HUDCO’S HSMI PUBLICATION

HUDCO Awards for Best Practices to Improve the Living Environment

2016-2017

“A Compendium of the Award Winning and other Entries”
HUDCO Awards for Best Practices to Improve the Living Environment

A compendium of the award winning and other entries received for the HUDCO Best Practices Award 2016-17

A HUDCO - HSMI Publication

HOUSING AND URBAN DEVELOPMENT CORPORATION LIMITED
NEW DELHI – 110 003
<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>5</td>
</tr>
<tr>
<td>About the HUDCO Best Practices Award</td>
<td>6</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>7</td>
</tr>
<tr>
<td>Award Winning Entries</td>
<td>9</td>
</tr>
<tr>
<td>• Andhra Pradesh Capital Region Development Authority for Innovative and Inclusive method for procurement of land for the development of Amaravati Capital City.</td>
<td>11</td>
</tr>
<tr>
<td>• Surat Municipal Corporation, Gujarat for Initiatives in Financial Inclusion of urban poor women through linkages with income generation activities.</td>
<td>19</td>
</tr>
<tr>
<td>• Karnataka State Road Transport Corporation Ltd, Karnataka for Initiatives in making the Nation's first intelligent transport system “Mitra” at Mysuru.</td>
<td>25</td>
</tr>
<tr>
<td>• Cochin International Airport Limited, Kerala for developing World’s first Airport fully powered by Solar Energy.</td>
<td>31</td>
</tr>
<tr>
<td>• Directorate of Town Panchayats, Tamil Nadu for Initiatives in making Zero Waste Management in Tamil Nadu.</td>
<td>35</td>
</tr>
<tr>
<td>• Municipal Corporation Rajnandgaon, Chattisgarh for Financial upliftment of urban poor women by engaging them in traditional cotton textile handloom industries.</td>
<td>41</td>
</tr>
<tr>
<td>Other Entries</td>
<td>44</td>
</tr>
<tr>
<td>Contact details of Award Winning Organisations</td>
<td>65</td>
</tr>
<tr>
<td>Team Members and Jury for Selection of Awards</td>
<td>66</td>
</tr>
</tbody>
</table>
Foreword

We will neglect our cities to our peril, for in neglecting them we neglect the nation.

(John F. Kennedy)

The discussion about increasing urbanization, necessarily calls attention to the twin aspects of growth in the population and the increase in geographical area that characterises this increase. The total population of India has grown by 3.4 times during the period 1951 to 2011 but the urban population has grown 6 times during the same period i.e. from 62.4 million in 1951 to 377.1 million in 2011. Similarly, the number of towns/UAs in the 1951 census was 2843, while at the Census 2011, there were 7,935 towns in the country. This increase in number of people and the area termed as urban, plays an enormous role in social transformation and economic mobility, but it also poses an overwhelming management and financial challenge for the citizens and governments. The improvement of the quality of urban environment has become a major priority for urban policy makers and city managers. This requires effective planning and coordination between all stakeholders and at all levels of government.

HUDCO’s mission is “To promote sustainable habitat development to enhance the quality of life”. As a premier techno-financial institution in the country, HUDCO’s contribution is not limited to financing projects, but includes various initiatives for sustainable development. The HUDCO Best Practices Award is one such effort to ensure the development of safe, healthy, and vibrant towns and cities. It is against this backdrop that these practices hold great significance for our country as we move towards an urban future that is truly resilient, inclusive and sustainable.

I appreciate the efforts of HUDCO’s HSMI for bringing out this compendium which documents the best practices in this sector for circulation of ideas and learning. I hope this publication will inspire, inform and sensitize city managers, policy makers and academia about innovative solutions to urban challenges being practiced in different cities that can make our towns and cities more liveable, economically vibrant and environmentally sustainable.

Dr. M Ravi Kanth, IAS (r)
Chairman & Managing Director, HUDCO
About the HUDCO Awards for Best Practices 2016-17

HUDCO launched the “HUDCO Awards for Best Practices to Improve the Living Environment” in 2011-12. Since then, HUDCO has conferred this award on urban local bodies that have demonstrated outstanding initiative to encourage innovative, sustainable and replicable projects for improving the living environment of urban areas. This award is conferred not merely as recognition of their contribution to the urban habitat, but also to encourage upscaling of such efforts and to motivate other city governments and parastatals to replicate these best practices in their own cities. While each solution has stemmed out a problem that is unique to the city and cultural context, there are lessons that can be adapted to address the problems of other cities and cultures.

Entries for the Award were invited under seven categories viz. (1) Urban Governance, (2) Housing, Urban Poverty and Infrastructure, (3) Urban transport, (4) Environmental Management, Energy conservation and Green buildings, (5) Sanitation (6) Urban Design and Regional planning, Inner city revitalization and conservation, and (7) Disaster preparedness, Mitigation and Rehabilitation. A Committee comprising of eminent professionals with diverse backgrounds scrutinized each of the 43 entries received, and recommended 6 practices for the awards, that are not given in any order of preference. The selection criterion is based on the planning and implementation process, innovativeness/ application of technology, stakeholders participation, impact, sustainability and replicability of the practices.

I congratulate all the award winning agencies and other stakeholders who actively participated in this year’s awards. To ensure that urbanization is truly inclusive, equitable and sustainable, there is a need to think and plan for decades ahead. The process of urban transformation is a collective responsibility and I am sure that in the years to come, we will see many more ingenious and creative solutions to the many issues that need to be addressed in urban areas.

N.L. MANJOKA
Director (Corporate Planning), HUDCO

Signed
HUDCO’s Human Settlement Management Institute (HSMI) would like to acknowledge all Institutions – Government, Non-Government and Private, who have responded to our request for submission of entries for consideration of HUDCO Award for Best Practices to Improve the Living Environment 2016-17’. Their participation by way of submitting the entries in the required format has helped us to organize this activity in a time-bound manner and we deeply appreciate and acknowledge their efforts.

We extend our gratitude to Dr M Ravi Kanth, Chairman & Managing Director, HUDCO for his guidance and support extended to the HSMI team as we deeply cherish his enthusiasm and encouragement given to us in carrying out this activity at various stages.

Regional Offices of HUDCO have been instrumental in pursuing with the different agencies in their Regions and in encouraging them to submit the entries and take active participation. We would like to acknowledge the efforts put in by the Regional Heads and teams at Regional Offices for giving their unstinted support.

The Expert Committee of the eminent professionals under the Chairmanship of Prof. Chetan Vaidya has devoted its valuable time to examine and evaluate the entries received. We would like to express our sincere gratitude to them for their guidance and contribution.

HSMI team Coordinator Shri Surendra Kumar (Fellow) and other faculty of HSMI- Smt. Simrandeep Kaur (Fellow), Ms. Nila Pandian (Dy. General Manager), Ms. Sangeeta Maunav (Associate Fellow) and Mr. Swapnil Vidhate (Trainee Officer-Projects) have made commendable efforts to organize the entries received and followed up with the institution at all stages and also in publication of this compilation.

Dr. D Subrahmanyam
Sr. Executive Director (Training), HSMI
Categories of Best Practices Award

- URBAN GOVERNANCE
- HOUSING, URBAN POVERTY AND INFRASTRUCTURE
- URBAN TRANSPORT
- ENVIRONMENT MANAGEMENT, ENERGY CONSERVATION AND GREEN BUILDING
- SANITATION
- DISASTER PREPAREDNESS, MITIGATION AND REHABILITATION
Award Winning Entries
SUMMARY

Amaravati, the People's Capital city of the newly formed State of Andhra Pradesh, is in the making. Founded on a vision of emerging as ‘a smart, green and sustainable city’, it spreads over an area of 217.23 sq.km covering 29 villages inhabited by almost 1,20,000 people of the Guntur district along the banks of the river Krishna. The foremost challenge in the city building process that lay ahead for the city makers was 'Availability of Land'. The 'Andhra Pradesh Capital Region Development Authority' (APCRDA) established under the APCRDA Act, 2014 has adopted the 'Land Pooling Scheme' (LPS) as the best approach to address this challenge. The Amaravati Land Pooling Scheme is founded on procurement of land for the Amaravati Capital City by voluntary consolidation and surrendering of land for returnable developed residential/commercial plots along with other benefits. It has so far amicably converged the aspirations of the land-owners and the State. The Land Pooling Scheme envisages least displacement, maximum concurrence, unparalleled economic benefit and above all, a vibrant social and equitable future for the existing land owners as well as landless families to enable them to voluntarily come forward and be partners in the development of the Capital City.

CONTEXT

The core of Amaravati has been planned to be built on 33,000 acres of land owned by individual farmers between Vijayawada and Thullur along the banks of the Krishna River. The quintessential concern for the government was to make the agricultural land available for city development. The Land Acquisition Act, 2013 mandates certain safeguard measures to be followed including a ‘Social Impact Assessment’ by an expert committee and a detailed plan for rehabilitating the original owners. This makes the land procuring process time consuming and opens room for contentions. Hence, the Government of Andhra Pradesh adopted the Land Pooling strategy. As a deviation from the conventional ‘Land Acquisition’ approach adopted by Governments to procure land for development, in the ‘Land Pooling’ approach, land owners voluntarily sign their ownership rights to a single agency or Government. After developing the pooled land, the agency/Government returns a smaller portion of it to the original owners. However, owing to the value additions to the developed land, its price rises to match the market value, this besides associational benefits that comes by as compensation both for owners and tillers of the soil. Land pooling, therefore mitigates resistance from land owners, facilitates their participation in the city building process and renders the process of making land available for development, both efficient and economical.
**DELIVERABLES**

1. Land availability vide Voluntary land pooling
2. Compensation to Land Owners
3. Welfare Measures for Project Affected Families

**MILESTONES**

<table>
<thead>
<tr>
<th>DATES</th>
<th>ACHIEVEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>August, 2014</td>
<td>Announcement of new capital</td>
</tr>
<tr>
<td>September, 2014</td>
<td>Capital city location finalized</td>
</tr>
<tr>
<td>March, 2015</td>
<td>33,000 acres land pooling completed.</td>
</tr>
<tr>
<td>April, 2015</td>
<td>Amaravati named the Capital City</td>
</tr>
<tr>
<td>February, 2016</td>
<td>Final Master plan notified</td>
</tr>
<tr>
<td>March, 2016</td>
<td>Land Pooling Scheme Development Plan</td>
</tr>
</tbody>
</table>

**RESOURCE MOBILISATION**

The investments made for establishing infrastructure are being met with funds from financial institutions such as HUDCO, World Bank and Government Grants. Loan servicing and repayment funds will be met through a well-structured financial model, which includes land monetization at appropriate times.

**PROCESS**

**Public Consultation and Grievance redressal**

Extensive consultations with more than 25,000 stakeholders were held both at the individual level and the village prior to formulating the Land Pooling Scheme. Important issues that were discussed include among others impact of land acquisition on the livelihood of the people and compensation as per LA R&R Act, 2013. The consultation methods adopted include organizing melas, holding Gram-sabhas, setting up help desks and call centres. Competent Authority Units headed by Deputy Collectors from District Administration, established as part of the implementation mechanism also acted as Grievance referee Officers to deal with complaints related to land pooling. Findings, suggestions and opinion of people have been taken into account while preparing the Compensation and Impact management plan. Certain provisions such as providing annuity to those who are dependent on lands coming under land pooling, and waiver of agricultural loans were incorporated as an outcome of the consultations.

**Scheme implementation**

The focus of the scheme was voluntary land pooling by land owners/farmers. The LPS implementation involved conducting socio-economic survey, issuing notification, receiving consent of farmers, finalizing compensation package, confirming title and execution of agreement for conferring ownership rights, finalization of City Master plan, Layout finalization and allotment of plots, issuance of Ownership certificate and commencing infrastructural development.

The capital city development being the foremost priority for the Government, the monitoring and accounting exercise was carried out periodically by an Executive Committee headed by Principle Secretary to Government, which in turn was reviewed by the APCRD Authority, chaired by the Hon’ble Chief Minister.

**Implementation of welfare measures**

Welfare measures include - Social benefits, skill development, free health, free education, one-time loan waiver to the participants of the scheme as well as all other eligible residents of the Capital City area.
## OUTPUTS & OUTCOME

### i. Compensation for Land

<table>
<thead>
<tr>
<th>LAND</th>
<th>CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DRY</td>
</tr>
<tr>
<td><strong>Patta (Private)</strong></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>1000 Sq.Yds</td>
</tr>
<tr>
<td>Commercial</td>
<td>200 Sq.Yds</td>
</tr>
<tr>
<td><strong>Assigned lands (Land assigned to certain categories of individuals)</strong></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>800 Sq.Yds</td>
</tr>
<tr>
<td>Commercial</td>
<td>100 Sq.Yds</td>
</tr>
<tr>
<td><strong>Annuity Payments (for all categories)</strong></td>
<td></td>
</tr>
<tr>
<td>Yearly payment for 10 years (Rs)</td>
<td>Rs. 30,000</td>
</tr>
<tr>
<td>Yearly increase (Rs)</td>
<td>Rs.3,000</td>
</tr>
</tbody>
</table>
### ii. Socio-Economic Benefits

| **PENSION** | To provide pension of Two thousand five hundred rupees per month per family for a period of ten years to all landless families through a Capital Region Social Security Fund. |
| **LOAN WAIVER** | To provide one-time agricultural loan waiver of up to One lakh fifty thousand rupees per family to farmers as per prescribed procedure of Government. |
| **HOUSING** | To issue possession certificates in village sites in order to enable the occupants to regularize house sites. To provide housing to houseless as well as those losing houses in the course of development. |
| **LOANS** | To provide interest free loan of up to 25 lakhs to all the poor families for self-employment. |
| **EDUCATION AND HEALTH** | To provide free education and medical facilities to all those residing as on 8th December, 2014. |
| **OTHER SOCIAL AMENITIES** | To establish old age homes, NTR canteens (subsidized public canteen) and enhance the limit under NREGA up to 365 days a year per family (Rural employment guarantee) |
| **SKILL DEVELOPMENT** | To establish skill development institutions and provide training with stipend to enhance the skills of cultivating tenants, agricultural labourers and other needy persons. |
| **LABOUR OPPORTUNITIES** | To engage tractors belonging to residents for construction activity and issue ownership and transit permission for cutting and sale of teak trees in private lands |
In 60 days, over 25,000 willing farmers have voluntarily contributed land admeasuring 33,494 acres.

