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CEEW Policy Brief

Swachh Bharat

Kachra Mukh,
Shouchalaya Yukt Bharat

RUDRESH KUMAR SUGAM, SONALI MITTRA,
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A Policy Brief on ‘Swachh Bharat: Kachra Mukh, Shouchalaya Yukt Bharat’.

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ABOUT CEEW

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- 1st in India for 'Best Policy Study/Report' for its study on India's National Water Resources Framework (2013)

In four years of operations, CEEW has engaged in more than 70 research projects, published more than 40 peer-reviewed policy reports and papers, advised governments around the world over 80 times, engaged with industry to encourage investments in clean technologies and improve efficiency in resource use, promoted bilateral and multilateral initiatives between governments on more than 30 occasions, helped state governments with water and irrigation reforms, and organised more than 80 seminars and conferences.

CEEW's major completed projects : 584-page National Water Resources Framework Study for India's 12th Five Year Plan; India's first report on global governance, submitted to the National Security Adviser; foreign policy implications for resource security; India's power sector reforms; first independent assessment of India's solar mission; India's green industrial policy; resource nexus, and strategic industries and technologies for India's National Security Advisory Board; \$125 million India-U.S. Joint Clean Energy R&D Centers; business case for phasing down HFCs; geoengineering governance (with UK's Royal Society and the IPCC); decentralised energy in India; energy storage technologies; Maharashtra-Guangdong partnership on sustainability; clean energy subsidies (for the Rio+20 Summit); reports on climate finance; financial instruments for energy access for the World Bank; irrigation reform for Bihar; multi-stakeholder initiative for urban water management; Swachh Bharat; environmental clearances; nuclear power and low-carbon pathways; and electric rail transport.

CEEW's **current projects include**: the Clean Energy Access Network (CLEAN) of hundreds of decentralised clean energy firms; the Indian Alliance on Health and Pollution; low-carbon rural development; modelling long-term energy scenarios; modelling energy-

water nexus; coal power technology upgradation; India's 2030 renewable energy roadmap; energy access surveys; energy subsidies reform; supporting India's National Water Mission; collective action for water security; business case for energy efficiency and emissions reductions; assessing climate risk; modelling HFC emissions; advising in the run up to climate negotiations (COP-21) in Paris.

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Rudresh Kumar Sugam is a Junior Research Associate at the Council of Energy, Environment and Water (CEEW), India. He has around five years of working experience in the water sector. He has done several projects involving extensive primary and secondary research. Recently, he completed a project focussing on drivers of Collective Action for Water Security and Sustainability. He has done a project on urban water management in India, which involved a series of multi-stakeholder round table discussions for identifying challenges and opportunities in the urban water sector in India. He also conducted an evidence-based research for the Minor Water Resources Department, Government of Bihar exploring institutional reforms that are required in minor irrigation to achieve agricultural growth targets set by the State. He has worked as Project Executive in Asian Consulting Engineers Pvt. Ltd., Delhi, where he has executed several projects of "Source Vulnerability Assessment and Source Water Protection Plan" for the coca cola bottling plants located in different states of India. His interest areas include food-water-energy nexus, land use planning, impact of climate change on water resources, integrated watershed management, and sustainable development.

His educational qualifications include a Post Graduate degree in Water Resources Management (gold medalist) from The Energy and Resources Institute (TERI) University, Delhi and a B.Sc. in Botany from Kirori Mal College, University of Delhi. His post-graduate dissertation was on estimating storm water pond nitrogen and phosphate removal efficiency with the Yale School of Forestry and Environment Studies, Yale University, United States. He has done trainings on Hydrological Modelling and SWAT modelling in National Water Academy, Pune and IIT-Delhi, respectively. He has done a Post Graduate Diploma in Urban Environmental Management & Law from WWF and NLU, Delhi. Recently, he participated in an Indo-Bangladesh IUCN sponsored two weeks programme Water Futures II: A Dialogue for Young Scholars and Professionals to understand and debate on trans-boundary water management concern.

Sonali Mitra

Sonali Mitra was a Junior Research Associate at the Council on Energy, Environment and Water (CEEW), India. Her work in the past few years has been dedicated to the nexus between energy-water security, specifically transboundary water management and diplomacy, hydropower, and environmental security. Before joining CEEW, Sonali was working with Chatham House, London as the project consultant and India-lead for Sino-Indian Water Collaboration project. Her recent research interests include: National water governance strategies, participatory approaches to water management, political sociology of water, water conflicts, water diplomacy and South Asian water tower.

