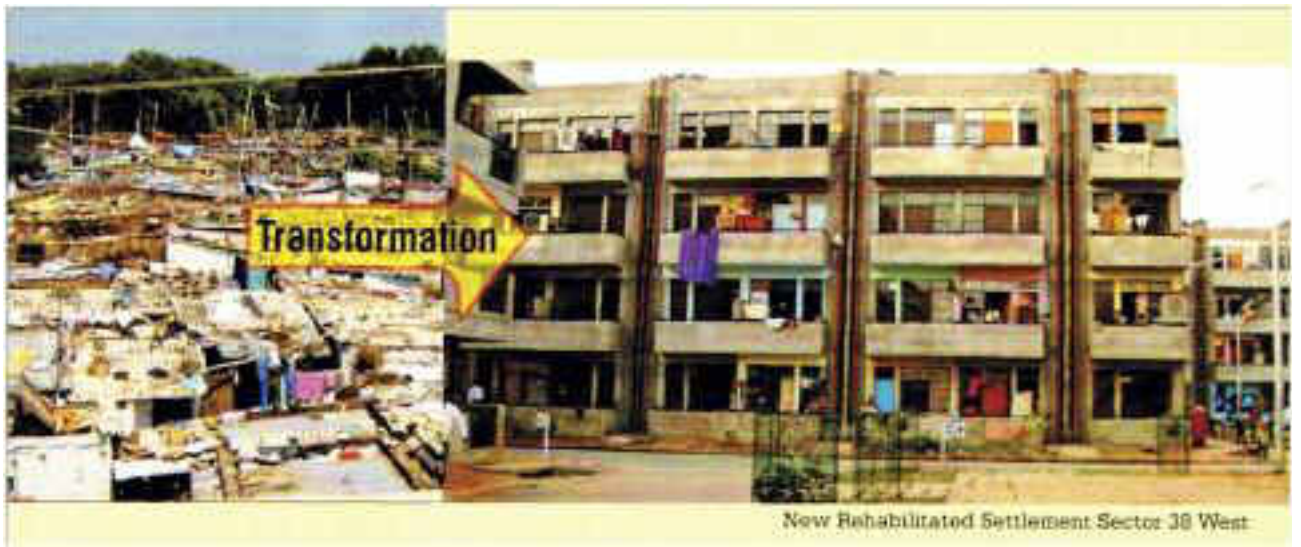
As per information of Government of Rajasthan, the city of Jaipur has 31 per cent slum population in the year of 1991. During the last 7 years (2003-2010), 713 households have been shifted to different locations in the city. The slum dwellers have been mobilised to move to different locations by providing pucca houses with individual water supply and sewerage connection, electricity and other basic amenities. The basic resources have been mobilised from Central and State

Government schemes and additional requirements are met through individual beneficiary contribution of ₹.10/- per day. The cost of dwelling unit is of ₹ 30,000/- and the infrastructure cost is absorbed through cross subsidy mechanism.

The community has been mobilised by Jaipur Development Authority while seeking support from elected representatives including ward councillor of Urban Local Body and Member of Legislative Assembly (MLA) of State. This process has eliminated trust deficit which often exists between the government agencies and the slum dwellers. The beneficiaries have been provided better living facilities and overall environment has been improved. Though the scale of implementation is small, however, it could be upgraded and experience could be a useful input for formulation of projects and implementation of RAY schemes for slum free city initiatives.

Slum Rehabilitation Project under Jawaharlal Nehru National Urban Renewal Mission (JnNURM) by Chandigarh Housing Board

Chandigarh is one of the best planned cities of the country. One of the major mandates of city planning was to provide services to all. However despite best efforts, as it happened in most of the cities and towns in the country, Chandigarh was no exception as regards formation of slums. The process of survey of squatter settlements was carried out first time in the year 1970 and 4,454 Jhuggi households were registered. This number almost doubled in a period of 4 years.



New Rehabilitated Settlement Sector 38 West

Chandigarh Administration proposed to rehabilitate slum dwellers in 1975. One room tenements were constructed in various sectors of the city. The concept of site and services was also introduced in consonance with National City Services scheme.

Despite such efforts, the number of squatter households continued to grow and as per survey of December 2006, 25,728 slum dwellers were identified in

18 different colonies through bio-metric survey. A detailed project report was prepared and submitted for approval under JnNURM and the same could get support for funding from the Central Government. After complete implementation of the scheme, it is understood that there would be no slum dwellers and the city of Chandigarh could be declared as first slum free city of the country. The scheme is under various stages of completion. Under this scheme, beneficiaries will get allotment on licence fee basis and after completion of 20 years, allotment would be on permanent basis. The scheme provides all the basic amenities including water supply, sewerage, electricity connection, roads, parks, play grounds and other necessary services. The property is to be allotted in the joint names of husband and wife while giving preference to the women as first owner.

Funding contribution for implementation of the scheme has come from Central Government, Local Government and the beneficiaries. There is a conscious effort to plan the housing layouts in such a way so as to leave no incidental spaces thus minimising on unauthorised occupations. The implementation of this project has helped to improve the level of living and life style of the inhabitants.

Slum and Settlement upgrading & Improvement- Rehabilitation Project Affected Families by Bengaluru Metro Rail Corporation Ltd. (BMRCL), Karnataka

BMRCL is a Special Purpose Vehicle (SPV) of the Govt. of India and the State Govt. of Karnataka, incorporated for implementation of the Bangalore Metro Rail Project. As part of the phase I of the project involving construction of 42.3 kms of metro line, the BMRCL was required to undertake rehabilitation of Project Affected People in 3 locations, namely Jaibheemnagar, Basaveshwara and Ganeshgudi involving a total of 198 families or 990 affected persons. The project has been formulated involving the beneficiaries in finalising the designs and functional requirements. Construction quality was ensured through adequate supervision by BMRCL. Third party inspections and certification was ensured before issuing of payments to contractors. Rehabilitation compensation was paid to the Project Affected People as per the liberal, comprehensive rehabilitation package offered by BMRCL.