42,095 residential plots and 28,637 commercial plots have been handed over to the farmers amounting to 11,602.8 acres of land along-with various benefits to the tune of Rs. 573 crores already paid.

As there is no restriction imposed on transaction of the land, the farmers can sell the land at any time, even during the LPS process enabling many land owners to reap handsome gains. The scheme is based on consent from the farmers, which resulted in high levels of social inclusion. APCRDA has provided multiple options for availing returnable lands, which included option to transfer of ownership to family members in desired proportion. This has encouraged many to transfer ownership to women and contributed in gender equity.

The returnable land is being developed as an integrated layout with smart and state of the art facilities, duly taking into account environmental considerations. The robust institutional framework of the scheme supports the sustainability, accountability and efficiency in implementation of the Land Pooling Scheme.

The initiative has enabled the government to procure the land with minimal upfront expenditure. Subsequent to the land being available with the authority, an interim government complex housing Assembly, Secretariat functions was built in a record 8 months’ time. Works for major access roads have commenced. Civil works in the returnable layouts (LPS layouts) are underway.

The initiative has been a huge successful with consent achieved to pool over 33,000 acres of land in 2 months’ time. As part of the initiative, infrastructure facilities have been upgraded, which resulted in improved mobility, access to services and facilities.

i. The initiative has made significant impact on the lifestyle and living conditions as the communities could become financially

Consultation at various stages of LPS
independent due to increase in the land prices, waiver of loans and improved credit facilities.

ii. The success also resulted in reorienting the implementation mechanism to meet the enhanced expectations of target groups.

iii. The environmental authorities, as part of the environmental clearance have set a series of guidelines to ensure good quality environment is being preserved. Special mention of the land pooling scheme was made, comparing it with the benefits and issues that arise out of traditional R&R.

iv. The initiative was recognized by the Hon’ble Finance Minister of India as an innovative approach and through the budget speech of 2017-18, tax on capital gains has been removed.

v. The success of the entire exercise has resulted in a new identity to the community, confidence to the individuals and a sense of belongingness and satisfaction to land owners.

vi. Upon successful completion of the last milestone of returning the land to the farmers for over 60,000 parcels through lottery, followed by a new registration system, legal disputes are set to decrease resulting in transparent transactions which in turn will unlock huge growth potential of the economy.

TRANSFERABILITY

For any infrastructure project, Land is the main constraint. The Amaravati Land Pooling Scheme has demonstrated that given a win-win model, the Land Pooling Scheme is a viable alternative and can be implemented in short duration with very little legal hurdles.

Several state and central government departments have been constantly consulting APCRDA for advice and replicating the model.
in their projects. In October 2016, officials from MADC (Maharashtra Airport Development Company Ltd.) also visited the state to study the scheme as an important base of the rehabilitation package for land acquisition for the proposed International Airport near Pune at Purandar.

Government of India has invited APCRDA to present this success story in a gathering of Secretaries to the Govt. The World Bank has taken up this case study in its Annual Land Conference. Most recently, the Commissioner; APCRDA has also presented the Land Pooling Scheme in the 2nd Annual Conference of the National Development Bank at New Delhi.

The Work can be replicated by preparing a winning model, after extensive consultation and effectively communicating about the scheme and its ability to realize manifold benefits compared to other alternatives practiced.

**KEY TAKEAWAYS**

As Indian cities expand, land pooling could be the most equitable and acceptable strategy of urban development. Land acquisition, by contrast, often proceeds by force, resulting in the displacement of residents and escalating costs for builders.

While some States have followed land pooling approach, the scale of success in case of Amaravati have become possible only because of extensive consultation, strong leadership, demonstrated government commitments in terms of benefits, plans as well as policies and the aspiration of the farmers to be part of the capital city development. If a new initiative of this scale were to be taken up elsewhere, the above factors shall have to be kept in mind. Handholding the citizens, including proactively attending to their unresolved land disputes have also helped in the success of the initiative. If this exercise were to be remodeled, the end
results of the project may need to be tangibly analyzed to tweak the benefits. If the scale were to be achieved, trained and experienced resources shall have to be made available at site to resolve challenges and provide clarity on the initiative to all stakeholders, which significantly improves the success rate.
SUMMARY

Financial Inclusion is fundamental to equitable socio-economic development of any population. This holds greater value for poor women in particular, as the face the double burden of being poor and the less equal gender. Much thought and action has gone worldwide for fostering gender equity through Financial Inclusion as one of its instruments.

The Urban Community Development Department (UCDD) of Surat Municipal Corporation (SMC) is making significant strides in integrating urban poor women of the city of Surat, a port city in the State of Gujarat, with the formal financial system, with the objective of enhancing their income by generating opportunities and outcomes.

The strategy adopted was to identify economic opportunities for poor women in the traditional cultural practices and the emerging cultural milieu of the region; provide financial access coupled with infrastructure support to enable them to explore such livelihood activities. Moreover, the department of UCD has taken initiatives to bridge the gap between availability of welfare programs for poor and their accessibility. These much simple, yet much required measures are contributing to bringing about significant improvements amongst the poor women of the city and their households.

CONTEXT

Government Intervention towards poverty reduction and socio-economic development through an ‘enabler mode’ has already been instituted in the country. The need was to identify an appropriate entry point and strategy for making the policy and program mandates implementable and reachable to the target population. In response to such a need, the Urban Community Development Department (UCDD) of Surat Municipal Corporation (SMC) identified beneficiaries of Government welfare Programmes that had an initial level of understanding and preparedness for understanding credit operations of banks and collective bargaining capacity that Self-Help-Groups are trained in.

The beneficiaries identified are women from Self-Help Groups formed under Swarn Jayanti Swarojgar Yojana (an erstwhile Poverty Reduction program of the Government of India); the National Urban Livelihood Mission (Ongoing Poverty Alleviation program of the Government of India); Ration Card Holders of the Below Poverty Line (BPL) population; Residents of Economically Weaker sections; Housing schemes of the Central and State Government and beneficiaries of State programs like Mukhyamantri Amrutam and Maa Vatsalya. (a helath initiative for Below Poverty Line population).
Poverty Line Population). The Department of Urban Community Development of the Surat Municipal Corporation therefore utilized the existing resources of the city's poor like their group structures, traditional skills, cultural needs of the city to meet objectives of the existing welfare programs targeted for the urban poor.

**DELIVERABLES**

i. Training to Urban Poor Women  
ii. Financial Assistance through bank linkages  
iii. Supportive infrastructure facilities for sustainable livelihood activities

**RESOURCE MOBILISATION**

The department mobilizes urban poor through Self Help Groups and provides them training based on their interest and skill, linkage with Bank for financial assistance to purchase machineries and raw materials. Surat Municipal Corporation provides infrastructure facilities free of cost to market their products during Rakhi, Ganesh and Navratri festivals.

**MILESTONES**

<table>
<thead>
<tr>
<th>DATES</th>
<th>ACHIEVEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>August, 2016</td>
<td>Rakhi Mela</td>
</tr>
<tr>
<td>September, 2016</td>
<td>Navratri Mela, Ganesha idol Mela</td>
</tr>
<tr>
<td>October, 2016</td>
<td>Garib Kalyan Mela</td>
</tr>
<tr>
<td>December, 2016-February, 2017</td>
<td>Seva Setu Programme</td>
</tr>
</tbody>
</table>

**PROCESS**

A ward wise awareness program was undertaken that lead to an improved understanding of the merits of the Government's initiatives and instilled a feeling of belongingness to the program amongst the people. A summary of initiatives is placed below:

i. **Rakhi-Navratri Mela:**

Under mission Mangalam (Urban) scheme and Deen Dayal Antyodaya Yojana, Self-Help
Groups had been formed. People in these groups had traditional knowledge and skills in handlooms and handicrafts. However, they lacked the financial assistance and appropriate spatial and temporal platform required to sell their products.

Surat Municipal Corporation has organized special seasonal fair/melas like “Rakhi Mela”, “Navratri Mela” at prime locations of the city. Here, SMC provides them a stall/kiosk along with electricity, drinking water facility, security and all other support free of cost to display and sell their products.

ii. Eco-Friendly Clay Idols Mela:

During the Ganesh Puja festivals, Ganesh idols are in huge demand. After the restrictions on plaster-of-paris idols, people’s inclination towards eco-friendly ganesha idols has increased. Hence keeping in mind the huge upcoming market, SMC linked some of its members of Self Help Groups with Eco Friendly Ganesha Idols Mela. Training was provided to these people to make these idols in coordination with Gujarat Matikam Kalakari & Rural Technology Institute (GMKRTI) Department of Government of Gujarat.

iii. Mudra Loan Mela:

Mudra Loan is a Government of India initiative whose purpose is to provide subsidized and easy loans to small enterprises in the country. Under the National Urban Livelihoods Mission (NULM) scheme, Surat Municipal Corporation organized Mudra Loan Melas for small enterprises/non-corporate business to facilitate awareness and access of the scheme to burgeoning micro-entrepreneurs.

iv. Seva Setu Programme:

Seva Setu is a self-effacing social initiative which has been put into practice to support and promote the cause of every individual who is deprived of his/her fundamental rights. Currently, there are many schemes that have been introduced by the government at the Central as well State level, but many a times these do not reach the beneficiaries for whom these schemes have been designed. To improve outreach therefore, this initiative was started, which would serve as a link between the different welfare schemes and the targeted recipients.

This innovative programme was launched by the state government in Gujarat. The aim was to integrate various state level as well as district level schemes and bring them all under one roof and make the process of availing these schemes easier.
SMC organized ward wise seva-setu programmes. Under this activity various services like preparation of Ration cards, Aadhar cards, Ma Vatsalya and Amrutam cards, Senior Citizen cards, Birth/Death certificates etc. were made available to those who had not availed them. Also, they were introduced to various welfare schemes of the government at the same place itself. This programme was conducted by Urban Community Development Department in collaboration with various zonal offices of the Surat Municipal Corporation as well as other Government Departments.

v. **Housekeeping project**

Generally, Government Organizations undertake tendering process for housekeeping work from external sources. However, in special case on experimental base Surat Municipal Corporation has invited interested SHGs for housekeeping activities of UCD department Office and 9 Urban Community Development Centres.

The purpose of this experiment is to provide financial support to SHGs members. The Women SHG members through this work are earning with dignity.

vi. **Garib Kalyan Mela:**

Surat Municipal Corporation organized the Garib Kalyan Mela. Excluded poor people were provided necessary assistance and handholding to access various Government initiatives targeted for them by different agencies. Surat Municipal Corporation identified the beneficiaries, then coordinated with various Government Departments to provide direct benefit of Government Services to them.

vii. **Rojgar Mela**

Surat Municipal Corporation has taken initiatives to provide employment to youth by organizing employment fair in coordination with Employment Exchange Department, Government of Gujarat; Chamber of Commerce and Industries since the last three years. Employers from Surat as well as other parts of the State are invited to the fair.
viii. “SAFAL” (Surat Action For Augmenting Livelihood) Programme:

With the objective of taking care of unorganized workers, Surat Municipal Corporation launched “SAFAL” programme. Under this programme, registration of unorganized workers is done, their skills are mapped and if required they will be put under skill upgradation programme along with proper certification and authentication. With this initiative the registered workers will get a chance of enhancing their skills and which will increase their employment opportunities.

The data base of registered unorganised workers is maintained and uploaded on the SAFAL application and made available to call centre for telephonic support. This application along with the call centre helps service seeker or employer to contact registered unorganised worker for job opportunities.

Under SAFAL, its mobile application and call centre support act as a bridge between service seeker and service provider thereby increasing chances of employability of the unorganized worker.

SMC is working to provide employment to women of urban poor family’s through various projects. One of the newly initiated projects for women is the “Pink Auto” project which dreams to provide employment to women. Surat Municipal Corporation has also taken new initiatives under “Skill India” mission to employ Urban Poor by strengthening them with special skills that are in demand in local industries.

**OUTPUTS & OUTCOME**

i. Rakhi-Navratri Mela
   a. In last 3 years in Rakhi Mela Total 220 SHGs were provided stalls in various market places of Surat.
   b. Total sales in this Rakhi Mela was Rs. 35,17,562/-
   c. In Last 3 years, in the Navratri Mela total 154 SHGs were provided stalls in various market place of Surat.
   d. Total sales in this Navratri Mela was Rs. 34,76,715/-

ii. Eco-Friendly Clay Idols Mela
   a. During last two years, SMC has trained approx. 950 SHG members free of cost and also provided them the platform to sell their products.
   b. SHG members have been able to sell Rs. 84 lakh worth of idols

iii. Mudra Loan Mela:
   a. In this mela, total 309 loans were disbursed amounting to Rs. 99,81,791/.
   b. Out of these 309 loans, 210 beneficiaries were females.

iv. Seva Setu Programme:
   a. 29 Seva Setu programs were organized during December 2016 to February 2017.
   b. In these Sevasetu programs, 65402 beneficiaries were benefited under various schemes/services of Central Government, State Government and Surat Municipal Corporation.

v. Housekeeping Project:
   a. Currently under this experimental project 6 interested SHGs were employed for Housekeeping work
of UCD department office and UCD Centres.

b. The workers were paid according to carpet area of premise to be maintained. This was in the range of Rs.3200 to Rs.8000 per month.

vi. Garib Kalyan Mela:

a. 86,334 beneficiaries were benefited with Rs.74,924/- lacs so far.

vii. Rojgar Mela (Job Fairs):

a. Surat Municipal Corporation has organized 8 Job fairs in which 342 Companies and 11,438 job seekers participated. Out of them 3131 job seekers were provided employment.

viii. “SAFAL” (Surat Action for Augmenting Livelihood) Programme:

a. Currently under this program about 45,000 unorganized workers are registered.

b. Further, database of 10,000 unorganized workers of various categories has been uploaded on the SAFAL mobile application and citizens are able to get benefit from it by contacting them directly.