Previously she worked as a junior fellow at the Center for Resources Management, Observer Research Foundation, Delhi. She has been the principal manager for ORF's flagship water initiatives. Sonali has coordinated and participated in more than 5 major Track II Dialogues and conferences between India, Nepal, Bangladesh, China, Mekong countries and Pakistan on water- energy nexus. Her recent project: Attitudes Around Water delved into perceptual analysis of policy makers, academicians, media, lawyers and the hydrocracy with respect to myths and misconceptions regarding water management in India.

She co-edited a book: Perspectives on Water - Constructing alternative narratives in 2012 published by the academic foundation, delineating different case studies from South Asia to assess present socio-economic realities that surround water management. She has been a regular editorial contributor to the Energy News Monitor (Observer Research Foundation) on topics of hydropower and renewable energy. She has authored policy recommendation reports and academic papers on Ganga and Indus basin.

Sonali has done her graduation in Botany Hons from Sri Venkateswara College, Delhi University. She completed her masters in Environmental Impact Assessment and Management from University of Manchester, United Kingdom. Sonali holds a post graduate diploma in Environmental Law and management from Indian Law Institute, New Delhi, India. She has worked as editor trainee for IPR drafting and interned with Mont Riont Foundation, Alzheimer's Research Institute, Switzerland.

Dr Arunabha Ghosh

Arunabha Ghosh is CEO of the Council on Energy, Environment and Water (CEEW), an independent, policy research institution in India. Arunabha conceptualised and has led CEEW, since its founding in August 2010, to the top-ranked climate think-tank in India for the last two years in a row. CEEW has been ranked best in India (and South Asia) in several categories two years running in the Global Go To Think Tank Index. With experience in 35 countries and having worked at Princeton, Oxford, UNDP and WTO, Arunabha advises governments, industry and civil society around the world on: energy and resources security; renewable energy; water governance; climate governance; energy-trade-climate linkages; and international regime design. He is a World Economic Forum Young Global Leader, Asia Society Asia 21 Young Leader, and fellow of the Aspen Global Leadership Network. He is also a founding board member of the the Clean Energy Access Network (CLEAN). He writes a monthly column, Inflexion Points, in the Business Standard.

Dr Ghosh is member of Track II dialogues with the United States (co-chair of the taskforce on economic relations for the Aspen Strategy Dialogue), Bhutan, Israel, Pakistan and Singapore. He formulated the Maharashtra-Guangdong Partnership on Sustainability. Dr Ghosh is associated with Oxford's Global Economic Governance Programme and Oxford's Smith School of Enterprise & the Environment. He was Global Leaders Fellow at Princeton's

Woodrow Wilson School and at Oxford's Department of Politics and International Relations. He was Policy Specialist at the United Nations Development Programme (New York) and worked at the World Trade Organization (Geneva). He is on the Board of the International Centre for Trade & Sustainable Development.

Arunabha's publications include: Materials, Markets, Multilateralism; Three Mantras for India's Resource Security; Understanding Complexity, Anticipating Change (India's first report on global governance, submitted to the National Security Adviser); National Water Resources Framework Study (for India's 12th Five Year Plan); Strategic Industries and Emerging Technologies (for the National Security Advisory Board); Laying the Foundation of a Bright Future (first evaluation of India's solar mission); Making the UN Secretary General's Climate Summit Count; India's Resource Nexus (also for NSAB); Governing Clean Energy Subsidies; RE+: Renewables Beyond Electricity; Urban Water and Sanitation in India; Institutional Reforms for Improved Service Delivery in Bihar (on irrigation); Harnessing the Power Shift (on climate finance); International Cooperation and the Governance of Geoengineering (for the IPCC); Collective Action for Water Security and Sustainability; and three UNDP Human Development Reports. He has also led research on trade, intellectual property, financial crises, development assistance, indigenous people, extremism and conflict.