Rehabilitation units at Peenya

The Jaibheemnagar Slum was relocated on a 3.10 acres site in Peenya. The Karnataka Rural & Infrastructure Development Ltd. was entrusted with design and construction of houses. The units are independent two bedroom duplex homes and the structure allows vertical growth possibility upto another two floors. A total of 132 houses have been built at Peenya Depot at a total cost of ₹ 13.24 crores including infrastructure and amenities. The Basaveshwara Slum has been relocated to Sriganda Kavalu, Magadi Road. The Rajiv Gandhi Rural Housing Corporation Ltd. has designed and constructed the houses. A total of 178 houses (independent two bedroom duplex houses with structural provision for vertical incremental growth) have been provided for a total cost of ₹ 16.44 crores. The Ganeshgudi Slum was rehabilitated at Laggere in ready constructed houses of the Karnataka Slum Development Board. 45 families have been relocated in these houses at a cost of ₹ 3.5 lakhs per house or a total of ₹ 1.575 crores towards purchase of these houses from KSDB.

The rehabilitation has been completed in 2009. The living environment of the affected families has improved tremendously in terms of ownership status, access to health, education and basic services. The income level of families has improved due to better occupational opportunities. Gender empowerment is expected through granting of right of ownership in the name of the woman of the house. The children are going to schools and health and hygiene levels have improved.

Theme park at Dharwad

Building Centre Approach for Vocational Training and Employment Generation, Eco Friendly Design and Construction Practices, Appropriate and Cost effective Building Construction and Materials, Technology Transfer, Application of Research and Development by Nirmithi Kendra, Dharwad (Karnataka)

Nirmithi Kendra, Dharwad is a technology transfer centre for the promotion and propagation of cost effective building technologies both in rural and urban areas. It is a part of a national level building centre network programme of the Government of India for the promotion of low cost housing technology through HUDCO. The principal objective of the Kendra is to participate in the development process of the district through providing low cost construction assistance to various housing and infrastructure development works in both rural and urban areas. The Kendra promotes manufacturing of waste based building materials, it promotes large scale application of cost effective building materials and technology in mass housing; it also works towards capacity building of various stakeholders for use of these

innovative green technologies/materials and dissemination of knowledge in the public forum.

The Kendra has taken up construction of 1817 houses for rehabilitation of flood affected districts of Dharwad and Gadag in Karnataka, for a total cost of ₹ 2543.80 lakhs, using appropriate building technology. The Kendra has conducted several training and awareness programmes for technical and non-technical persons including skilled upgradation of construction work force. As a result of training and entrepreneurship programme taken up by the Kendra, more than 3500 people have gained employment on a decentralised basis through Dharwad District. The Kendra has produced a total of non-conventional building and components worth ₹ 5-6 crores. About 3000 houses and 100 public and infrastructure buildings have been constructed in Dharwad as demonstration projects to instil confidence amongst the public regarding the non-conventional technologies.

Access to Basic Services to Urban Poor through Community Participation by Thiruvananthapuram Corporation, Kerala

The Corporation has adopted a holistic approach for the project Basic Services to the Urban Poor (BSUP). The aim was to improve the basic needs of the people for a smooth, happy and sustainable sustenance. Kudumbashree, the State Poverty Eradication Mission is the State Nodal Agency for the BSUP under JnNURM in Kerala. The Corporation has partnered successfully with Kudumbashree for implementation of BSUP by using their technical expertise and support. Corporation has taken special efforts in disseminating cost effective technology amongst the people. The Corporation has effectively knitted a partnership with the Community Development Society (CDS), the Apex body of the Kudumbashree Neighbourhood network. Urban Local Body's decision was to target the actual beneficiaries and give them holistic support. This could be fulfilled only through direct community participation and empowerment of the citizen. The BSUP project in the Trivandrum Corporation is being implemented at three different levels costing a total of ₹ 208 crores. At the first level there are scattered houses provided to deserving beneficiaries across the ward and at the second level there are 23 specific slums selected for holistic slum development under BSUP. Out of these some of the slums have only individual houses, some have only flats for all the beneficiaries and the rest of the slums have both individual houses and flats. At the third level there are fishermen settlement areas along the coastal belts which are densely populated and are in dire need of housing and other infrastructural facilities. Here, conditions resemble a slum, though not a slum. Women have played an important role or rather they were the main torch bearers of community level initiatives in implementing the project.

Corporation of Trivandrum has been in the forefront of using Cost effective technology for designing and constructing buildings. By reducing the use of construction material while using alternative technology, the project takes care of environmental degradation, pollution, wastage of resources and wastage of money. Through the technology, Corporation envisages that eradication of slums happens in an eco-friendly way as well as ensuring a sustainable community living environment.

Community Based Environment Development (CBED) Programme by Chennai Metropolitan Development Authority (CMDA), Tamil Nadu

The project is implemented by CMDA in partnership with local bodies, Resident Welfare Associations (RWAs) and Community Based Organisations. Each local body is eligible for ₹ 25 lakhs as grant for one or more project. The local body and the community contribute 10 per cent each of total project cost. Between 2006-07 and 2010-11, ₹ 6.26 crores has been sanctioned under the CBED for a total of 52 projects, of which ₹ 4.91 crores has been the CMDA grant.

The programme aims at improving the quality of environment at micro level through community participation. It was seen that optimal utilisation of municipal services and maintenance of common areas was not happening at the local level due to the absence of a sound maintenance mechanism and lack of involvement of the community. The CBED enables community participation at grassroots level to identify and prioritise environment related issues affecting all sections of the community, ensures full stakeholders participation including elected representatives, creats a common platform for community to work together to solve the local issues, helps in capacity building at the local level to plan, coordinate and formulate feasible bankable proposals with emphasis on environment, in the process ensuring better maintenance and utilisation of the assets created through developing a spirit of ownership amongst the beneficiaries.