Another 25,000 workers data will soon be uploaded on the website after the necessary verification

TRANSFERABILITY

While Government initiatives and interventions towards poverty alleviation are across the country, the socio-economic improvements in the lives of urban poor households demonstrated in Surat are getting replicated in other towns and cities of the State.

KEY TAKE AWAYS

1. Approaches and Strategies for economic improvement need to be contextualized in the existing economic and cultural resources of a region as is being done in Surat.

2. Converging delivery of welfare schemes at single location is a major step towards facilitation of poor who are vulnerable both in terms of awareness, ability and time available to go through the rigors of accessing welfare benefits

3. Support for marketing the products is warranted for bringing about sustainable livelihood outcomes.

Hon’ble Minister giving the award to the Winning Organisation
SUMMARY

Public transport that efficiently and economically connects people and places is the hallmark of a good transportation system in a city. This holds greater significance for a 'heritage city' like Mysuru which holds its inhabitants and tourists alike.

Building intelligence into a transport system brings in the convergence of technologies providing a synergetic transformation in the commuter experience. Implementation of Intelligent Transport Systems (ITS) at Mysuru City is a pioneering effort by Karnataka State Road Transport Corporation (KSRTC) to accelerate modal shift from personal use of vehicles to public transport system and lowering pollution levels, by offering high-class services through state-of-the-art technologies. KSRTC's ITS project is a demonstrative project and the first of its kind in India covering entire fleet of City bus services in Mysore.

CONTEXT

Mysore has been chosen for implementing the ITS due to its historical background and tourist activities. A high growth rate in traffic density and medium city size makes the project affordable with a projected 70% increase in the land use profile. Besides, the city of Mysuru with all its modern infrastructural amenities, offers several opportunities to the people to earn their livelihood thus attracting several people from other states for employment, thereby increasing the population of the city manifold. Driving in Mysuru is becoming a nightmare, and parking problems all the more bothersome in urban centers, a high-tech solution in public transport system could usher in a new era for city dwellers with many shifting to the public transport system. Against this background, the solution planned for Mysuru provides was a dynamic passenger information system (PIS) available on public displays at bus stops, bus terminals and even on the Internet. With this facility to be available, one could plan a commute knowing in advance the exact time it would arrive at the bus stand, availability of seats and the time it would take to reach the destination, thus saving on the waiting time at the bus stand and avoiding overcrowded buses.

DELIVERABLES

i. Improved service delivery and operational control

ii. Traveller information to increase modal share

iii. Improved customer convenience and reduced waiting times
iv. Increased Transit service productivity through control room dispatch & operations
v. Reduced response times for incidents.

**RESOURCE MOBILISATION**

The project has been implemented under the Sustainable Urban Transport Programme (SUTP) with financial assistance from World Bank's Global Environment Fund; Government of India’s JNNURM Fund and funds from Government of Karnataka/KSRTC.

**MILESTONES**

<table>
<thead>
<tr>
<th>DATES</th>
<th>ACHIEVEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>17th September 2014</td>
<td>Conditional operational acceptance</td>
</tr>
<tr>
<td>1st October, 2015</td>
<td>Operational acceptance</td>
</tr>
</tbody>
</table>

**PROCESS**

i. **Reaching out to Commuters:**

To enhance KSRTC’s efficient functioning, ITS project is implemented with functions like **Real Time Passenger Information System**. The unique selling proposition (USP) of the project is to provide Expected Time of Arrival (ETA) and Expected Time of Departure (ETD) of buses in real time. This information is provided through:

a. **SMS** - The SMS system provides real-time bus arrival information and scheduled bus availability for the convenience of customers. Commuters can send SMS to a 3 digit Code 161 with prefix MITRA to get the bus stop code, routes going through bus stop, bus stop names on a particular route in a given direction, time of arrival at a given stop etc.

b. **IVRS** - The Interactive Voice Response System (IVRS) provides responses to the KSRTC bus customer queries through pre-recorded messages/operator. The system provides information in Kannada and English specific to Mysuru bus operations and is accessible from mobile or landline phones. Currently, Commuters are calling toll-free no.1800-425-5220 and 0821-2520070 to avail this service.

c. **Passenger Information System Display Boards** - 193 nos. of Passenger Information Display Boards have been commissioned at 111 locations including bus shelters, bus stations, tourist places & prominent places accommodating 2/4/8/10/16 lines of information in both Kannada and English.

![16 lines Passenger Information Display Board at Bus Station](image)

![16 lines Passenger Information Display Board at Bus Station](image)

vi. **Commuter Portal** - mitra.ksrtc.in/. The bilingual commuter portal provides host of information to commuters which include information on usage of various subcomponents of ITS, tracking the bus on GIS map, time table, route details, fare, KSRTC bus services etc.
e. **Mobile Application** – (MITRA-KSRTC-Official APP) is the Mobile App. which provides valuable features like journey planner between any origin-destination pair, facility to track bus on map facility, women's safety feature, alert facility for commuters, time table, tourist information, and fare etc.

ii. **Project Audit**

KSRTC appointed Independent Monitoring & Evaluation Consultants - M/s Intercontinental Consultants and Technocrats Pvt Ltd (ICT) in Joint Venture with M/s. Kimley Horn Consulting and Engineering (India) Pvt Ltd (KHCE), as consultants to capture and evaluate the performance indicators before, during and after project implementation. Temporal surveys were conducted at different periodicity to assess the reach of the project objectives.

Besides, Indian Institute of Science, Bangalore and M/s NCPE Infrastructure India Pvt Ltd. Hyderabad (Independent Review & Monitoring Agency of Govt. of Karnataka) have carried out the project evaluation studies.

**OUTPUTS & OUTCOME**

i. **Discipline and Efficiency in bus operations** - Considerable reduction in incidents of bunching of bus, cancellation of schedules, reduction in rate of accidents, reduction in staff & crew ratio and improvements in driving behavior. Cost benefits on account of savings due to benefits of ITS is estimated at Rs 5.85 cr.

ii. Reduction in **Passenger Wait Time** from 20 minutes in 2012 to 12 minutes in 2016.

iii. Improvement in **Modal Share** of KSRTC buses increased from 39.8% in Mar-2013 to 42.2 % in Feb-2015.

iv. Ministry of Urban Development estimates that post implementation of ITS in Mysore, there will be **reduction in carbon emission** - direct reduction of 46347 tons of CO₂ and indirect reduction of 197839 tons of CO₂ by 2023.

v. **Organized Knowledge & Experience Exchange Workshops** - Over 200 officials
from different organizations have studied ITS functioning. CIRT has trained 167 officials on Mysore ITS

vi. The **Return on Investment** has been highly encouraging as well with cost savings on introduction of project estimated nearly Rs. 6 crores. Achieving substantial reduction of 8 minutes in passenger wait timings as compared to pre-implementation scenario has been testimonial to the success of the project. ITS has been able to achieve and effect shift from other modes to public transport in Mysuru City

### A comparative statement of pre and post intervention scenario

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Parameter</th>
<th>Pre-development scenario</th>
<th>Post-development scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control Room Monitoring</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>IT based Traffic Operations</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Operational MIS Reports</td>
<td>Manual and Partial</td>
<td>System Generated and Comprehensive</td>
</tr>
<tr>
<td>5</td>
<td>Real Time Bus Tracking</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Bus arrival/departure real time information to commuters</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>SMS, PIS, Commuter Portal, IVRS, Mobile App</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>Incident Management in Real Time (Bus breakdown, accidents etc)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>CAD-AVL dispatch of buses</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>IT based Bus Station Management</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>10</td>
<td>Passenger Waiting Time</td>
<td>More</td>
<td>Less</td>
</tr>
<tr>
<td>11</td>
<td>Trip planner option</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>12</td>
<td>Two way communication between bus and control room</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>13</td>
<td>In-bus display, Audio announcement, Bus shelter/platform display systems</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>14</td>
<td>Tool to rationalize schedules, optimize schedules, crew management</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>15</td>
<td>Schedule Replay</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>16</td>
<td>Tool to defend Motor Vehicle Cases</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>17</td>
<td>Real time alerts</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>18</td>
<td>Bunching of buses</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>19</td>
<td>Punctuality of trips, schedules</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>20</td>
<td>Control over schedule adherence</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>21</td>
<td>System driven monitoring of Driver duty behaviour</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>22</td>
<td>Tool to reduce Over Time hours</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
TRANSFERABILITY

Mysuru ITS plays an important role in shaping the future ways of mobility and the transport sector. KSRTC has arranged multiple technical visits and knowledge exchange workshops for helping the other State Transport Undertakings in the country to replicate the project in their respective area. The city of Mysuru is serving as an example for sustainable transport solution of Intelligent Transport Systems (ITS) that is expected to be replicated across India. Spurred by the success of Mysuru ITS, GoI has sanctioned financial assistance covering 25000 buses in the country to operate ITS enabled buses. KSRTC implemented Vehicle Tracking & Monitoring System (VTMS) in 2000 buses; ITS in 1739 buses across 37 cities in Karnataka and plans to rollout VTMS in 16000 buses.

Moving forward, KSRTC will be opening up its ITS data feeds helping Startups and other businesses to harness the data to devise new services that not only boost commerce, but also spur KSRTC’s ridership. Mobile software solution providers can create apps that integrate maps with bus stops, enabling commuters to better plan trips. Mysuru ITS project featured in the article published by World Bank Group - “What Makes a Sustainable City?” – A sampling of Global Case Studies.

KEY TAKEAWAYS

Improvement in reliability of public transport systems requires effective travel demand management; emergency management and reduction in waiting time measures. An Intelligent Transport System must meet the essential criteria such as Availability, Accessibility, Assessment and Acceptance of all Stakeholders to assure patronage towards the public transport system.
Vehicle mounted unit (VMU)
- Transmit location details
- Sends alerts
- Provides communication channel
- Controls display + audio units

Amplifier/Audio Unit
- Announce current, next stop details
- Communicate with control station

In-Bus Display Unit
- Displays current & next bus stop details
- Displays messages sent from control station

VMU Battery Backup
- Provide power to VMU even when bus battery is disconnected

Schematic diagram of ITS component inside the bus

Hon’ble Minister giving the award to the Winning Organisation
COCHIN INTERNATIONAL AIRPORT LIMITED, KERALA

The Best Practice Award under the Category of “Environmental Management, Energy Conservation and Green Building” has been awarded to Cochin International Airport Limited, Kerala, for its initiatives in developing World’s first Airport fully powered by Solar Energy.

DEVELOPING WORLD’S FIRST AIRPORT FULLY POWERED BY SOLAR ENERGY

SUMMARY

Cochin International Airport is the first green field airport in the country built with public-private partnership. The airport has been acclaimed for setting a novel idea in infrastructure development. The astonishing public participation, relentless support from NRIs and an effective leadership have made Cochin International Airport Ltd (CIAL), the company that built and operates the airport, an international brand. The airport became power neutral in August 2015 and has been acclaimed as the world’s first airport fully powered by solar energy. This idea has fetched the airport the sobriquet, ‘GREENPORT’.

CONTEXT

The airport’s vision for development drew inspiration from its penchant towards building a green culture and nurturing green habitat around it that integrates nature, culture and community. The airport encompasses an area of approximately 1300 acres spread across four panchayats and one municipality. About 1.5 lakh people live here. Since inception the airport has been performing a pivotal role in scaling up the standard of living of these people.

As an organization which successfully pioneered cost-effective ways of building and operating an airport, CIAL’s solar projects have got larger implications. As the airport operates 24 X 7, the power bill was very high. This provoked an alternative thinking. It experimented with a 100 KWp solar power plant in 2013 and then scaled up the installation capacity to 1.1 MWp. The success of these plants prompted up-scaling of operations. As the initiative demanded more operational focus both in technical and human resources verticals, a special task force has been formed and put into action.

DELIVERABLES

i. World’s first airport fully powered by solar energy

ii. Over the next 25 years, this green power project will avoid carbon dioxide emissions from coal fired power plants by more than 3 lakh metric tons, which is equivalent to planting 3 million trees or not driving 750 million miles

iii. At present CIAL is generating total 29.5 MW power and is in the progress of installing another plant of 7.50 MW capacity by the end of this financial year. Therefore the total capacity will become 37 MW, which will make the new terminal not only self sustainable but can also supply the surplus power to the grid.
MILESTONES

<table>
<thead>
<tr>
<th>DATES</th>
<th>ACHIEVEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; March, 2013</td>
<td>100 KWp solar power installation</td>
</tr>
<tr>
<td>20&lt;sup&gt;th&lt;/sup&gt; November, 2013</td>
<td>Augmented installation capacity to 1.1 MWp</td>
</tr>
<tr>
<td>11&lt;sup&gt;th&lt;/sup&gt; February, 2015</td>
<td>Inauguration of first phase of solar car port (2.1 MWp)</td>
</tr>
<tr>
<td>18&lt;sup&gt;th&lt;/sup&gt; August, 2015</td>
<td>Becomes world's first airport fully powered by solar energy by adding another 12 MWp</td>
</tr>
</tbody>
</table>

RESOURCE MOBILISATION

The project was funded by CIAL itself. The first 100 kWp solar plant was installed by the Kolkata based M/s Vikram Solar Pvt. Ltd. After which the next 1 MWp solar PV power plant was installed by Emvee Photovoltaic Power Pvt. Ltd.