Dr Ghosh has presented to heads of state, India's Parliament, the European Parliament, Brazil's Senate, and other legislatures; trained ministers in Central Asia; and hosted a documentary on water set out of Africa. His op-eds have appeared in the Times of India, The Hindu, India Today, Indian Express, Financial Express, Mint, Seminar, and Tehelka. He has delivered public lectures in several countries, and commented on All India Radio, ABC (Australia), BBC, CNN-IBN, NDTV (India) and Voice of America, among other broadcasters.

Arunabha has been consulted by the Asian Development Bank, Commonwealth Secretariat (London), DFID (UK), IDRC (Canada), International Energy Agency, International Finance Corporation, IPCC, Oxfam International, Transparency International, UK Ministry of Justice, USAID, and the World Bank. He co-chaired the international governance working group for the UK Royal Society's Solar Radiation Management Governance Initiative. He has been an Editor of the Journal of Human Development and Capabilities.

Arunabha holds a doctorate and M.Phil. in international relations from Oxford (Clarendon Scholar and Marvin Bower Scholar); an M.A. (First Class) in Philosophy, Politics and Economics (Balliol College, Oxford; Radhakrishnan Scholar); and topped Economics from St. Stephen's College, Delhi University.



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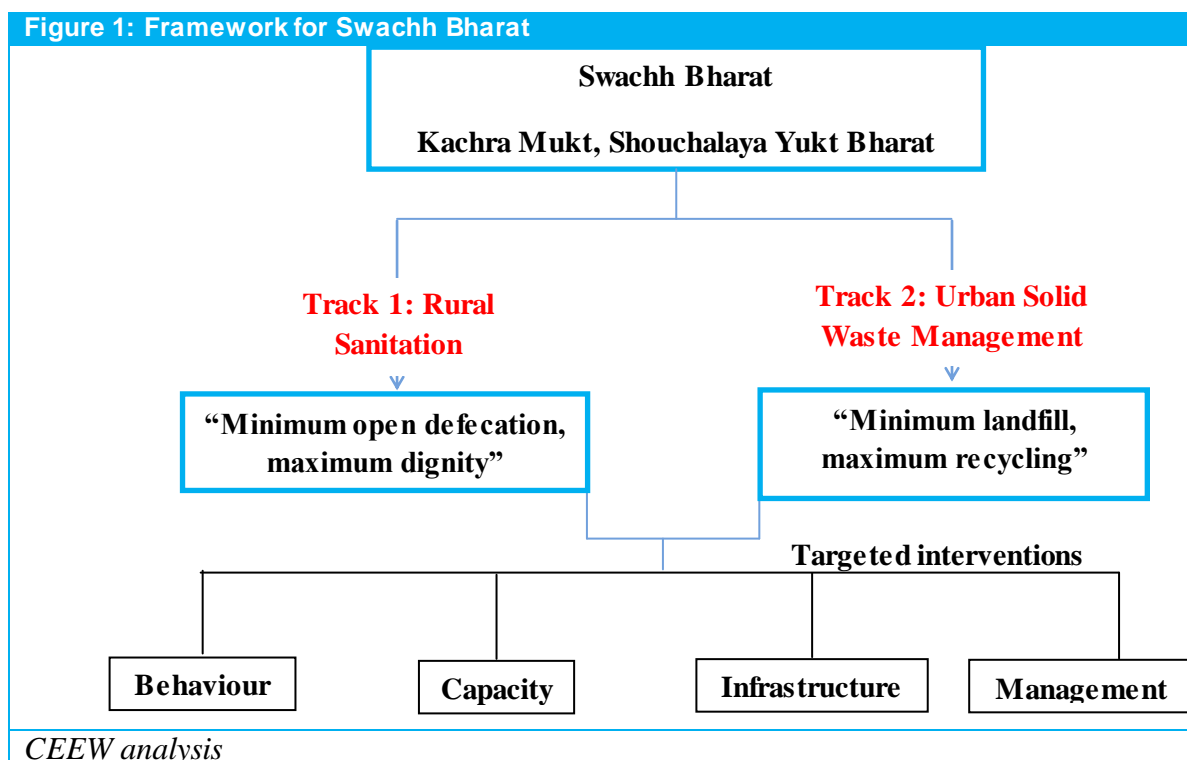
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1. INTRODUCTION