The programme has created sustainable assets for the community and the generation next, ensured transparency in the processes and enhanced the capacities of the local community through strengthening of the institutional linkages. Most of the projects improve the quality of living environment at local level. This programme is the first of its kind within the Chennai Metropolitan Area with the involvement of the community, Development Authority and Local Self Government. The maintenance of the assets thus created is taken up by the community. The programme saw high participation and involvement of housewives, businessmen, people from the private sector, increased community participation during project selection, implementing and monitoring stages, caused improvement of immediate environment, mostly parks and water bodies as a result of which ground water levels and property values have also improved. Tree planting was made mandatory in all projects and misuse of open spaces and encroachment has been prevented in many locations.

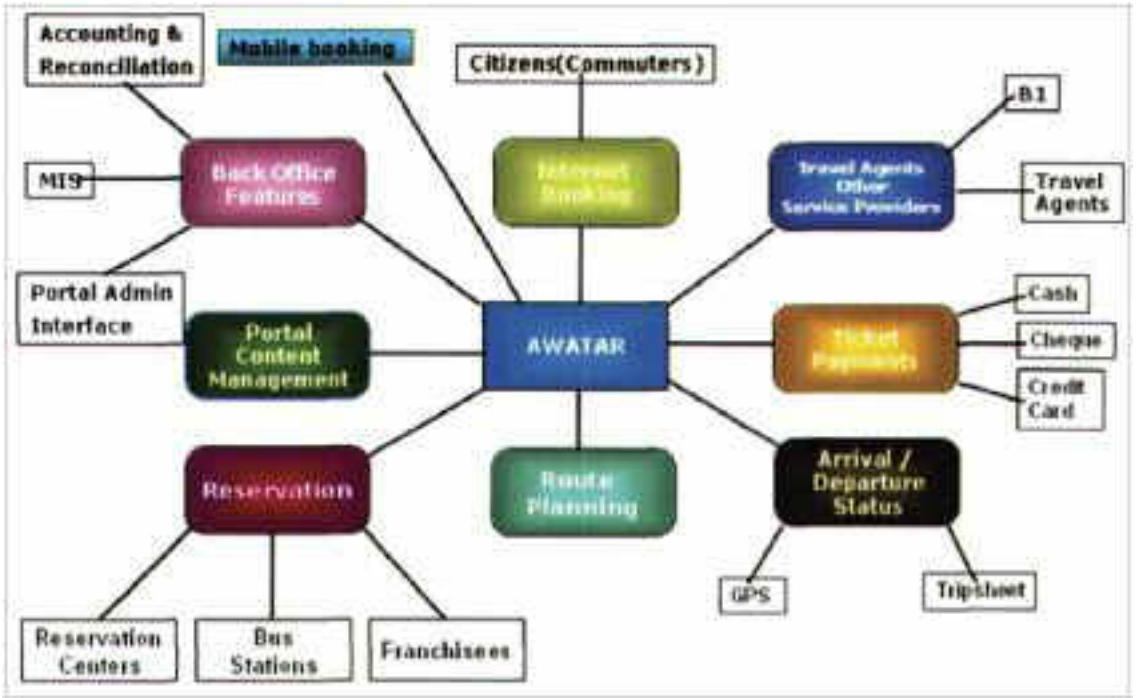
Peerkankaranai Town Panchayat, Park Development at V.O.C. Nagar

Urban Transport

E –Governance Initiatives for bringing transparency and accountability in Urban Transport Sector by Karnataka State Road Transport Corporation (KSRTC), Karnataka

Any Where Any Time (AWATAR)- Advanced Reservation System

Karnataka State Road Transport Corporation (KSRTC) is one of the leading Road Transport Corporations in the country. It is one of the largest and surplus making State Transport Undertakings with a fleet strength of 7,700 buses, with a dedicated workforce of 34,800, transporting over 2.5 million passengers and earning average daily revenue over 60 million. KSRTC's guiding principle has always been to ensure the maximum travel comfort, convenience and familiarity for the commuters. Keeping in mind this motto, the Corporation replaced the traditional passenger reservation system with revolutionary and highly-scalable web-based online reservation system named AWATAR (Any Where Any Time Advanced Reservation) with Mobile Booking & SMS alert. It is the first-of-its-kind-and-scale road transport passenger booking system in the country.



Functional set up of AWATAR

AWATAR has been built on a model that is independent of traffic, geographic location or the computer literacy of users. This web-based online reservation platform has guaranteed accessibility, affordability, reliability and long-term value for citizens. The growing community of commuters who are loyal to booking advance tickets through the e-booking system reveals the success of the

AWATAR application. Before AWATAR, KSRTC had ORACLE based passenger seat reservation system, a client server based one, restricted to booking only for services departing from a particular bus stand. The reservation system was used through Point-to-Point connectivity at the various KSRTC ticketing counters and Franchise Ticketing Counters. The system was based on stand-alone architecture. The AWATAR system is an advanced system that does not just let passengers plan their journey well in advance and reserve tickets online with their credit or debit card, but also integrates mobile booking, service information, route map, franchisee details, bus schedule timings, pick up points etc., under one unified umbrella. This entire system includes 509 reservation counters to enable even those without internet access to benefit from it. Bringing about rapid changes through multiple levels, this system has even made way for better employment opportunities for differently-abled individuals. AWATAR in KSRTC has enabled easy access, optimum revenue collection with growth in accessibility, accountability, transparency and added responsiveness.

Automated Electronic Driving Test System

Safety and reliability are the primary reasons to encourage greater use of public transport, mainly buses. KSRTC carries a huge responsibility towards society for assuring highest possible standard of public safety. This requires highly skilled efficient drivers manning its bus fleet. In this direction, KSRTC has introduced a rigorous driving test - Automated Electronic Driving Test System - in the year 2005, based on digitally addressable, optical proximity sensors for the selection and recruitment of drivers. This "Automated Electronic Driving Test System" conforms to the principles of transparency, uniformity, public accountability, economy, productivity, efficiency and innovative recruitment and is environment friendly.