PROCESS

Getting into power neutral mode

CIAL, which has always adhered to the philosophy of sustainable development, ventured into the Solar PV sector during March 2013, by installing a 100 kWp solar PV Plant on the roof top of the Arrival Terminal Block. This was a trend setter in the field of grid-connected solar PV in the State of Kerala. The plant was installed by the Kolkata based M/s Vikram Solar Pvt. Ltd. 400 modules of 250Wp with five 20KW capacity Refu-sol make string inverters were used in this plant. After the successful commissioning of this plant, CIAL installed a 1 MWp solar PV power plant partly on the roof top and partly on the ground in the Aircraft maintenance hangar facility within the Airport premises. This plant was installed by Emvee Photovoltaic Power Pvt. Ltd. 4000 mono-crystalline modules of 250Wp with thirty three 30kW capacity Delta make string inverters were used in this plant, which is the first Megawatt scale installation of Solar PV system in the State of Kerala. Both these plants are equipped with a SCADA supervisory control and data acquisition system, through which remote monitoring is carried out.

Inspired by the success of the above plants, CIAL decided to set up a larger scale 12MWp solar PV plant as part of its green initiatives. This would come up in an area of about 45 acres near the International Cargo premises. The work has been awarded to M/s Bosch Ltd. The project components include PV modules of 265Wp capacity manufactured by Renesola, and Inverters of 1MW capacity manufactured by ABB India. After commissioning, this installation generated around 48000 units per day, which along with the electricity generated from the existing 1.10 MWp plants, was sufficient to meet the power requirement of the Airport. The work started in January 2015 and completed in August 2015. On 18th August, it was declared world’s first fully solar power operated airport. This is a grid connected system without any battery storage and a power banking module which has been worked out with the Kerala State electricity board (KSEB); wherein, CIAL gives as much power as it produces (in day time) to (the grid of) KSEB and buys back the power from them when needed (especially at night). This plant will produce 18 million units of power.
annually which is the power equivalent to feed 10,000 homes for one year.

With the commissioning of the new International Terminal building T3, Airport’s requirement is expected to increase to more than 1 lakh units a day. In order to maintain the airport’s status as a fully solar powered airport, CIAL has taken steps to increase the solar capacity from 15.5 MWp to approximately 30 MWp. CIAL has incurred approximately Rs. 30 Crores for this first phase of expansion. The second phase of expansion consisted of increasing the capacity of solar carport to 2.7 MWp which will provide solar roofing for 1400 cars at the Airport. This is expected to be the biggest solar carport in our Country and also the biggest in any airport in the world. Also a 6 MWp canal top solar installation is fast progressing on the south side of the airport.

**OUTPUTS & OUTCOME**

After the commissioning of the 12 MWp capacity solar plant on the 18th of August 2015, Cochin International Airport became the first airport in the world to be fully powered by solar energy. By the end of 2016, the total solar capacity of Cochin Airport became 15.5 MWp which is capable of generating around 62000 units of electricity every day. Till date Cochin Airport has produced more than 3.50 crore units of solar energy worth approximately Rs. 24 Crores.

At present, the solar plants set up in different places, like cargo premises, over car park, and over concrete pillars constructed across a canal is generating total 29.5 MW power and they are installing another plant of 7.50 MW capacity by the end of this financial year. Therefore the total capacity will become 37 MW.

These solar plants have so far saved more than 550MT of CO₂ emission contributing to the efforts of CIAL towards minimizing environmental degradation.

**TRANSFERABILITY**

A movement towards sustainable development foremost requires appreciation of the use and resource value of environment and its impact on habitat. In present times, energy efficient buildings are not a matter of choice but a compulsion. The CIAL story was featured by all major International Channels including BBC, Al-Jazeera, CCTV etc. The story became no.1 in the ‘most trending news’ category of Al-Jazeera’s facebook page. CIAL was well appreciated in the global climate change conference held at Paris, in December 2015. It was one of the flagship projects showcased in the India pavilion. The Ministry of Civil aviation has instructed all airports in the country to produce at least 1 MWp power from non-conventional sources. After CIAL’s green initiative made global headlines, airports of other countries and institutions working in alternative energy systems
approached the company. Representatives of airport authorities from countries like Liberia, Vietnam and hundreds of other technical educational institutions from across the globe visited the airport. Extensive training sessions were carried out where CIAL took special care to attend to all of them.

KEY TAKEAWAYS

Reducing Carbon Footprints- CIAL’s green initiative over the next 25 years, will avoid carbon dioxide emissions from coal fired power plants by more than 3 lakh metric tons, which is equivalent to planting 3 million trees or not driving 750 million miles.
DIRECTORATE OF TOWN PANCHAYATS, TAMIL NADU

The Best Practice Award under the Category of “Sanitation has been awarded to Directorate of Town Panchayats, Tamil Nadu for its initiatives in Zero Waste Management

INITIATIVES TOWARDS ZERO WASTE MANAGEMENT IN TAMIL NADU

SUMMARY

Tamil Nadu is one of the most urbanized States in India with 44.04 percent of its population living in urban areas. The population of the Tamil Nadu Town Panchayats, which is the third tier of Urban Administration, is 80,74,628 as per Census 2011. The total area under the Town Panchayats is 6388.20 Sq.km which constitutes 62.56% of the total urban area of the State. Achieving the status of Zero Waste towns for this volume of people and space requires convergence of the will of people and the Government. Directorate of Town Panchayats has demonstrated this will. Through technological support and behavioral change strategies for the citizens, commendable progress has been made in waste management of its 528 towns.

A logo of the campaign has been created and approved by the Government and is being used by all Panchayats. It symbolizes not only waste management and plastic avoidance but also rain-water harvesting, renewable energy, sanitation, as well as tree plantation. As a logical consequence of the 4 Rs, it is ensured that households, commercial and Institutional generators are encouraged for decentralized waste management. Zero Waste House is being encouraged by adopting backyard composting as well as backyard kitchen garden, home composting and roof-top kitchen garden. Gaps in the infrastructure and manpower for collection, transportation, and processing have been identified and interventions are being executed in a phased manner.

CONTEXT

Urban ills impacting environment and health due to inappropriate waste management in growing towns and cities is a cause of concern. Guided by the Government of India Vision 2023 and Swachh Bharat Mission, the Directorate of Town Panchayats is implementing the MSW Rules 2000 (2016 now) in its towns. The 4 principles of ‘Reduce’, ‘Reuse’, ‘Recycle’ and ‘Recover’ set the context for the Directorate to implement Solid Waste Management in its jurisdiction.

i. **Reduce**: Usage of disposables particularly plastic cups, Styrofoam and thermocol cups and plates, multi-layered plastic material should be reduced by switching over to the reusable materials or switching over to bulk packaging. This can substantially reduce the amount of waste generated.

ii. **Reuse**: Waste should be reused at individual or community level instead of discarding.

iii. **Recycle**: Recycling of waste should be practised by segregating at source and separating the wet and dry-recyclable waste.

iv. **Recovery**: Recovery of garden and kitchen waste should be done by Composting/vermi-composting. Food-waste can be recovered by bio-methanization, and mixed dry waste by segregating according to recyclability.
DELIVERABLES
i. Waste Reduction by adoption of 4 ‘R’ Principles.
ii. Decentralized Waste Management
iii. Collection, Transportation and Processing.
iv. Research inputs for problematic waste.
v. Welfare of Workers and Worker Motivation
vi. Communication Strategy for Community based Campaign
vii. Regulatory framework and Enforcement

MILESTONES

<table>
<thead>
<tr>
<th>DATES</th>
<th>ACHIEVEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd January, 2013</td>
<td>Satellite Town-Implementation of Solid Waste Management at Sriperumbudur Town Panchayat</td>
</tr>
<tr>
<td>2nd September, 2013</td>
<td>Constitution of Project Sanctioning Committee to approve the projects under Special Solid Waste Management fund</td>
</tr>
<tr>
<td>3rd February, 2014</td>
<td>Implementation Solid Waste Management Projects in 77 Town Panchayats</td>
</tr>
<tr>
<td>2nd November, 2015</td>
<td>Implementation of Solid Waste Management Projects at 214 Town Panchayats</td>
</tr>
<tr>
<td>8th October, 2016</td>
<td>Implementation of Solid Waste Management Projects at 104 Town Panchayats</td>
</tr>
</tbody>
</table>

RESOURCE MOBILISATION

The program is being funded under a special Solid Waste Management Fund created, Central and State mission programs.

PROCESS

The process for waste management mainly includes three steps:

i. Collection: It has been ensured that for every 150 households, a push-cart is provided for ensuring 100% door to door primary collection from residential areas as well as commercial establishments with one worker being provided for every push-cart. Each waste collector has been given a route chart and the list of the house-holds/ commercials/ institutions in order to systematically collect and also to monitor the names and no. of generators who are segregating/ not segregating their wastes. 10049 SHG members are involved in Collection, Segregation and processing of solid waste, for effective implementation of SWM in Town Panchayats, Proper identity cards are issued to the self-help group members. In addition to this, 6686 sweepers are engaged for street sweeping/Collection of Solid Waste in Town Panchayats. Out of 8288 wards 6175 wards are covered under Door to Door collection.

ii. Transportation: It has been ensured that the door to door segregated collection from commercial areas and bulk producers of organic waste is being taken in a separate trip to the Resource Recovery Park (RRP)
for processing. Similarly the door-to-door waste collected in containerized push-carts from residential areas is being taken to the RRP without mixing, through Secondary transport vehicles.

iii. Processing: Composting is the most used waste management approach and has been conducted since prehistoric times. It is facilitated by the breakdown of organic matter, such as kitchen scraps, green waste, and bio-solids. The finished result can be used as fertilizer for agricultural use. Multiple methods of composting exist, including Windrow composting and vermi-composting. It has often been identified as an important approach for achieving greater sustainability, as the finished compost product has been found to contain high nutrient levels and provide significant savings in farming operations.

OUTPUTS & OUTCOME

i. Waste segregation: In Town Panchayats 2100 MT garbage is generated per day out of which 966 MT is organic waste, 747 MT in-organic waste and the remaining 387 MT is silt waste. The per capita generation of waste varies from 250 grams to 300 grams per day.

ii. Bio composting: Bio composting is being successfully done in 466 Town Panchayats. Every day 100.17 M.T of bio compost is produced by Town Panchayats. A sum of Rs.39.42 lakh is earned by Town Panchayats every month by selling bio compost.

iii. Vermi composting: Vermi composting is also being done successfully in 188 Town
Panchayats. Every day 16.21 M.T of vermi compost is produced by Town Panchayats. A sum of Rs.10.29 lakh is earned by Town Panchayats every month by selling vermi compost. In addition, vermi wash is also being produced in few of the Town Panchayats. Compared to the Bio-manure and vermi compost manure, currently vermi wash is very much in demand

iv. Land Recovery: Town Panchayats have now initiated efforts to recover the land from the landfill sites. For this the S.Kannanur Town Panchayat is practicing a scientific solution (Bio-mining) to tackle the issue and recovered 0.80 Acre of the land area. In addition to this, Chitalapakkam Town Panchayat is also practicing Bio-mining activity to recover the dumpsites.

v. Income generation: In order to generate additional income, livelihood generating activities are being undertaken in Resource recovery parks under Solid Waste Management. Action is being taken by the Executive Officer’s of Town Panchayats in Co-ordination with Agriculture Department for selling the Bio/Vermi compost to the farmers through identified agencies.

vi. Bio-methanation: The innovative projects of food waste to energy generation have been implemented in 5 Town Panchayats namely Viz., Mamallapuram, Sholinghur, Chengam, P.N.Palayam and Uthamapalayam. The energy of the plant is being utilised every day for street lights and cooking. Small Biomethanation plants are also functioning in 11 Town Panchayats namely Papparapatty / Dharmapuri District, Kannankurichi / Salem District, Musiri / Trichy District, Sirugamani/ Trichy District, Puliyur / Karur District, PunjaiThottakurichy / Karur District, PujaiPugalur / Karur...
KEY TAKEAWAYS

i. Communication Strategy for Community based Campaign: No change at a large scale can be brought without a well thought out communication strategy. Information, Education and Communication (IEC) is a necessary but not a sufficient tool to bring about a lasting behavioural change. To translate the knowledge gains of IEC campaign the main strategy used in the Town Panchayats included - imparting leadership training to the key players and opinion makers in the community. Effectively it is expected that the key leaders of campaign have to lead by example. These leaders include Chairman, vice chairman and councillors of Town Panchayat Council, Leaders of SHGs and its federation, Members of Residents Welfare Association, traders association, School/college Eco Club members and HM/Principal, formal and informal leaders. Therefore leadership, role-modeling and interpersonal communication forms the key communication strategy. Thus, in all 528 Town Panchayats, 530 “Swachhagrahis” are involved to run the IEC campaign. However these efforts are supplemented by other forms of mass communication such as use of social, electronic and print media. Use of incentives and disincentives for desired behavioural response is also being implemented.

ii. Regulatory framework and Enforcement: It is realized from other campaigns across the globe that 70-80% of stakeholders can be changed through campaign mode. However the residual population that does not accept the desired behaviour necessary for the campaign require enforcement by empowering the local body to enforce the law. For this purpose, TPs may pass appropriate resolutions and enforce the above strategy in a phased manner. A

TRANSFERABILITY

The Directorate of Town Panchayatshave been able to progressively increase its outreach. To upscale the project, certain categories of waste that are neither reusable nor recyclable; such as multilayered packaging, sanitary napkins, diapers and other residual waste that are used in land fill has to be constantly audited and studied so as to come up with innovative solutions.