On 15 August 2014, the Honourable Prime Minister of India, Shri Narendra Modi, announced the intention to launch a new mission, Swachh Bharat, on 2 October 2014, Mahatma Gandhi's birth anniversary. Intended to last until 2 October 2019, when India will celebrate Gandhiji's 150th birth anniversary, Swachh Bharat is a targeted mission to build a clean, hygienic and healthy India with adequate sanitation facilities and, more importantly, dignity for all Indians. This policy paper is a contribution from the Council on Energy, Environment and Water towards developing the vision and action plan for this ambitious but much needed mission. This paper envisions Swachh Bharat as "*Kachhra Mukta, Shouchalaya Yukt Bharat*". Drawing on extensive literature and our own analysis, the paper outlines specific interventions, estimates the associated costs, and offers a detailed phase-wise roadmap to fulfil the Mission.

In order to focus attention on the most important and neglected sectors, and to ensure that the Swachh Bharat Mission has clear, measurable outcomes, we have identified two key tracks: **Rural Sanitation** and **Urban Solid Waste Management**. The specific interventions required for these two tracks are outlined below and fall under four broad categories: *Behaviour*, *Capacity*, *Infrastructure*, and *Management*. **Figure 1** below represents a framework for the Swachh Bharat Mission.



The identified interventions were then segregated into:

- *What* – actual detailing of intervention
- *Who* – agencies who could potentially contribute for this intervention
- *Where* – level at which intervention is desired
- *How* – detailing of the process of intervention
- *When* – the phase (detailed below) in which the intervention is desired to be undertaken
- *Cost* – estimated cost for a particular intervention at a certain level. Estimations were based on available literature, consultations with experts and assumptions outlined in Annexures I & II.

Phases of intervention – The interventions has been divided into 3 phases and a realistic target of Swachh Bharat by 2024 is envisioned. In this manner it also envisions a continuation of the Mission beyond the immediate five years.

- **Phase I - Oct. 2014 – Oct.2016**
- **Phase II - Nov. 2016 – Oct. 2019**
- **Phase III - Nov. 2019 – Mar. 2024**

2. RURAL SANITATION¹

Several reports have highlighted that the practice of open defecation in rural India is highest in the world, which is a matter of great shame and also of immediate concern from health point of view. It is still a debate amongst researchers whether it is a **supply side or demand side issue**. Therefore it is essential to work towards analysing the status of toilets and mapping people's behaviour for understanding the indigenous problems and not generalise it country-wide. In this document the interventions have been grouped under sub-headings so that the document does not become too text heavy and inconvenient for the readers to understand.

2.1 Behaviour

a. Understanding Behaviour

What: Conducting survey for understanding rural sanitation challenges, requirements and behaviour

Who: Survey by agencies such as the Census department, National Sample Survey Organisation (NSSO), National Rural Health Mission (NRHM), Department of Water Supply and Sanitation (DWSS), Sarva Siksha Abhiyan (SSA).

Where: At Gram Panchayat (GP) level

How: Nirmal Bharat Abhiyan (NBA)/DWSS workers at GP level could conduct household survey with guidance from block /district level sanitation committees

When: **Phase I**

Cost: No additional cost is envisaged

Cost per capita: **INR 0**

b. Changing Behaviour

What: Mapping the village defecation area, toilets, water and food sources. Sanitation awareness campaigns, audio-visuals, public gatherings, etc.

¹ Sanitation literally means measures necessary for improving and protecting health and well-being of the people. Sanitation is any system that promotes proper disposal of human and animal wastes, proper use of toilet and avoiding open space defecation (UN). Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and faeces (WHO). Thus the basic concept of sanitation is to manage human excreta in such a way that it does not contaminate water or food, which would help in achieving cleanliness and a dignified life.

Who: NBA/DWSS workers could work in association with local NGOs, public personalities, local and national media.

Where: At Gram Panchayat level/district level

How: Local NGOs could be contracted by the district sanitation committee for this purpose. Behaviour could be changed by undertaking focussed group discussions, showing audio-visuals, community meetings etc., for associating **Shame** and **Disgust** with open defecation and **Pride** with having clean toilets. Also, organising improved sanitation campaigns, advertisements regarding sanitation campaigns through print and digital media, posters etc. and involving public personalities, local leaders etc., for propagating the message of improved sanitation benefits would be useful. Mechanisms such as awarding/recognising households with toilets as Nirmal households or propagating ideas such as “no toilet no marriage” could be adopted.