Vehicle tracks at training Academy at Hassan

To overcome discretionary and external

influence in the earlier driver test manual system, a totally transparent system was evolved to test the skill and ability of the candidates. Tracks which simulate real conditions were developed by using experienced drivers for trial. The number of drivers tested is about 75 - 80 per day and earlier it was a superhuman exercise to test more than 10,000 candidates for a single recruitment, besides wasting considerable technical manpower to do so. This system has revolutionized the driver testing and selection and hastened the process of recruitment. The system assesses the safety of roads spanning 25 lakh kms and covering 25 lakh passengers daily. The direct result of such a focused, precise and tamper-proof test ensures that each of the drivers at the helm of every KSRTC bus has been chosen without bias and solely on the basis of merit, performance, potential and presence of mind, ensuring passenger safety.

KSRTC is having 3 training institutes located at Bangalore, Mysore and Hassan, to impart training to its employees.

Road accidents cause great concern not only to the State Transport Undertakings (STUs) but also to the society at large. The average rate of accident in Urban STUs was 0.26. KSRTC operates both rural and urban services but even then maintains 0.15 accident rate. This automated test system impressed even the state transport authorities who have already launched an Automated Electronic Driving Test System for normal driving tests of motorists to grant motor driving licenses. State governments of various other states and their respective corporations are actively planning on incorporating this model into their mode of selection. KSRTC has already entered into an agreement with Maharashtra State Road Transport Corporation to implement the track on a key turn basis. Police authorities are in talk to evolve the similar system to conduct fitness tests for the recruitment of police personnel.

Electronic Ticketing Machines (ETMs) System

KSRTC has introduced Electronic Ticketing Machines (ETMs) in place of conventional pre-printed tickets in all the bus depots and routes of KSRTC. This is a major achievement in automating the process of issue of tickets, thereby reducing pilferage and reducing conductor time and drudgery. Now all the depots and routes in KSRTC are issuing tickets only through the ETMs, which is the first time in an organization in the country has completely shifted to the Electronic issue of tickets.

KSRTC, at present, is operating its schedules with nearly 10,000 ETMs, covering 72 depots. ETM has proved to be a complete solution for the bus ticketing woes, well accepted by all the stakeholders - passengers, users and the management. There is 3 to 4 per cent increase in revenue, resulting in an increase of ₹ 500 million per annum. Considering the volume of operation carried out by KSRTC (catering to nearly 2.5 million passengers a day), ETM saves a lot of paper being used for the printing of tickets, contributing to the green initiative of KSRTC. Since the workload of printing of tickets and stationery is reduced drastically, services of the staff working hitherto at the printing press are being diverted and utilized in other departments. The best part of ETM introduction is the availability of ticket sale details in a digital format which helps in better management and monitoring of operations.

Sustainable Mobility for Tier I & II Cities

In major metropolises having population more than 20 lakhs, Mass Rapid Transit Systems (MRTS) like Metro and BRTS have been initiated. These are already under different stages of progress. However, for small metropolises and particularly Tier-II

cities having population between 3 to 10 lakhs, effective city bus operations would be the only mainstay for Public Transport System. Considering the need, necessity and demand for public Transport, KSRTC, took up the project of introducing organized public transport system in tier-II cities viz., Tumkur and Hassan.

Tumkur city has been identified as a satellite town for Bangalore, and has been funded under Asian Development Bank assisted programme for Urban Infrastructure. It is already a major centre for education and health and has a railway junction and a major industrial hub. Population wise it is the 10th largest city in the state, the city ranks 6th in position where 2-wheeled automobile population is concerned. The lack of any effective public transport system has resulted in the citizens of the city to embrace personalized modes of transport or the para-transit like auto-rickshaws (shared auto). The alarming rise of automobiles is a cause of concern which is unsustainable for the city. The people of Tumkur were happy and welcomed the introduction of city bus services, which they said would help them to escape from the tyranny of autorickshaws and would provide a reliable transport system. A proposal in this regard for introduction of 25 buses was prepared by KSRTC in September 2010 and sent to the Ministry of Urban Development, Government of India. 10 routes are operational now with 36 buses. Significant modal shift has occurred from earlier modes like auto rickshaws and personalized vehicles to public transport. Total passengers who travelled from 21 Feb to 19 September are 44,11,469. Based on similar demand, in the city of Hassan (city of about 3 lakhs population, about 150 kms. to the west of Bangalore), KSRTC took up the work of route identification with an intention to introduce city bus services in Hassan. These city buses (on the lines of city buses built for Tumkur city) were introduced on 20-4-2011 on the identified first corridor in Hassan city with similar encouraging results. In Hassan, 4 routes are operational now with 17 buses. Hassan citizens have welcomed these city buses with open arms. Total passengers who travelled from 25 March to 19 Sept are 28,25,590.

Urban Transport Planning, Traffic Bottleneck Reduction Planning by Greater Vishakhapatnam Municipal Corporation (GVMC), Andhra Pradesh

BRTS corridor in Vishakhapatnam

To promote Public Transport in the city, the Govt. of India has sanctioned a Bus Rapid Transit System (BRTS) project under JnNURM with 50 per cent of Govt. of India funds and 20 per cent State Govt. funds. As a part of this BRTS project, 2 Road Corridors were taken up for development of about 40 kms with a cost of ₹ 452.93 crores which includes a flyover at Asilmetta. The success of public transport initiative in Vizag shall result in large number of benefits accruing to public directly or indirectly, when the project is made fully operational.

BRTS Project conceived and implemented by GVMC has created a high quality public transport to enhance the mobility pattern and demonstrate that people and community come first. It will increase the modal split in favour of public transport - being the ultimate strategy of the Government of India to promote public transport in the country.

BRTS will re- organise road space with the segregated Motorised Vehicles, Non-Motorised Vehicles and dedicated bus lanes. Systematic movement of traffic in dedicated lanes ensures smooth flow, frictionless travel, savings in travel time/ cost and minimises accidents and enhances safety.