To foster up-scaling, measures towards welfare of workers and worker motivation, regular health check-ups, provision of workers safety equipments, incentivizing performance, and fair wages are being ensured.
comprehensive Zero Waste Resolution is being adopted by the Town Panchayats and fines are being imposed on defaulting behaviours such as use of banned plastic carry bags, littering, dumping, non-segregation of waste. Similarly awareness and enforcement of other laws such as Bio-medical Waste Management Rules, E-Waste Management and Handling Rules, Hazardous Waste Management Rules and Plastic Waste Management and Handling Rules are being increased through continuous training programmes.
SUMMARY

Rajnandgaon, located in the central region of the State of Chhattisgarh is known for its rich, exquisite, varied and fine quality handlooms. Weaving is the ancient art and traditional heritage of Chhattisgarh. Handloom weavers of Chhattisgarh have not only preserved the ancient art and traditional heritage of Chhattisgarh but have also glorified rich art and culture of the state at national and international level. Rajnandgaon is one of the districts of Chhattisgarh state in which handlooms are flourishing under various weaving co-operative societies. Under the aegis of the Deendayal Antyodaya Yojana - National Urban Livelihood Mission of the Government of India, Self-Help-Groups of urban poor women in the Rajnandgaon District are receiving skill training in handloom weaving through weavers’ co-operatives; financial assistance for setting up enterprise through bank linkages and marketing support by the State. This approach has the dual merit of uplifting the economic status of poor urban families in the district besides sustaining the handloom weaving industry of the region.

CONTEXT

Rajnandgaon is known for its Bengal Nagpur Cotton Mills. At present, the cotton textile mills have closed down; but the poor workers and their families are still living there. Members of the families belonging to the Bengal Nagpur Cotton Mills are involved in handloom work but have not been able to generate sustainable livelihood out of it. Hence, by connecting these families with their traditional business, the textile business is being extended along with raising the economic levels of these families.

DELIVERABLES

1. Skill Training in handloom weaving to poor urban women
2. Financial support for setting up micro-enterprises through bank loans
3. Marketing support

RESOURCE MOBILISATION

The program is being funded under the DAY-NULM of Government of India.

MILESTONES

<table>
<thead>
<tr>
<th>DATES</th>
<th>ACHIEVEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>December, 2015</td>
<td>Skill Training Commencement – First batch of 100 members</td>
</tr>
<tr>
<td>May, 2016</td>
<td>100 members completed training out of which 60 got wage - employed, 12 took to self-employment through bank loan and 28 got engaged with SHGs</td>
</tr>
</tbody>
</table>
**PROCESS**

The Chhattisgarh State Handloom Development and Marketing Association Limited receives orders to make handloom clothes. For this work, women in the age of 18-35 are selected from the urban poor families and women of Self-Help Groups are constituted under DAY NULM. All these women belong to families who are dependent on daily wages. A joint working group (Shrushi) is being formed by the urban poor women, who cannot establish their own loom. Here they get their committees registered so that they can work and earn collectively.

**OUTPUTS & OUTCOME**

Under the Deendayal Antyodaya Yojana-National Urban Livelihoods Mission, 2015-16 and 2016-17, a total of 100 women were trained by Shri Sai Bunkar Cooperative Committee. After training, about 55 women have received work orders and about 10 women have been provided subsidized loans from the bank to set up their enterprise.

After receiving training through institutions like KN Chanseu, trained women are getting income up to Rs. 300-400 per day with their monthly income ranging from Rs 3500 to Rs 8000, a substantial contribution to a poor household in the district.

**TRANSFERABILITY**

In revitalizing the traditional skill, the government of Chhattisgarh has established a special identity for poor workers. Thousands...
of weavers’ family have added value to their traditional skills. Handloom Textiles are made for Department of Women Child Development, Kotwar’s dress, Ganeshash of Government School (Education Department), clothes of students of Rajiv Gandhi Education and uniforms for various other departments. Other products include: bed sheets, quilts and curtains etc. With the creation of new possibilities from the project, traditional and innovative workmen will get the medium of communication from the new market, and will be able to strengthen their financial condition with self-confidence.

KEY TAKEAWAYS

1. Approaches and strategies for economic improvement need to be contextualized in the existing economic and cultural resources of a region as it is being done in Rajnandgaon.

1. Skill training and financial support for setting up micro-enterprises must be reinforced with marketing linkages for generating economies of scale for any enterprise to sustain.

Hon’ble Minister giving the award to the Winning Organisation
OTHER ENTRIES
SURAT MUNICIPAL CORPORATION (SMC)

Pro-active approach to enhance the satisfaction level of consumers about water supply service in the city of Surat - concept of “VELJIBHAI”

Surat Municipal Corporation (SMC) is a local self-government body established under the Bombay Provincial Municipal Act, 1949. It has a total geographical area of 326.525 sq.km. The city is vulnerable to the effects of climate change and therefore, in 2008, under Asian Cities Climate Change Resilience Network (ACCCRN) program, it has been selected to assess the potential effects of Climate Change. Various studies have been conducted in sectors like water, flood, environment, health and energy. Based on these studies, City Resilience Strategies have been prepared for implementation in the short term and in long term. Water Supply, being a critical municipal service, various measures envisaged under the City Resilience Strategies, are being implemented so that the objective of adequate water supply, in any eventuality, can be fulfilled. In order to deliver in accordance to the Service Level Benchmarking, adequate water supply infrastructure has been established and made operational.

To monitor the satisfaction level of consumer closely and to rectify factors that lead to dissatisfaction, the concept of “VELJIBHAI” – Pro-active approach to enhance the satisfaction level has been established. In the year 2015-16, door to door survey has been done to assess the performance and satisfaction level. Consumers have given valuable feedback and upon analysis it has been found out that more than 84% of the consumers covered by the water supply network are satisfied with the level of service delivery. Also, the department is closely analyzing the factors which have resulted in dissatisfaction.

For administrative convenience, a city is divided into seven zones. Each zone has its own water supply management staff. They include junior/ assistant engineer, leakage inspector, fitter team (leakage repair team), supervisor, technical assistant etc. Moreover, the centralized water supply department has a dedicated team of engineers to oversee the performance of each zone, with respect to the service delivery of water supply. The following priorities have been fixed:

i. Formulation of questionnaire to know the satisfaction level

ii. Establishment of zone-wise team - Junior/ assistant engineer supported by a team of technical assistant/ supervisor who are given the duty of collecting feedback from each zone.

iii. Citizen's representatives in each election ward (Councilors, MLAs, Members of Parliament etc.), citizens living in remote area/ tail end of the city etc. to be covered for taking their feedback (Target Group).

iv. Each engineer in the team (zone wise) was given the name of “Veljibhai”. A total of seven Veljibhai + 1 Veljibhai (Additional City Engineer) took charge of door to door surveys.

The result found out that over 87% of the consumers were satisfied with the service delivery of water supply, and the remaining 13% consumers were dissatisfied and were having complaints mainly relating to
inadequate pressure.

With the help of the feedback, are as for improvement were identified and action was taken for improvements in service delivery (e.g. changes in system / water supply duration/ additional water supply, replacement of old water supply network etc.). This Practice of taking citizen’s feedback for implementing various measures for improvement in service delivery is being adopted citywide. Other essential services like sewerage system and health services were also directed to replicate this practice.

**PUNE MUNICIPAL CORPORATION (PMC) IN PARTNERSHIP WITH CENTRE FOR ENVIRONMENT EDUCATION (CEE) PUNE**

**Participatory Budgeting and decision making**

Pune, with a population of around 4 million, attracts a large number of youth as it is one of the prime education hubs of India. A rare combination of active citizenry, informed political leadership and able administration had informal forums for deliberation and citizen’s engagement. However a need was felt to formalize citizens’ engagement, not only in service delivery, but also in the process of making the budget of the city. Participatory Budgeting (PB) has given citizens a formal forum to engage with the ULB on public works.

The project started with the acknowledgment of the fact that citizen’s participation in demand for service delivery is the key to success. This central idea has helped to evolve different forms of PB in Pune. Citizens can demand for improvement in the basic services like water, sanitation, solid waste management, social infrastructure and sustainable transportation. The process of filling in PB form is simple; however, there is a need to improve the back end systems. In the first year of the project, citizens group were actively involved in the prioritization meetings. However, all works suggested by citizens, could not be included in the budget. There was lack of a feedback mechanism to communicate the status of inclusion or exclusion to citizens. Since 2013, efforts are on to use technology to have better feedback mechanism for suggestion of works and help citizens to prioritize the work using effective online forum. However, this work is in progress and PMC is committed to set these systems.

PMC allots Rs 50 lakh per electoral ward annually. With 76 electoral wards, the total annual provision for PB has been Rs.36 crore (2012-2016). As enabler, CEE has mobilized its own financial resources towards technical support to PMC, to evolve the PB processes, monitoring, building capacities of community facilitators, directly facilitating multi-stakeholder deliberations and prioritization processes in pilot wards, and developing the Ward Infrastructure Services and Environment (WISE) information base.

PMC accounts department anchors PB in Pune, and issues relevant circulars, advertisements and prints PB forms and distributes the same to all administrative ward offices. A team of 5 persons at PMC Accounts Dept (accountants, clerk, steno, and typist) assist the Chief Accounts and Finance Officer at PMC. CEE and Janwani voluntarily take up publicity. CEE facilitates meetings with the weaker sections of society including domestic workers, waste pickers, and SHGs associated with PMC’s Urban Community Development Dept. CEE also monitors the process. At CEE, a programme director guides the engagement with PMC and civil society, a programme officer responsible for liaising with PMC, and other stakeholders. Project staff and community facilitators (typically ranging from 2 to 8) conduct ward audits and facilitate various citizens’ engagement processes.
One of the main challenges faced is the limited outreach as very limited resources are allocated for publicizing PB. PB has provided citizens of Pune a local forum to engage with PMC. This experience has helped Pune Municipal Corporation while competing/showcasing with the other cities in the Smart City Mission. The city has earmarked Rs 36 crore for civic works, suggested by citizens through PB in Pune with more than 50% works getting successfully implemented. In the future, PB can work as a demonstration project of citizens' participation and could inspire elected representatives, city administration or civil society groups to develop their own form of PB. It can also provide a base for the emergence of newer forms of citizens’ engagement using ICT and for the implementation of the Government of India initiative- Plan Plus, decentralized planning system for urban areas. PB can provide a base to implement the Area Sabha provision of the Maharashtra Municipal Corporations Act.

The Transparency and Accountability is also maintained by publishing the selected works in the municipal budget. This helps to track the works to be done in the financial year. It is the responsibility of the ward officers to implement the works mentioned in the budget book.

Participatory Budgeting of Pune has been inspiration for Pimpri-Chinchwad Municipal Corporation and PCMC has also initiated PB process. However, civil society participation was missing, which led to low response to the announcement by PCMC. Some of the ex-associates of the partner organizations are taking forward the learning from PB in their own way and in newer urban areas. CEE has initiated a discussion with the urban development department of the Government of Maharashtra to scale up participatory planning led participatory budgeting in 5 cities of Maharashtra.

**PATNA MUNICIPAL CORPORATION (PMC)**

**E-Governance for Quality Citizen Services**

The Urban Development & Housing Department (UD&HD), Government of Bihar has commenced an ambitious plan to reach out to its citizens by providing integrated end-to-end services utilizing advanced tools of Information & Communication Technology (ICT). The objective is to provide integrated services to citizens in a transparent, effective and efficient manner to ensure a high level of citizens’ satisfaction. The primary goal of the project is to provide municipal services to citizens through online / single window service delivery channel and ensure accessible, convenient, transparent and timely delivery of services. Under this initiative, Patna Municipal Corporation (PMC) has taken a lead role in implementation of e-governance across its complete functioning.

For implementation of e-Municipality in PMC, well equipped Citizen Facilitation Centers (CFCs) have been established, and they are operational in 4 Circles viz. New Capital Circle, Kankarbagh Circle, Bankipur Circle and Patna City Circle in addition to CFC headquarter at Mauryalok. A large number of trained IT resources have been deployed in all offices of PMC for e-governance operations and providing effective & efficient services to stakeholders. Five trained IT supervisors and twenty data entry operators are deployed in PMC for e-Municipality operations.

PMC has initiated the process to make full use of e-Municipality in all aspects of the working of the Corporation. Soon, rent & lease, advertisement & hoarding, legal matters, audit, stores, IT support, questions & answers of legislative assembly and work
flow & document management system will be made operational. One of the major initiatives being undertaken for the implementation of e-governance, is implementation of Personal Management System (PMS).

PMS covers management of information related to all career related details (appointment, promotion, disciplinary action, change of jobs, performance appraisal, and training) of ULB employees. It also covers salary and pension related details & processes of the employees and generation of salary registers and salary slips. This is a major shift from the time consuming manual working to imbibing e-governance into its day to day work.

The collection of property taxes has seen a major improvement due to online property tax module which enables citizens to file self-assessment of properties from their home, make payment through online mode i.e. through internet banking and credit/ debit cards paving way towards digital economy and truly supporting and accepting the Digital India initiative of the Government of India. Further, PMC has deployed 100 Point of Sales (POS) machines and Cash Deposit Machines (CDM) for facilitating better and effective tax collection and reducing cash transactions.

The results achieved are improved access to municipal services through multiple delivery channels e.g. internet, CFCs, mobile phones etc., thereby reducing the number of visits to the ULB’s. Service delivery was also as per time periods specified by the government. It also opened up opportunity for greater participation by citizens in decision-making. It also resulted in better co-ordination between departments and agencies through common information base across departments and creation of effective management information system (MIS). Overall it has resulted in improved governance, delivery of services and citizen interface, mobilization and utilization of resources and revenue collection.

**KARNATAKA STATE ROAD TRANSPORT CORPORATION (KSRTC)**

**E- Staff Duty Rota System & Leave Management Kiosk System**

KSRTC is one of the largest organizations having a staff strength of 37831. Allocation of duty and managing their leave is very critical & sensitive issue among staff members. Staff Duty Rota System and Leave Management Kiosk System is a first of its kind initiative in road transport industry in India introduced by KSRTC. These address the issue of allocating duty and sanctioning leave to crew and mechanics working in depots. Implementing Staff Duty Rota and Leave Management System by KSRTC in all their depots is an effort to bring transparency and increase labour satisfaction by eradicating favouritism and corruption.

**Duty Rota System:**

The duty rota system is completely automated and enables the employee to select their preferred route or their preferred weekly off day, based on their seniority. After generating the seniority list, counseling will be conducted for employees. A duty chart will be prepared accordingly. Based on this Rota, operation will be carried out for the subsequent month.