When: **Phase I**

Cost: **INR 45500 per GP**

Cost per capita: **INR 13.02**

2.2 Capacity building

a. Individual Level

What: Providing training to local masons, local vendors and local people and operator of community toilet.

Who: World Toilet Organisation, Sulabh International, Gramalaya etc. could be contracted for providing training to these people.

Where: At Block level

How: The training could be provided to local masons in a group of 20-30 for showing them ways to use local materials for the construction of toilets and also demonstrating techniques to design proper toilets. Training/awareness campaigns could be conducted for motivating existing local sanitary material vendors by educating interested local entrepreneurs about the marketing of sanitation utilities. New vendors could also emerge as a result. Also, cleaning and maintaining toilet hygiene

is important and this could be done by training operators of community toilets and sample households.

When: Phase I

Cost: **INR 6877 per GP**

Cost per capita: **INR 2**

b. Institutional Level

What: Training of district level expert team and Community-Led-Total-Sanitation (CLTS) facilitators

Who: Administrative Staff College of India (ASCI), UNICEF

Where: At District level

How: NBA has already created a district level sanitation team which comprises of experts from different sectors and they could act as trainers for block level CLTS facilitators. ASCI, in association with UNICEF, has designed a course especially for district level sanitation executives. It also regularly offers training programmes for mid-level and senior level people working in the water and sanitation sector. Thus, the expert team could be sent to these training programmes for learning new technologies, developing management skills etc.

When: Phase I

Cost: **INR 403 per GP**

Cost per capita: **INR 0.12**

2.3 Infrastructure

In an ideal situation there should be construction of complete sewage system but considering current situation, where hundreds of towns do not have a sewerage system, and those which have are not able to treat the sewage, construction of an environmentally friendly toilet with two pits is suggested.

Figure 2 shows the desired characteristics of such a toilet which would be used on a long-term basis. Otherwise there is a high risk of the toilets being left unused after a brief period.

a. School Level and Community Level Toilet

What: Construction of one separate toilet for girls in every school and one community toilet complex per village for landless and poor people.

Who: Local mason under the guidance of Sulabh International, Gramalaya etc.

Where: At Village/GP level

How: Every school should be mandated to build a separate toilet for girls. Also, by utilising public spaces construction of at least one community toilet complex per village is suggested. It should be provided with a dedicated operator preferably selected from one of the community toilet using households. Funds for constructing toilets at school and community level are already covered under SSA & NBA, respectively.

When: Phase I

Cost: **INR 73524 per GP**

Cost per capita: **INR 21**

b. Individual Household Level Toilet

Who: Local masons, service providers, Sulabh International, Gramalaya etc.