Ahmedabad Bus Rapid Transit System (BRTS)- Jan Marg by Ahmedabad Municipal Corporation, Gujarat

The vision of Ahmedabad as 'Accessible Ahmedabad' is to redesign the city structure and transport systems towards greater accessibility, efficient mobility and lower carbon future. The concept of BRTS is to encourage more people on the public transit system, which with high quality service is delivered. By providing a dedicated corridor within the street for BRTS vehicles, more people can travel to destination in a time that is comparable to single occupancy vehicles such as cars, two wheelers.

The Janmarg, within a short span of 4 months has doubled its rider-ship, gained significant public support and respect for its efficient, reliable and quality service. With total of 88.8 kms of approved BRTS networks, currently 45 kms long route from RTO- Maninagar-Naroda and Bhavsar hostel to Delhi Darwaza is in operation with 67 bus stations. Four routes are in operation for this corridor. BRTS operates between 6.00 am and 11.30 pm daily. The buses run at a frequency of 2.5 to 4 minutes during peak hours and around 6 minutes during off peak-hours. 82 buses catering more than 1,35,000 passengers run every day. The total revenue collection is about ₹ 8,50,000 per day. System wide impacts include relief from congestion, improved safety, maximization of the ridership serving the needs of the poor, provision of opportunities for transit-oriented development, promotion of compact city and encouraging integration with other modes of transit.

Janmarg is the first full BRTS systems in India operated as a closed system. 'networks and not corridors' and 'connect busy places and avoid busy roads' have been basic principles for selecting 90 km long network. The network connects central city with traffic generators such as transit terminals, markets, industries and institutions. It uses Integrated Transit Management System (ITMS) which includes transit signal management, smart card integration, passenger information system, Geographic Information System (GIS) on the buses. Dedicated right of way for the buses and stations with level boarding saves travel time for the buses and make the system more competitive with autorickshaw travel. BRTS streets are complete streets with dedicated bus lanes, cycle tracks, pedestrian facilities, personalised vehicles and optimum parking. It enhances quality of life for all citizens. For people with disability, access to BRTS stations is now easier with ramps, level boarding and better buses.

Environment Management

Environment Management, Pollution Reduction and Urban Greening by Greater Vishakhapatnam Municipal Corporation (GVMC), Andhra Pradesh

A total area of 51.60 per cent (275.33 sq km) of the Vizag city within the municipal jurisdiction is under green cover. These green areas are instrumental in controlling pollution in the city. As part of the environmental management to avoid pollution and improve the health condition of the citizens, the GVMC has introduced an innovative programme in 2011 for establishing cycling zones or tracks in the city. As part of environmental management GVMC, in coordination with NEDCAP (Natural Energy Development Corporation of Andhra Pradesh), is planning to establish street lighting system using solar energy. The Corporation is also planning to provide solar energy units on roof tops of all apartments to meet the requirements of the power supply needs of the particular apartment. GVMC has taken up regularisation of storm water network for the 3 major drains which are running through the middle of the city, in addition to the normal storm water drains provided on both sides of the road network, both on main roads and street roads. In the water supply sector, seven projects with an estimated cost of ₹ 650.29 crores have been sanctioned under JnNURM. Out of the sanctioned scheme, so far ₹ 260 crores have been utilised and balance works are in progress. After completion of these projects, about 1500 kms of drinking water supply pipeline, reservoir of 68,000 kilo litres capacity and water treatment plants of 184 MLD capacity shall be created and 1,50,000 new water service connections to houses shall be provided. With this, the per capita supply shall be 140 LPCD, as per the WHO standards and coverage of safe drinking water supply shall be improved to 100 per cent. It has been made mandatory to construct rain water harvesting structures for buildings and to include waste water recycling for group housing schemes. Incentive of 10 per cent in property tax is given for complying with these norms. GVMC has also taken up construction of Sewage Treatment Plants (STPs) at various locations to take care of the sewerage treatment needs of the city. The treated sewage and sludge, at present 35 MLD, is made available for reuse for industrial and agricultural purpose to companies through a bidding process.

Barren Hill Afforestation Initiative at Kadapa by Andhra Pradesh Urban Finance and Infrastructure Development Corporation


A view of Bandikannuma Hill range

During the period 2009 to 2012, APUFIDC has provided funds of ₹. 9,64,122 which have been utilised for the afforestation of 5 acres of barren hills of Bandikanuma Range of Kadapa in Andhra Pradesh. Land, water, other resources and support required to raise the plantations were provided by the Kadapa Municipal Corporation. The project impact is not only restricted to greening of the rough, barren terrain but also encompasses the livelihood opportunities that were created for several womenfolk living in nearby areas and the creation of a sustainable resource for the people living nearby. The project has been implemented as a community owned initiative. The protection of the flora and fauna and maintenance of the ecological balance of the region achieved better sustainability through the involvement belief of the community. The works involved meetings and mobilisation of community members and local leaders, conducting of surveys, demarcation of areas, planting, fencing, weeding, soil working, watering, application of fertilizers, replacing of plant casualties, continuous repair and maintenance; and monitoring. Capacity building of community who provided the labour for raising and taking care of plants was done. A total of 2000 plants which are drought hardy such as ficus religiosa, azadirachta indica, swietenia mahogany, ficus benegalensis, peltoforum etc. were planted to suit the hot and dry conditions. Involvement of community and social activists of the nearby villages has resulted in timely completion of the project. The barren Bandikanuma Hill range, which only had Bodha grass and shrubs growing in the dry area which was prone to forest fire, is now a green forested area. Continuous monitoring as well as fire retardant and moisture retention techniques such as circular weeding, target the goal of 100 per cent survival plantation. The project has been completed using low cost technology within the limited resources. 90 per cent of the cost of the project has been towards the payment of daily wages of around 50 local women folk involved in the work.