Counseling will be conducted every month so that the employees can change their preferred duty or weekly off day, if required, or can extend the existing roster for the next month. If any new schedules are introduced then duty rota counseling will be conducted for those routes without disturbing the existing rota.

**Leave Management Kiosk System:**

This system enables the employee to avail of their leave, 30 days in advance, through a user friendly touch screen based kiosk.
Touch Screen based, 24 X 7 staff duty Rota System and leave management kiosk System

system, without waiting for approval of depot manager or other higher authorities. Regional language interface has been provided for employees to avail leave. SMS will be sent to employees mobiles regarding leave approval/ rejection along with generation of acknowledgment receipt in the kiosk. One week duty allocation information can be known through kiosk and SMS of the same can also be obtained. Employees can know their leave balance through the leave Kiosk system.

Only 2% discretionary power has been given to a Manager to sanction leave in case of exigencies to avoid favoritism, delay, harassment and corruption. The depot manager can set the threshold limit (i.e., number of employees who can avail leave) 31 days in advance depending on the crew required for depot operation. Leave account maintenance has become easier now.

Duty rota system ensures punctuality and minimizes operational failure which brings higher customer satisfaction. Availability of staff can be managed by setting the leave quota and preventing the staff from availing mass. These systems also eliminate the scope for subjectivity or partiality in leave management and duty allocation which results in improved industrial relations. It removes the manual intervention in allocating duty and sanctioning of leave by depot manager/depot official. Due to this, staff requirement is reduced and employee turnover is very minimal which results in annual savings. Proper planning of duty allocation avoids repeated duties for crew. The rate of accidents also comes down because of reduced stress, and staff satisfaction level increases as they perform their duty much more safely, on their preferred route.
KUDUMBASREE

Facility Management Center for Cochin Metro

Cochin Metro operates in the Ernakulum district which has a population of 32.8 million. Ernakulum has the lowest workforce participation rate among women (20.21 as against 56.3 among men). To improve this situation, Kudumbasree has entered into a partnership with Cochin Metro Rail Limited, and constituted a Facility Management Center to take over the management and maintenance of the stations of Cochin Metro. The vision is to provide training and employment for women especially those who are needy and disadvantaged.

All the metro stations from Aluvatill Maharajas station will be operated and maintained by Kudumbasree members. Priority has been given to the neediest women who are victims of atrocities, women with differently abled family members, widows etc. The staff of district mission office, Ernakulum have collected application forms and enlisted the priority women. The expenses incurred in recruitment of candidates were met from the plan fund of the state poverty eradication mission. Technical help for conducting the exams as well as evaluating the answer papers was provided by the Center for Management Development (CMD). All staff in the district mission office, Ernakulum were involved in the recruitment. 100 community development centers were utilized for the mobilization of resources, data entry and communication to the applicants.

The project has so far generated employment for 750 women, of which 530 women will receive placements in first phase. The number of women from the disadvantaged sections, who got employment, are:

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women evacuated for Metro construction</td>
<td>5</td>
</tr>
<tr>
<td>People who belong family without income (Aasraya family)</td>
<td>31</td>
</tr>
<tr>
<td>Victims of atrocities</td>
<td>13</td>
</tr>
<tr>
<td>Women in family with no permanent income</td>
<td>112</td>
</tr>
<tr>
<td>Women with family with differently abled people, critical patients</td>
<td>132</td>
</tr>
<tr>
<td>SC/ST</td>
<td>216</td>
</tr>
</tbody>
</table>

The project is envisaged as a service provider for KMRL. The facility management centre will bill the total cost incurred on a monthly basis, with the addition of 12% as administrative costs, to KMRL. This makes the project financially viable and also generates income for the facility management services.

Facility management with only women has huge expansion potential as there will be no middlemen, which will result in cost saving for clients and employees getting more income as there is no commission involved.

The motivation is in line with Kudumbasree’ objective of uplifting women and generating employment for them. Kudumbasree’ vast experience in conducting similar programs and the expertise they have gained has been effectively utilized in the project and has contributed to the success of this project. A project like this will reduce the gap between the unemployment rates of men and women, and if expanded, can create a huge impact in ensuring gender equity.
VADODARA MUNICIPAL CORPORATION (VMC)

Slum Rehabilitation and In-Situ Development under EWS, PPP, LIG and Interest Subsidy Projects under “Mukhya Mantri GRUH (Gujarat Rural Urban Housing) Yojana

The Gujarat government has announced the Mukhya Mantri GRUH (Gujarat Rural Urban Housing) Yojana during 12th Five Year Plan to address the growing need for affordable houses in urban areas. The objective of the state government is to rehabilitate slums in urban areas of the state in the next five years. VMC has decided to construct 11000 houses per year for Economically Weaker Sections (EWS), Lower Income Group (LIG) & Middle Income Group (MIG) in the next five years. Also, 3000 slum dwellers will get houses every year through in-situ rehabilitation of existing slums on public land, by Public Private Partnership Scheme. Under this scheme, tender has been approved for 10232 dwelling units (DUs), against the target of 11000 DUs and work order has been given for 8107 DUs. Under the PPP slum rehabilitation scheme, work has been started for 1593 DUs against a target of 3883 slums.

This scheme mainly prioritizes rehabilitation of the slums in their exact location as much as possible and gives priority to relocate the other slums to closest neighborhood. It also prioritizes providing 75% affordable housing to EWS and LIG people and providing basic and social facilities along with housing.

An Affordable Housing Cell was established in 2014, with an administrative wing to handle the allotment and collection of revenue and a technical wing for the efficient execution of the project. A contractor and project management consultant, was appointed with the scope of architectural planning, structural design, execution of in-situ construction work and overall supervision and handling and management of the project. A third party inspection agency was appointed for quality checking and quality assurance of the scheme.

To carry out this project, VMC adopted a ‘whole city’, approach, to ensure that all slums within the city will be covered irrespective of size of settlement, land ownership etc. A detailed socio-economic survey of all slum households and total station survey of all slum pockets was carried out. A key focus is on provision of water and toilets to all slum houses, and supporting shelter up-gradation in slums where basic services have been provided.

The results achieved were improvement in the living conditions of the community. There were also changes in the involvement of the actors, organization and institutions and capacity transformation of organization, targeted area or community and implementing agency. There were also changes in the local, national or regional, social, economic and environmental policies. With this, the issues and constraints were addressed and recognized both at local, regional and state level. This also encouraged social and economic mobility, gender equity, and social inclusion.
ANDHRA PRADESH STATE ROAD TRANSPORT CORPORATION (APSRTC)

Smart and Affordable Public Transport

The main objectives of the APSRTC are to provide safe, clean, comfortable, punctual and courteous commuter service at a reasonable fare. It strives to achieve financial self-reliance and to attain a position of reputation and respect in society. APSRTC has focused its operations on passenger satisfaction for which it has initiated IT interventions in its operational process. It provides continuous training to its drivers on safe driving, fuel efficiency etc. and plans ancillary activities to increase its revenues by utilizing the existing infrastructure and man power. The loan for modernizing its bus stations, construction of office space etc. was provided by HUDCO.

APSRTC has introduced courier/ parcel services in 2016-17 using the existing bus fleet and earning non-operational revenues. It has already earned Rs. 1221 lakh during 2016-17 which is expected to increase in the coming years. Many technological initiatives have been introduced like online ticket booking, mobile application for ticket booking, bus tracking system on GPRS platform, WIFI facility at major bus stations, introduction of ticket issuing machines in buses, providing high end passenger amenities at all major bus stations. APSRTC has also let out office space at Vijayawada by constructing additional floors on the existing bus station and is receiving rental income from letting out office space, stalls at bus stations, advertisements on buses, and at bus stations. The bus station is being modernized with modern design seating, large LED screens, mini flex theatre in the bus station, shops, children entertainment, dormitory services, food stalls etc. It is also saving considerable energy by using eco-friendly LED lighting in the office premises and the bus stations.

It is one of the state road transport corporation with lowest fuel cost per kilometer in India and was awarded by ASRTU (Association of State Road Transport Undertakings) for fuel efficiency. It is also operates windmill power project in Ananthapur district, the power generated from which is used for Corporation HT connections and selling surplus power to the Andhra Pradesh Power Generation Corporation.

In a competitive environment in the transport sector, revenues from traffic operations alone have become extremely difficult. Realizing this constraint, APSRTC has taken several initiatives to generate significant additional revenues by non-traffic modes. The corporation has several premium located infrastructure facilities such as bus ports. These ports have a foot-fall of several lakhs of people. In addition 12,000 buses are operated covering the entire state. Advertisement rights on bus stations are given to Andhra Bank for city bus-port at Vijayawada.

BILASPUR MUNICIPAL CORPORATION (BMC)

GPS-based City Bus with City Mobility Card

Bilaspur city bus initiative is envisioned as a smart city bus project which integrates mobility, payment and monitoring aspect of public transport under one project. One of the first such initiatives in the northern region of Chhattisgarh, BMC and the state
urban development agency partnered to roll out this project, and today it is operational with 50 buses plying and 3500 city mobility cards in operation. With this 2 state of the art bus depots were also planned and are under deployment.

The grants available under JnNURM and AMRUT were first used as seed money for a PPP based transport model. The other resource that the city leveraged was the availability of profitable routes that would cross subsidize on profitable routes. This is carefully planned and routes are modified through proper legal channels. The PT operators were incentivized by providing a lower tax slab through government notifications. A legally empowered Urban Public Transport Society (a sort of UMTA) has been formed to insulate the Public Transport system from the city functioning.

In this initiative, there have been many hurdles. In the beginning, a stakeholder’s meet was organized to gauge and address the apprehensions of the private sector. The apprehensions were addressed by allotting (i) A platter of profitable routes to cross subsidize the non-profitable routes while ensuring 100% bus availability in each route through strict service level benchmarks (ii) and fixing a lower tax slab for the city bus service (one fourth of the commercial rate) was notified to incentivise public transport. The whole project also required support from three wings of government (i) City Administration (ii) Regional Transport Authority (iii) Traffic Police. There was no formal umbrella authority that could coordinate these three independent agencies. Hence, an urban public transport society was formed under the chairmanship of the District Collector with the Superintendent of Police as Dy. Chairman, Commissioner Municipal Corporation Bilaspur as Member Secretary and RTO and other senior officers of the district as members. This society has been given all powers to regulate public transport through legal channels and thus the system has been brought under one umbrella body and is insulated from the administrative limitations of each agency. There was also opposition from the private operators. The private operators opposed this as it directly affected their profit margin. The umbrella society so formed mitigated that opposition through a planned series of meeting that dealt with unwarranted opposition with a firm hand. The private operators have also been offered a tax rebate for public transport if they adhere to the notified service levels.

The ridership of the city bus has reached over 12000 in the past three months of operation; on the other hand, we can track 2100 cards being utilized daily from the 3500 cards issued until now. These two key performance indices combined, show a very good success rate in tackling the two main priorities of traffic and environment. This will reduce the rush hour traffic at most busy intersections and reduce the pollution levels, and thereby improve the living condition of most citizens. The reduction of travel time by 10-30 minutes daily also provides longer productive hours of citizens, leading to a better livability index of the city. The buses can be tracked by an app and is a great convenience for the citizens to schedule their travel plans.

The model not only provides for an advanced city bus service inside the city but also connects the 8 smaller ULBs and 100 gram panchayats to the city which has led to (i) A channelized transport system for the city’s floating population (ii) Increased economic activity in the city due to easy connectivity (iii) Reduction in traffic density.
SURAT MUNICIPAL CORPORATION (SMC)

Intelligent Transport Management System (ITMS)

A special purpose vehicle ‘Sitilink’, to develop a world-class public transit system, was formed for the implementation of the ITMS. A Comprehensive Mobility Plan (CMP) was prepared which focused on the need for mass transit system in the form of BRTS as a sustainable transport solution. 102 km mass transit network in the form of BRTS has been planned, out of which 99 km is operational. 10 km of High Mobility Corridor (HMC) through the inner ring road to provide easy access to the walled city of Surat is at the planning stage. Also, 234 km of city bus network has been planned to complement BRTS services. The whole system with Metro rail, BRTS, city bus service and HMC is being planned as an integrated service to provide easy movement for people. This integrated service will act as a single ticketing system and provide easy transfers within the system. The whole system will be monitored by the Sitilink.

ITMS features are fully under Sitilink SPV for operation and management. Over the past four years SMC has made an expenditure of Rs.1104 Cr on ITMS infrastructure.

This initiative has made Surat easily accessible. The system is highly inclusive and accessible for people of all groups especially differently abled, women, children and senior citizens. At-level boarding and alighting, ramps, tactile blocks have been provided for safe, easy and faster passenger access. Some of the important features involved in the ITMS are -

State of SMAC (SMArt City) Center:

SMAC (SMArt City) Center is envisaged as an administrative control centre for the city of Surat for effective and efficient delivery of all civic services. SMAC Center will play an important role in providing real time information about civic facility utilization in the city. It will help all the departments in maintaining civic service delivery standards on a day-to-day basis and will give support to the departmental heads for taking quick decisions in restoring services while handling unforeseen disturbing situations. In case of emergency situation, SMAC Center will play an important role in coordinating all departments with decision support system for effectively managing rescue and relief operations.

State of Art ITMS System and Integrated Traffic and Mobility Administration Center (IT-MAC):

Sitilink manages urban mobility services through City Control Centre. Currently it is tracking only BRTS and city bus services while in the long term it is proposed to be converted into IT-MAC centre. This center will house various departments/entities involved with managing city traffic and mobility like BRTS, city bus, traffic police, RTO, fire, emergency services, etc. IT-enabled applications will help all the concerned agencies to co-ordinate and support each other for smooth traffic operations. SMC has intelligent transit system for BRTS, which will be extended to the city bus operations. This will offer real-time vehicle location and passenger information. SMC is using Adoptive Traffic Control System (ATCS) in BRTS, which will be extended to all major traffic junctions. Surat city has a network of more than 600 CC surveillance cameras, which will be expanded to all major locations in the city with the IT-MAC. All stakeholder agencies like BRTS, City Bus, Traffic Police, RTO, Fire & Emergency services, utility services, etc. will co-ordinate, share and act on an integrated platform through the IT-MAC. Citizens will be connected through variable message signs,
website, mobile app, mobile alerts and social media.

**Ensuring city services for end users:**

Sitilink with ITMS service provider regularly checks various reports of trip adherence, schedule adherence, speed violations, skip stop, passenger and revenue report. Also, regular inspection is done to check health of ITMS equipment.

The results achieved were improvement in travel speed with increase in passenger ridership, where public transport ridership has increased from 28,000 passengers to 1,08,000 passengers (BRTS plus city bus). It has also increased service reliability with 95% on time arrivals/ departures. There is also a major reduction in accidents as driver’s speed is regularly monitored by ITMS – AVLS.

**KARNATAKA STATE ROAD TRANSPORTATION CORPORATION (KSRTC)**

**VEHICLE TRACKING & MONITORING SYSTEM (VTM)**

KSRTC’s vision to introduce the Vehicle Tracking & Monitoring system & Passenger Information System (VTMS) project is for providing safe and secure services to commuters and to improve its capability to manage the public transport system more efficiently, safely with a commuter friendly approach. VTMS Project aims to improve the reliability of KSRTC services through effective operations, travel time management, incident management and reduction in the waiting time of the passengers at bus stations.

VTMS is an integrated system for automatic vehicle location and monitoring from central control station. Core technologies include GPS receiver located in VMU which determines the vehicle location, position reporting implemented through a GSM network and supporting information and communication technology infrastructure in terms of hardware and monitoring equipment.

VTMS project provides real-time location of the vehicle through GPS device (Vehicle mounted Unit-VMU), ETA, ETD, number of seats available in vehicles at the source bus station that allows commuters to plan their trips better, complete picture operations and utilization of existing infrastructure for running advertisement campaigns.

**Key Outcomes of the Project:**

With VTMS, the staff at various levels at KSRTC shall be able to plan the schedules, allocate personnel, track the compliance through a monitoring system and then initiate corrective action where required. For this, a mechanism of scheduling and re-scheduling is evolved.
With intelligent passenger information system units at bus stands providing information on bus trips, schedules and estimated time of arrival/departure, commuters enhance their productive time with no idle time at bus stands.

As all these are well-established communication lines between vehicle, control station and bus stands, the ability to manage operations will be enhanced in the event of any emergencies en-route saving property of KSRTC (in events such as riots en-route) and help to reach the destination in pre-determined time.

The introduction of the VTMS system has resulted in more efficient transport management, real-time dissemination of information to passengers regarding bus services at bus stands. This will enhance reliability of public transport services and encourage people to use the public transport system.

KSRTC has implemented Vehicle Tracking and Monitoring System (VTMS) in 2000 buses, and Passenger Information System in 27 major bus stations that help effective and efficient management of operations, and passengers' satisfaction at large, under the “Central Assistance for Strengthening Public Transport System” Scheme of the Ministry of Road Transport and Highways, Government of India.
AHMEDABAD URBAN DEVELOPMENT AUTHORITY (AUD)  

Rooftop solar system installation in EWS housing projects

AUD has taken a lead role in providing social & economically weaker section housing in Ahmedabad periphery area. AUD has been proactive in new and adoptable practices in this field which can offer long lasting, structurally safe sustainable and livable affordable housing projects. There has been consistent problem of common area maintenance in EWS housing projects, especially electricity billing of common areas. In order to reduce the load of electricity bills of common areas, AUD has initiated roof top solar energy conservation project in line with GEDA (Gujarat Energy Development Agency) policy.

AUD got registration from GEDA for about 87.75 KW power generations though solar roof top. GEDA provided subsidy of about 26 lakh for a EWS project with 588 units and 2 other EWS projects containing 812 units and 1120 units.

By using roof top solar plant, it is in process to generate the power from each 1 KW panel i.e. 90% of the capacity up to next 10 years. After 10 years, 85% of power will be achieved for next 15 years which together will result in 25 years savings in common amenities power consumption through solar power plant. As the contractor is selected through tendering for next 10 years O&M, end-users will get maintenance free savings towards power consumption.

In the beginning, two projects of 1708 dwelling units of seven storied EWS housing colony under MMAY scheme will have benefit for common utilities like street lights, lifts, and overhead water pumping utility. Their total electricity bill for these utilities will be settled against electricity units generated by solar system. This will be sustainable long term benefit to urban poor who are allotted housing under Pradhan Mantri Avas Yojana as well Mukhya Mantri Avas Yojana. AUD has decided to implement this system in each and every housing project undertaken for economically weaker section scheme under PMAY and MMAY. This way AUD’s initiative will cover major section of beneficiaries. This will be a project using non-conventional and eco-friendly energy which will help to earn carbon credits in future.

MYSORE NIRMITHI KENDRA

Green School for Young Minds using Mud-Bamboo-crete (MBC)

The Integrated Tribal Development Agency in Karnataka is constructing anganwadis for the tribal communities in the middle of the forest. In pursuit of promoting alternative/green technologies, Mysore Nirmithi Kendra adopted a multi stakeholder approach and utilized the opportunity of constructing anganwadi schools in the forest, to promote bamboo & mud based construction methodologies. It engaged professionals from various backgrounds to arrive at a holistic solution involving natural building construction (with focus on mud-bamboo-crete walls), remote solar installation, rain water harvesting and storage, fuel
efficient cooking stove and other sustainable technologies.

Bamboo emerging as a material of future was considered as a natural choice for such a structure. By infusing appropriate technology, bamboo and mud construction methodologies have been revitalized in the local surrounding thereby greatly reducing the use of cement and steel for dwelling units.

The forest department was engaged for ensuring smooth supply of raw materials (bamboo and mud) for the project. The local tribal people were engaged in the harvesting, transportation of bamboo and mud plastering activities. They were also trained in solar installations, rain water harvesting and other sustainable technologies. The lifespan of the structure was designed to be around 15-20 years and all the elements (flooring, roofing etc) were designed accordingly. Limited power tools were used throughout the life cycle of the project and it was predominantly hand tools and manual labor used during the construction process. The duration of the project was planned accordingly (2 months per unit). As it involves natural materials, the seasonal behavior had to be considered during the project scheduling stage itself. The structural work was undertaken in parallel and the final mud plastering process was undertaken during the spring and summer seasons. The design considered the outdoor lifestyle of the tribal communities and provided play areas (made out of bamboo) and outdoor learning opportunities. The structure was painted with red soil and strived for balance between modern and tradition in the look & feel of the finished structure.

On seeing the success of the project, the local administration made a detailed documentary for the policy makers to take it to the state and national level. The project is successful in terms of sustainability as can be seen in the different parameters –

**Renew ability:** The raw materials (bamboo, mud etc.) used for the construction are highly renewable and reusable.

**Environmentally Friendly:** The carbon footprint of the building is very low because of the use of locally available materials. The embodied energy of the entire structure is very minimal compared to any other contemporary structure.

**Cultural:** As the building form and construction methodologies closely resemble their traditional methods, the tribal communities adopted the technology transfer smoothly. The Anganwadi design was seen as a natural extension of their heritage.

**Bellary Nirmithi Kendra / building centre for promoting sustainable eco-friendly green building materials & construction practices in rural and semi-urban areas**

Nirmithi Kendra is non-profit organization (NGO) working for the promotion/transfer of cost effective & eco friendly technologies, functioning under the district administration of the Government of Karnataka. This organisation promoted application of innovative, cost effective & sustainable environmental friendly construction technologies in the construction of houses, schools, socio economic-cultural buildings and infrastructure development works in rural & semi-urban areas of Bellary district of Karnataka.

Main focus of the best practice is:

**Training & Awareness Activity:**
- Organizing skill development programs for work inspectors, masons.
- Arranging interactive sessions on eco-
friendly building materials, for faculty of local construction Industry.

- Demonstrating usage of alternative building materials & technologies in live projects, to the local public and fresh engineers.

- Initiated the program of conducting PMAY-Grameen skill upgradation & vocational training program in construction related jobs creation.

Production of Green Building Products & Transfer of Technologies:

Promoting technology transfer activities, such as production of eco-friendly green building products using waste material/industrial by-products like fly ash, pond ash & GGBS (Slag), construction & demolition waste, through skill upgradation of unemployed rural and semi-urban youth.

Cost effective & eco-friendly green building technologies adopted by Bellary Nirmithi Kendra in the works of different departments of government are being widely accepted. Also the qualities of fly/pond ash products of Kendra are being accepted by the private sector. Consequently, Nirmithi Kendra is able to cope with the demand and it has achieved the self-sustainable model which could replicated elsewhere. Another reason is the quality aspect which is not compromised in Nirmithi Kendra. There is greater confidence among the rural households about Nirmithi Kendra products and also quality of work executed. Cost effective, eco-friendly green building materials being manufactured by Bellary nirmithi kendra are:

- Fly ash + pond ash concrete blocks,
- Fly ash+ pond ash concrete interlock blocks
- Ferro cement ventilators
- Sign boards
- Garden benches
- Precast RCC toilet components including perforated pit rings.

Nirmithi Kendra concept is really worth emulating for technology transfer. The Kendra has achieved its sustainability by executing work using low cost, eco-friendly green building products from its own production unit. The Kendra has generated enough surpluses for incurring all expenditure including staff salaries & payment of all admissible taxes. The Kendra has generated a surplus of Rs. 297.23 lakh which is kept as a reserve fund and also for corporate social responsibility program.

Besides these, as part of environmental protection activity Nirmithi Kendra has constructed a house for a blind family. The Kendra has created infrastructure (movable
& immovable) worth Rs.129.39lakh. The staff is being given handsome salaries which is an indication of its sustainability. A robust & efficient management system has been put in place to ensure its sustainability.

**KARNATAKA STATE ROAD TRANSPORT CORPORATION**

KSRTC, one of the largest bus networks in India, is committed to leveraging innovation in its continuous quest to provide excellent service. And one of the priorities of the organisation is to minimize pollution and its impact on nature.

Some of the best initiatives are Prakruthi emission checking squad and Bio-bus. The aim of KSRTC is to ensure safer, greener public transportation for Bangalore, Karnataka and the country at large, for today, and for the future.

KSRTC strives to achieve a better environment management system. As a part of social responsibility, and to maintain environmental standards of vehicular emission KSRTC introduced a novel concept: “PRAKRUTI- For a clean environment”, which means nature in Sanskrit, to clean its vehicular pollution levels.

A first-of-its-kind initiative by any road transport organization in India, “PRAKRUTI-GREEN SQUAD” reached out to the workforce to prevent and mitigate the negative environmental impacts due to air and noise pollution. “PRAKRUTI” is equipped with an advanced smoke emission testing machine and sound level meter to cross verify and regulate the checking conducted at depot and division level. 2461 surprise checks were conducted in 2015-16 and 450 checks conducted during April-16 and May-16.

**GREEN SQUAD:**

A green squad reaches out to its workforce to educate them about the importance of nature care, stands as a testimony to the efforts put down by KSRTC in creating awareness in environmental protection.

**INNOVATION IN USE OF ALTERNATE FUELS**

**BIO-BUS:**

KSRTC for the first time launched 10 biodiesel buses, branded as BIO BUSES on 2nd October 2015, with a vision to respect the Mahatma Gandhi’s philosophy of clean India and clean fuel. It started a pilot project with 10 buses using 20% bio-diesel blended fuel in the existing fleet.

KSRTC began trials of edible oils like ground nut, sunflower, castor oil and non-edible oils like pongamia, at the engine test bed from July 2006. Based on the result of fuel efficiency & smoke emission reduction, 10% blending of Straight Vegetable Oil (SVO) was adopted for one depot.
KSRTC is currently operating around 8200 buses, which if replaced with biodiesel, may give a saving of Rs 5 per litre. KSRTC has been successfully using a combination of biofuel with diesel and ethanol-blended diesel for some of its buses, resulting in significant reduction in fuel emission.

This pilot project resulted in reduction of emission parameters like CO, CO₂, NOx, particulate matter and replaced 5000 lts. of diesel with bio-diesel in a one month trial duration. The plan of extended usage in 1600 buses is under progress and also achieved a saving of 7650 kg of CO₂ with the usage of bio-diesel during 2015-16.

Bio-diesel is biodegradable, non toxic and sulphur-free. This has minimal environmental impact. With a high flash point, biodiesel is safer to handle and store than petroleum and diesel. When made from used oils and fats, biodiesel ensures proper recycling of former waste products.

As the importance of bio-diesel is increasing, farmers are being encouraged to plant vegetable crops and palm trees, along with regular food crops in a multi-cropping pattern. They can also utilise barren and waste lands for cultivation. This will help farmers overcome the loss due to irregular rains. Power, performance and economy make biodiesel a renewable winner. Biodiesel helps reduce pollution and improve health with lower emissions & greenhouse gas reduction, which in turn will help reduce the impact of global warming.

KSRTC - Bio bus
**AHMEDABAD URBAN DEVELOPMENT AUTHORITY (AUD**A**)

**Recycle & reuse of domestic waste water**

When new areas are opened up for development, the implementation of comprehensive city level infrastructure, mainly sewerage and water supply, takes a long time. In this situation, to allow sustainable private development, general development control regulations are necessary, making it compulsory to install grey water treatment systems, for developers constructing more than 100 dwelling units.

Currently any owner applying for approval for construction of a new set of buildings of category and total built-up area shall make provision for reuse of recycled water.

An affordable housing zone with approximately 15 lakh LIG/MIG housing units will be coming up in the future. Such a development would require major infrastructure facilities. The vision is to implement grey water harvesting through development regulations as a part of the project itself.