Waste Management in Tenali, Guntur District, Andhra Pradesh by Tenali Municipality

Tenali Municipality has adopted various measures to install an effective method for municipal waste collection. The Tenali Municipality puts in a total of ₹ 3 crores per annum for implementation of the solid waste management system. Women volunteers from local groups, one from each of the 40 municipal wards are employed as local supervisors for 100 per cent door to door garbage collection. Garbage is collected using autorickshaws and transported to compost yard. Local residents have been motivated to segregate wastes at source. About 60-70 per cent of householders segregate the wastes at their door step level. Due to effective garbage collection and elimination of littering, drains in the city also remain unclogged thus improving the storm water drainage capacities. The transfer of knowledge to local groups helps to sustain the system and to ensure 100 per cent garbage collection at micro level. Commercial establishments are charged to a tune of ₹ 1.5 lakhs per month for garbage collection. The town has been declared litter free. There are no dustbins in town for garbage disposal, only source level daily garbage collection is organised. There are 20 dumper trucks for disposing waste by street vendors and advance intimation is required to be made to the municipality for garbage collection from marriages or other functions.

Tenali Municipality has developed a system of recycling of wastes. Due to its recycling activities including all varieties of plastics and papers, the United Nations Environment Programme (UNEP) has included the municipality as its only municipal member in the country. There is also on-going research work taken up by the recycling contractor Vennela Mahila Sangam who is involved in exploring different recycling opportunities for plastic and allied material. Plastic cups are banned in the city for use as a container of hot beverages, thereby preventing health hazard to the consumers and also reducing the plastic waste generated. Composting is done for biodegradable waste material through composting yards. Vermi compost plant is also in operation bringing in revenue.

From January 2011, the Municipality's own in-house magazine has been launched to disseminate information to the public on its environmental protection activities. The activities under the programme for the past 20 months or so, has resulted in changed public attitude towards waste management. Tenali is a successful example for improvement of the living environment through sustainable solid waste management strategies involving the local community including women at large.

Environmental & Waste Management- Waste to Energy by Navi Mumbai Municipal Corporation, Maharashtra

Navi Mumbai Municipal Corporation (NMMC) adopted practice of road sweeping on daily basis in 1992. From open truck to closed body compactor was introduced in 1994 for transportation of solid waste. NMMC adopted the process of partial privatization by appointment of labour contractor. An integrated manual of sweeping was introduced and the scope of work included regular road sweeping, removal of refuse, garbage and cleaning of roads/foot paths, storm water drains and gutters. Later in 2004, NMMC initiated new project of door to door collection. The subsequent year, the NMMC faced number of issues like inconsistency in commitment from labour and vehicle contractors, labour strike etc. The experience passed through a bad phase and consequently, the contracts were terminated in 2006. To have stop gap arrangement, the NMMC provided job on adhoc basis to 81 existing contractors for supply and transportation by using own vehicles.

Primary waste collection vehicles for slums and villages

Learning from this lesson, Corporation took a decision to introduce single tender by incorporation of all works by following the MSW Rule 2000. The scale of work comprises of 4000 bins spread over in area of 108 square metres, 54 large body closed compactors and 46 small size compactors which are used for transporting the solid waste. Compactor trucks are equipped with hydraulic lifting and compaction mechanism. The compactors are used to lift garbage including door to door service. To further improve the efficiency of work and address the complaints of the citizens, the concept of nuisance detection squad was introduced. 50 per cent of fine collected by the squad is passed on to the contractor as incentive. In the year 2007, NMMC provided ISI standard bins of different sizes at different locations and the work contractor has been awarded for five years which has been working very well. The entire process of cleaning, sweeping and solid waste management by NMMC includes mechanisation of street

sweeping by trucks integrated by Global Positioning System (GPS). For overall administration management, contractor, Shree Mukti Sanghatna is employed for organisation of rag pickers and community awareness. The dumping site was another very serious problem, emitting found odour and smoke due to frequent free gas emissions. Capacity of dumping ground was exhausted and stray animals were always scouting for food in the waste. Public pressure and urge was there to follow international standards for waste management. The old dumping site has been closed scientifically and at Turbhe land fill site, leachate tank has been made with the help of British biogas technology group. The Corporation will get a revenue of ₹ 1.5 crores from 1.5 MW electricity generation and ₹ 8 crores in 10 years from flaring of gas from land fill site employing Public Private Partnership (PPP) mode for waste to energy generation which should prove to be a sustainable solution in the long run.

Community Based Solid Waste Management by Notified Area Council (NAC), Patnagarh, Odisha

Notified Area Council (NAC), Patnagarh has successfully carried out the task of community managed solid waste management by involving women Self- Help Groups (SHGs). NAC privatised the sanitation system through involving Non-governmental Organisation (NGO) which provides one green and one red dustbin to each house hold for door to door collection for which equipment and sanitation workers are provided. Different awareness camps are organised to make people aware about environment, pollution and use of dustbins in a proper manner to keep areas pollution free. Self-help Groups have been advised to collect user fee and to charge fine for polluting their areas. SHGs are encouraged for plantation of trees and keeping surrounding area plastic free. Incentive are given for keeping streets/wards clean and prizes are given on Local Self Govt Day. The awareness on environmental issues has had a positive impact. SHGs group are coming forward to keep the environment free from pollution.

Energy Conservation and Green Building

Use of Solar Energy (Solar Grid Connect System) and other initiatives by Rajkot Municipal Corporation (RMC), Gujarat

Rajkot Municipal Corporation had adopted solar energy usage for not just street lighting and water heating system but has also used solar energy in its municipal offices. With support from the Ministry of Renewable Energy (MNRE), it has installed a pilot plant of 10 KWP Grid Connected solar systems at its West Zone Office for captive use in 2009-10. After careful monitoring of 10 KWP pilot projects for 2 years, RMC has initiated process to install additional 110 kW grid connect solar power plants at its various offices with approximate expenditure of ₹ 1.60 crores with 30 per cent being subsidised by the MNRE. The break even for the project is 5 years after which the Corporation has projected savings of ₹ 20 lacs per annum. RMC has also installed 250 solar LED (Light emitting diode) Street lights instead of conventional lights in various gardens of the city. The Corporation has also made mandatory through its General Development and Control Regulations, the use of solar assisted water heating systems in all new buildings coming up in the city. Rajkot has more than 20,000 water heating systems in place and use. RMC has also passed the resolution to provide rebate property tax for use of solar assisted water heating systems, to the tune of ₹ 2500 for residential units and ₹ 5000 for commercial units.

Design, Construction, Operations & Maintenance Arrangements of Forest Complex, SAS Nagar, Mohali by Department of Forests, Punjab Government

Punjab Forest Department has recently constructed a state-of-art Forest Complex on 2 acres of institutional plot with all modern amenities in Sector 68 SAS Nagar, Mohali. The Complex comprises of five aesthetically appealing inter-connected towers having RCC structure with attractive aluminium composite panel /double glazed units of high performance glass as façade. Constructed at cost of ₹ 47 crores the 100 feet high building has covered area of 1,51,385 square feet covering basement, ground and 7 floors. The construction of the building is based on Green Building design principles with special emphasis of Energy conservation. The project has been supported by the State Govt., Japan International Corporation Agency (JICA), Punjab State Forest Development Corporation Ltd. (PSFDC) and HUDCO (₹ 20 crores as loan).

All the offices of the Punjab Forest Department and PSFDC have shifted into three out of the five towers of the Complex. The construction of the complex was undertaken at rapid pace by effectively monitoring, motivating and coordinating the work of all agencies – i.e. Forest Department, PSFDC, contractor, architect, Punjab Engineering College (PEC) and Punjab Industries and Export Corporation (PSIEC). As a result, the Forest Complex was completed in just 18 months by October 2010. With the shifting of all offices of the Forest Department, PSFDC and Wildlife Wing into a single location, enormous wastage of time, money and energy on correspondence between different hierarchical levels of the Department has been completely eliminated. The project has also greatly benefited members of the Public who have work with the Department as they no longer have to run around to different offices and are able to get all their works done at a single location.

One of the strongest features of this project is its financial, social and environment sustainability as a "Green Building" incorporating energy efficient features. It is fact that opting for a more conventional and "practical" design would have resulted in just another "Good" building whereas the Forest Complex in its present form is rather unique.

Renewable Energy Generation and Energy Efficiency by Surat Municipal Corporation, Gujarat

Water supply and sewage consume around 80 per cent of the electricity of Surat Municipal Corporation. With a vision for making the city self-sustainable, use of renewable energy in municipal services was desired and in this direction two projects were implemented by the Corporation- first was the production of electricity from bio gas at Sewage Treatment Plant and second was to install wind power plant for water treatment plant. The Corporation is the first municipal body to install 0.5 MWe capacity power plant based on bio gas generated from liquid sewage waste at Anjana Sewage Treatment Plant in October 2003. The project at Anjana STP has been a successful initiative for productive use of the harmful sewage gases through financial support of MNRE using state of the art technology. The present generation of electricity from this plant is about 8000 to 9000 units/ day, which is consumed to run the Anjana STP itself. Three more such plants for 1 MWe capacity have been commissioned at Singanpore, Karanj and Bhatar Sewage Treatment plants in 2008. There is now a policy made by the Corporation to install such power plants in all upcoming STPs. The Corporation is also the first corporation in India to install 3 MW wind power plant at Village Gosa, Adodar site of Porbandar District in Gujarat. Two wind turbines for 1 .5 MW capacity each have been installed at the sea bank of Porbandar District to produce this clean energy which is wheeled through transmission network of Gujarat Energy Transmission Company and utilised for Saranthana and Varachha Water Treatment plant. The wind power plant is running successfully for almost 2 years.

Development of Building Complex- Ecospace at New Town, Kolkata by Ambuja Reality Development Ltd, West Bengal

Ecospace is green field, multi-user business park project for Information Technology (IT)/Information Technology Enabled Services (ITES) sector located on a 10 acres site at New Town, Rajarhat, District 24 Parganas, West Bengal. The building "Ecospace" has been developed by Udayan Greenfield Developers Limited (UGDL) which is under the umbrella group of Ambuja Realty. The multi-storeyed state of the art "Ecospace" campus offers nearly a million sq of office space along with services to address the latest emerging trends on corporate environments. The project has

been completed in 2009. The project is aiming for a LEED certified gold rated green building status through incorporation of various "green" design principles based on world class benchmarks and procedures. The project is also registered under Clean Development Mechanism (CDM) under the United Nations Framework Convention for Climate Change (UNFCCC). The project activity involves energy efficiency measures undertaken primarily in the building envelope and heating, ventilation and air conditioning (HVAC) system. The purpose of the project activity is to reduce the emissions of greenhouse gases to the atmosphere due to reduced electricity consumption in the building. Initiatives in design load energy reduction include energy efficiency equipments in HVAC system including Water Cooled Centrifugal Chillers, Air Handling Units with Variable Frequency Drives (VFD) and Heat Recovery Wheels (HRW), primary, secondary and condenser pumps with VFDs and control panel for HVAC system, online Intelligent Building Management System for monitoring of systems for optimization of energy performance, better roof insulation, painting of roof surface with highly reflective albedo paint, use of glazing of low U factor and solar heat gain co-efficient, increase of thermal resistance of the building envelope through insulation and double glazed window panels. The volume of fresh air entering into the building will be modulated based on carbon dioxide (co_2) sensors, located within return air duct of Air Handling Units (AHU) serving each occupied zone. These energy efficiency measures have a high replication potential and `Ecospace´ will encourage other builders to adopt similar measures for an improved environmental quality.