In case of proposed development of properties, the occupier/developer/owner would come with application of building permission; the developer would have to submit details of proposed ‘grey water reuse system’. The proposal of grey water recycling plant should clearly demarcate the capacity of plant, type of treatment system, location of plant in site layout, overhead storage tank of recycled water, plumbing system and method of disposing residue. The private developer would include the cost into his expenses as the part of total project development.

The process includes-treated grey water to be pumped to a separate tank on the roof from where grey water will be supplied to water closets, garden taps, car washing taps etc. Only water from water closets should be let into the sewerage system. Wherever arrangements for reuse of recycled water is provided, additional arrangements for carrying the excess grey water to the sewerage system may also be provided. The recycled water is strictly for non potable non-contact use, and shall not be connected to sewage/waste water system of local authority. Separate plumbing facility should be made for grey water.

The grey water recycling system is included in general development control regulations of Development plan 2021 which was sanctioned on 20/12/2014. Thereafter it was made mandatory for all buildings, as under:

<table>
<thead>
<tr>
<th>No.</th>
<th>Building Use</th>
<th>Built-up Area (sq. mts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hospitals, Nursing Homes</td>
<td>More than 5,000</td>
</tr>
<tr>
<td>2</td>
<td>Hotels, Lodges, Guest houses</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hostels for Schools, Colleges, Training Centers</td>
<td>More than 10,000</td>
</tr>
<tr>
<td>4</td>
<td>Community Centre, Banquet Halls etc.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Commercial &amp; Mixed use</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Hazardous, water polluting chemical industries</td>
<td>More than 10,000 or more than 100 DU</td>
</tr>
<tr>
<td>7</td>
<td>Residential</td>
<td></td>
</tr>
</tbody>
</table>

In order to save water, AUDA resolved to make provision of sewerage treatment plant compulsory in projects of more than 100 dwelling units that are not having proper underground sewerage connectivity. At
present, 20 housing projects of about 4000 residential units are sanctioned by AUDA with grey water recycling units. Out of these, two proposals have already been issued building use permission, in which treatment plant is fully installed and operational. This recycles about 300 KLD of waste water and eventually saves 250 KLD of clean water.

The above initiative makes the private sector to opt for decentralized waste water treatment plan and eliminates the construction of soak well system. This allows high quality urban development, and at the same time, prevents environmental degradation.

This system of making provisions of recycle and reuse of domestic grey water in general development control regulations has been successful with better solution of domestic sewerage handling system. Most of the cities and peri-urban areas are deprived of city level sewerage system. In such situations, the above practice is necessary and transferable to other areas.

**PATNA MUNICIPAL CORPORATION (PMC)**

**Total Sanitation and Civic Amenities in 350th Prakash Utsav**

Prakash Utsav, was a mega religious event, organized in the City of Patna for the 350th birth anniversary of Sri Guru Govind Singh. More than a million visitors/pilgrims from across the globe, including various dignitaries like the Prime Minister of India, central government ministers, the Chief Minister of Punjab, visited the city during the celebration period (24th Dec 2016 – 5th Jan 2016). The event was a test of the city’s urban infrastructure, to welcome and provide all required civic amenities (sanitation, accommodation, transportation, safe drinking water, lighting etc.) and maintain and manage the gathering of millions, in a very short span of time.

PMC was the nodal agency for providing the key civic amenities and ensuring cleanliness during the entire duration of the ceremony. Sanitation was one of the major focus areas of the Corporation, and this involved engaging various departments, local administration, agencies (government, non-government, private, and public), media, local leadership and the community as a whole.

The Municipal Corporation assessed the infrastructure gap in terms of the equipment for cleaning and managing the waste i.e. waste collection and its disposal as and when it is produced. After the gap assessment, the necessary equipment like dumper placer, auto-tipper, JCB, compactor, tractor trolley, jetting and fogging machine, automatic sweeping machines were procured. Places of waste generation were identified and waste bins (large and small), along with small decorative dustbins, were placed in the whole city. Municipal Cleaning staff were engaged for maintaining the equipment and road cleaning, washing, and sweeping in three shifts round the clock. A large scale anti-encroachment drive was taken in coordination with the district administration to free the roads and pavements and ensure smooth traffic movement, as well as removal of garbage in an efficient manner. It was ensured that the waste collected from garbage bins are directly transported to the landfill site situated outside the city. Apart from this, large scale arrangement of toilets and latrines, both mobile portable and bio-toilets was made in sufficient number, in and around the area where the visiting pilgrims were staying, i.e. three tent cities, established for the visitors in the city. Availability of sufficient water for drinking and other purposes was also ensured. PMC also took a massive drive to fill potholes, maintenance of drains and maintenance of approach roads (laying of PCC). The Corporation also ensured providing other civic amenities like water supply to local residents, street light along roads, pathways
as well as along ROBs (Road over bridges). Other state government agencies like BUIDCO and BRJP also supported in these works.

Sufficient funds were received from the state and the central government. These funds were passed to the appropriate government departments like urban development & housing, tourism, road construction department including PMC which planned allocation of funds through its Municipal Board and Empowered Standing Committee. This ensured active involvement of the ward councilors and other local leaders. They also ensured mobilization of local community to provide support in all respects for success of the ceremony. Initiatives like inauguration of door to door waste collection in some wards, and opening of Rain Basera was also taken up by the Mayor and local leaders. Fines were imposed for encroachment and open dumping of garbage.

To monitor and track all these works, a centralized (interdepartmental) control room was also activated by the state administration. The Municipal Commissioner, himself represented the PMC in the control room. This helped in interdepartmental coordination with minimum delay in implementation of work allocated to the Corporation.

The City Manager was deputed as overall in-charge for each zone to coordinate and manage all the work taken up by the Corporation. Daily work plan was prepared for each zone separately and was communicated to all the supervisors and officers, to ensure that there is no communication gap in coordination of the activities. They were further monitored and supported by six Executive Officers (EOs) who worked in tandem with other department officials and coordinated with the centralized control room. Different Community Based Organizations, NGOs working with the Corporation were also involved in the mega event. Partnership with the media, both print and electronic, was also done for coverage and increasing awareness amongst the common people of the city.

All these helped the event to be highly successful and led to the development of the area (infrastructure) as well as face lift of Patna City. Various Awards were received by the state for successful completion of the event.
## Contact details of Award Winning Organisations

<table>
<thead>
<tr>
<th>Andhra Pradesh Capital Region Development Authority (APCRDA)</th>
<th>Assistant Commissioner, Surat Municipal Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area/Region: Lenin Centre, Govenorpet; City/Town: Vijayawada Pin code: 520002</td>
<td>Surat-395003, Gujarat</td>
</tr>
<tr>
<td>State: Andhra Pradesh Phone: 0866-2577475 Fax: 0866-2577357</td>
<td>Phone (O) 0261-2438628-29, Fax 0261-2451935</td>
</tr>
<tr>
<td>Email: <a href="mailto:sreedhar.cherukuri@apcrda.org">sreedhar.cherukuri@apcrda.org</a> Website: crda.ap.gov.in</td>
<td>Email: <a href="mailto:ucd_smc@yahoo.com">ucd_smc@yahoo.com</a> Website: suratmunicipal.gov.in</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Managing Director, Karnataka State Road Transport Corporation</th>
<th>Managing Director, Cochin International Airport Limited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Office, K.H Road Bengaluru-27, Karnataka State Telephone +91 80 22221125 Fax: +91 80 22226323 Email: <a href="mailto:md@ksrtc.org">md@ksrtc.org</a> <a href="mailto:lathaksrtc@gmail.com">lathaksrtc@gmail.com</a></td>
<td>Area: Nedumbassery Cochin Airport P O, Ernakulam-683111 Kerala Phone: 0484 2374154 Email: <a href="mailto:cs@cial.aero">cs@cial.aero</a> Website: <a href="http://www.cial.aero">www.cial.aero</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assistant Commissioner, Municipal Corporation Rajnandgaon</th>
<th>Directorate of Town Panchayats, Tamil Nadu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rajnandgaon -491441 Chhattisgarh Fax: 07744-404893 Phone:07744-404893 Website:www.mcrjn.com</td>
<td>Area/Region: 4th Floor, Kuralagam Chennai - 600 108 Tamil Nadu Phone:044-25358744, Fax 044-25358742 Email: <a href="mailto:dtpsystem@gmail.com">dtpsystem@gmail.com</a> Website: <a href="http://www.tn.gov.in">www.tn.gov.in</a></td>
</tr>
</tbody>
</table>
## Committee for Selection of Award Winning Entries

<table>
<thead>
<tr>
<th>Name</th>
<th>Field of Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prof. Chetan Vaidya,</strong></td>
<td>Architect &amp; Town Planner</td>
</tr>
<tr>
<td>Director, School of Planning and Architecture, New Delhi, Director HUDCO</td>
<td></td>
</tr>
<tr>
<td><strong>Mr. R.K. Safaya</strong></td>
<td>Architect &amp; Urban Designer</td>
</tr>
<tr>
<td>Executive Director (r), HUDCO</td>
<td></td>
</tr>
<tr>
<td><strong>Dr. N.B. Mazumdar,</strong></td>
<td>Solid Waste Management Expert</td>
</tr>
<tr>
<td>Former Chief Projects (Waste Management), HUDCO &amp; Chairman of Expert Committee on MSWM, MoUD, GOI</td>
<td></td>
</tr>
<tr>
<td><strong>Dr. Amod Kumar</strong></td>
<td>Medical Practitioner</td>
</tr>
<tr>
<td>Consultant &amp; Head of Department of Community Health, St. Stephen's Hospital, Delhi</td>
<td></td>
</tr>
<tr>
<td><strong>Mr. V.K. Dhar,</strong></td>
<td>Engineer &amp; Town Planner</td>
</tr>
<tr>
<td>Former-Faculty, NIUA, Delhi</td>
<td></td>
</tr>
</tbody>
</table>

## Managing Editors and Editorial Team Members

### Managing Editors

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dr. M Ravi Kanth, IAS (r)</strong></td>
<td>Chairman and Managing Director, HUDCO</td>
</tr>
<tr>
<td><strong>Dr. D. Subrahmanyam</strong></td>
<td>Sr. Executive Director (Training) HSMI, HUDCO</td>
</tr>
</tbody>
</table>

### Editorial Team HUDCO’S HSMI

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Details</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mr. Surendra Kumar</strong></td>
<td>Fellow/ Jt. General Manager (Projects)</td>
<td></td>
</tr>
<tr>
<td><strong>Ms. Simrandeep Kaur</strong></td>
<td>Fellow/ Jt. General Manager (Projects)</td>
<td></td>
</tr>
<tr>
<td><strong>Ms. Nila Pandian</strong></td>
<td>Dy. General Manager (Projects)</td>
<td></td>
</tr>
<tr>
<td><strong>Ms. Sangeeta Maunav</strong></td>
<td>Associate Fellow</td>
<td></td>
</tr>
<tr>
<td><strong>Mr. Swapnil Vidhate</strong></td>
<td>Trainee Officer (Projects).</td>
<td></td>
</tr>
</tbody>
</table>
A central model agency along with NHB under PMAY Credit Linked Subsidy Scheme (CLSS) of Housing for All

Housing & Urban Development Corporation Ltd.

Hudco is a wholly owned Government Company engaged in providing loans for housing and urban infrastructure projects in India. It is also creating a pool of skilled and professional people habitats for transforming lives of people committed to promoting sustainable

Pradhan Mantri Awas Yojana (PMAY)

Institution promoting sustainable habitat development committed to be a leading techno-financial
HUDCO NIWAS
Individual Housing Loan Scheme
A home at hand, a smile on the face.

- HOUSING
- INFRASTRUCTURE
- CONSULTANCY SERVICES
- RESEARCH AND TRAINING
- BUILDING TECHNOLOGY

hudco
Promoting sustainable habitat & infrastructure development to enhance quality of life.

As India’s premier techno-financial institution and a Mini - Ratna I Company with the mandate of ‘Profitability with Social Justice’, HUDCO is leading the way in pioneering sustainable habitats for the EWS, enabling holistic urban development, facilitating inclusive economic growth & realizing an ambitious target of one million houses per annum.

HOUSING AND URBAN DEVELOPMENT CORPORATION LTD.
(A Govt. of India Enterprise) CIN: L74899DL1970GOI005276
HUDCO Bhawan, Core-T-A, India Habitat Centre, Lodhi Road, New Delhi - 110 003.
Tel: 011-24649610-23, 24827113-15 Fax: 011-24625308 E-Mail: mail@hudco.org
Visit us at: www.hudco.org
You Create. We Honour.

If you have designed anything exceptional in the housing sector or landscape planning, then enter your designs and innovations in the 6th HUDCO Design Awards 2017. And let the world know your creativity and design excellence.

The categories are:

1. Cost Effective Rural / Urban Housing including Innovative / Emerging & Disaster Resistant Technology
2. New & Innovative Town Design Solutions / Eco Cities
3. Conservation of Heritage
4. Green Buildings
5. Landscape Planning & Design

Last Date for receipt of entries: 30th November 2017

For details visit: www.hudco.org
Send your queries at: designawards@hudco.org or
Call us at: 011-24648425

Housing & Urban Development Corporation Ltd.
(A Govt. of India Enterprise) CIN: L74899DL1970GOI0005276
HUDCO Bhawan, Core 7-A, India Habitat Centre, Lodhi Road, New Delhi-110 003
HUDCO's HSMI Publication

Human Settlement Management Institute
Research and Training Wing,
HUDCO House, Lodhi Road, New Delhi – 110 003
Telephone 011-24369534, 011-24308600/606
Fax 011-24365292, 24366426
Email: edthsmi2013@gmail.com, cpdhsmi@gmail.com

Housing and Urban Development Corporation Limited
Corporate Office: Core 7-A, HUDCO Bhawan,
India Habitat Centre, Lodhi Road New Delhi – 110 003
Telephone (EPABX) 011-24649610-23, 24627113-13
After Office Hours: 011-24648193-95
Fax No. 011-24625308
E mail: hudco@hudco.org,
Website: www.hudco.org
CIN: L74899DL1970G0I1005276