Foamed Lightweight Concrete for Construction of Fast Track Model Flats in Bengaluru by Karnataka State Police Housing Corporation Ltd. (KSPHC)

The Karnataka State Police Housing Corporation Limited (KSPHC) was incorporated in 1985 and has mandate to construct residential and non-residential building for police and allied departments. KSPHC proposed to undertake construction of 40,000 dwelling units during the coming 4–5 years. The existing infrastructure including the technology and resources are not adequate to support such a daunting task. Also the existing technological support does not provide the scope to construct green buildings and its pace is also very slow. The KSPHC objectively started hunting for technologies to support twin objectives of speed of construction and incorporation of green building featurres. After evaluation of several options, the KSPHC selected Expanded Polystyrene (EPS) panel based pre-fab, fast track construction technology from Pearls Mii Home Pvt. Ltd, Australia suitable for local conditions. By using pre-fab fast track construction technology, the KSPHC constructed two model houses in Bangaluru for use of fire officers. The maximum construction period for the model house was 17 days. Model house has features like water heater, light emitting diodes (LEDs), composite doors, modular kitchen, aluminium windows, rain water harvesting and earthquake resistance upto 8.5 on Richter scale. Apart from energy efficiency and lower cost of construction, the house provides thermal and acoustics insulation.

The houses constructed by application of such technologies have environmental advantages by energy saving, reduction of greenhouse gases and entire material is

recyclable. Such houses can save energy for heating and cooling cost to around 30 per cent. The use of water during construction period is negligible. The life of building is assessed for more than 58 years. The other aspects are high resistance to wind, earthquake, flood, fire termites and pests. Based on experience, it is hoped that KSPHC would scale it upto serve the nation better.

Day 7

Day 15

Urban Design and Regional Planning, Inner City Revitalisation and Conservation

Urban Design & Regional Planning by Naya Raipur Development Authority (NRDA), Chattisgarh

Development work for Rakhi Rehabilitation at Naya Rakhi, Naya Raipur

Training Programme For Project Affected People Under Rehabilitation Plan

Chattisgarh was formed as New State on 1st November 2000 and Raipur was named its capital. Green field city of "Naya Raipur" is being developed to serve as the administrative capital of the State and also cater to the infrastructural needs of education, health, industry and trade in the region. Naya Raipur Development Authority is a special area development authority, constituted for the planning and development of Naya Raipur. The development plan covers 237.42 sq kms and 41 villages, out of which core area would be spread over 95.22 sq kms. Naya Raipur was included with the mission city of Raipur under JnNURM in 2007.

City has been selected for BRT Project under Global Environment Facility Scheme of World Bank.

Development plan for the city started from identification of land which was done with the aid and help of national and international experts in the field of town planning and also by scientific evaluation of the site. The land selected was less appropriate for agriculture,

About 80 kms of road network in phase I

mining activities, habitation and has caused minimum loss to forest and wildlife. A training academy namely "Chhattisgarh Nirman Academy" was established for providing training to project affected persons. New colony named "Naya Rakhi" has been constructed for rehabilitation of Rakhi village.

For achieving the goal of providing safe, comfortable and economic access to public transport, NRDA has initiated BRTS project under GEF (Gender Equality Project)-UNDP (United Nations Development Programme) -World Bank Assisted Sustainable Urban Transport Project of Government of India which is proposed to be reviewed in the context of transit oriented development. NRDA has initiated projects to generate solar energy by roof top solar panels above the Mantralaya and HOD buildings at Naya Raipur. To have inclusive development, 51 per cent area is meant for Low Income Group (LIG) housing and EWS (Economically Weaker Sections) and only 11 per cent housing is to be developed for higher income group and 38 per cent for middle income group. 80 kms long 4 lane roads have already been laid and work of sewerage and water supply has started. State Secretariat Building is nearing completion and HOD building is at advanced stage of construction. 2665 dwelling units (DUs) in

Lake Conservation in Naya Raipur

Hariyar Chattisgarh Maha Abhiyan-A mass tree plantation in Naya Raipur

Sector 27 are nearing completion. Under JnNURM 888 DUs for urban poor are under construction in 11 villages. Section of developers of Sports City, Amusement Park and Knowledge Park are under process. NRDA provided equal sustainable urban platform to local inhabitants through training for upgrading the skills and preventing land bank speculation through strict land disbursement policy. NRDA has created an example for reducing dependence and load on non-renewable resources through plantation of 10 lakhs trees, waste water management and optimal use of land. NRDA is a member of various organisations including the Euro Asia Sustainable Towns (EAST) which promotes and guides the planning, construction and management of new towns and satellite cities in Europe and Asia.

Revitalisation & Rejuvenating Of Urban Spaces by M.P. Housing & Infrastructure Development Board

Cities and towns all over the state of Madhya Pradesh are growing rapidly and Bhopal is no exception. At the initial stage of planning of the city, Govt. Poultry Farm was developed in the peripheral area of Bhopal for employment as well as requirements of eggs and meat for the city. Over a period of time, the city has grown even 10 - 15 km beyond the Poultry Farm. The planners and city managers felt that it would be more appropriate to shift the Poultry Farm in the outer peripheral area. This kind of argument is found in the literature of development plan of city of Bhopal for the year 1991 and 2005. After approval at highest level, it was decided to utilize 16 hectares of land of the Poultry Farm for housing and other city infrastructure.

Keeping in view the requirements of the city roads with the objective to decongest certain arteries, the planning of 16 hectares has been done. With low rise and low density plan, 306 dwelling units having housing density of 22.4 units (112 persons) per hectares has been planned. Urban design considerations have been incorporated resulted in massing as per the physiography of the land. The buildings that have come up on this project site are G + 2 stories. Part of the area has been built in the name of Rivera Towne and the remaining area is under construction. The quality of infrastructure provided for housing project is excellent. Access from all the three major arteries is available for the development. Looped internal feeder roads are provided to prevent clash of directions. Minimal houses open on to main internal direct roads and pedestrian movement has been designed to be segregated from vehicular movement. Visual focal points and vistas

have been created. The built mass has been kept to the human scale so that streets could be developed. Greens developed along the drain and interspersing the residential area are designed to impart relief. Existing trees are retained to the extent possible. The area is now witnessing a transformation.

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