Where: At Household level

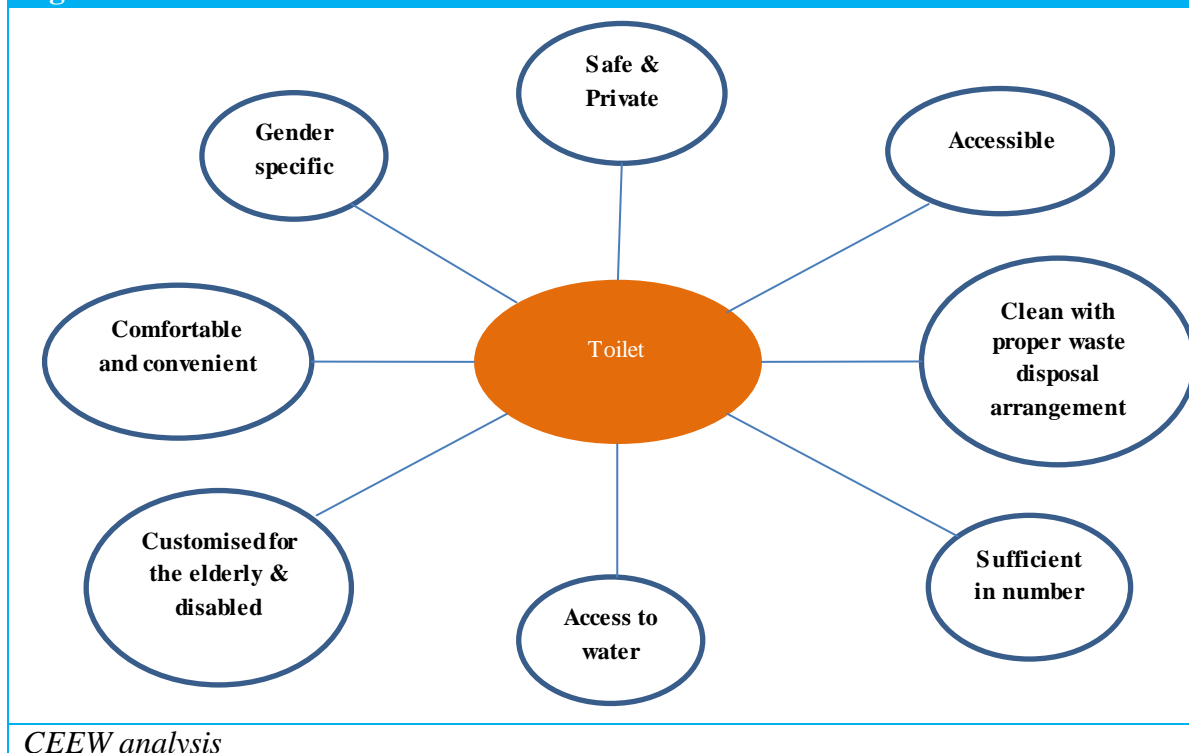
How: Every household should be motivated to build its own toilet properly customised to fit to the local situation (incentives already coming from NBA). Several designs are available in the market and if necessary Sulabh, Gramalaya etc., could be consulted to customise the toilet design as per the requirement and availability of materials.

When: Phase I & II

Cost: **INR 7871810 per GP** (average INR 11000 per HH)

Cost per capita: **INR 2252.8**

Figure 2: Desired characteristics of a toilet



2.4 Management

Overall efficient management of sanitation programmes from framing state level policies to maintenance of individual household level toilets is essential for the success of this mission. There are several government agencies working in different sectors, which are related and should work collectively, such water supply, health, sanitation etc. Thus, management of these sectors should be done by interlinking programmes and developing integrated plans.

Also, the follow up campaigns are as important as constructing toilets and conducting initial awareness campaigns because there are several cases where people have moved back to open defecation.

a. Operation and Maintenance

What: Regular cleaning of individual and community toilets for maintaining hygiene status.
Mechanised emptying of pits

Who: Private contractors for mechanised emptying of pits, one operator per village for care of community toilets.

Where: At HH/village level

How: Tenders could be invited for the mechanised cleaning of pits and interested local entrepreneurs could be contracted for the service on a biannual basis. The rate of cleaning/pit emptying would be fixed by the district sanitation committee but the cost of cleaning would have to be paid by individual households. Hiring one paid community toilet caretaker.

When: Phase I & II

Cost: **INR 13381 per GP** (Monthly recurring) + cost of cleaning equipment (suction pumps, tanks etc.) to be borne by the contractors which would get covered on longer term by the cleaning charges.

Cost per capita: **INR 4**

b. Monitoring and Evaluation

What: Quality check of toilets, quarterly toilet use report, public feedback regarding O&M of community toilets, inventory of households needing assistance, supporting penalty mechanisms

Who: GP sanitation teams, youth, students, elderly people etc.

Where: At HH/Village/GP level

How: The existing sanitation team can prepare a report of the type of toilets built at individual household and community level but an initial training is required to be provided to the sanitation team. It is also necessary to keep a check on the use of toilets by villagers. Again, GP sanitation team can send data to the district about households still defecating in the open. For information regarding maintenance of community toilets, one person from each household using community toilets could either send a free SMS or report it to the GP if the toilet is not being maintained properly. GP sanitation team could report to the district committee about the challenges that people are facing with their toilets, seeking appropriate assistance from the expert team. School students, youths and GP sanitation team maintain vigilance on people practising open defecation. They could blow the whistle and the GP could penalise (monetary fines or social shame) them to stop the practice of open defecation.

When: Phase II & III

Cost: INR 20000 per GP

Cost per capita: INR 6

c. Linking Programmes

What: Linking programmes such as NBA, SSA, MNREGA, DWSS, NRHM etc., which are working in isolation but for a similar purpose. Although some work has been done to link MNREGA and NBA, a more holistic approach is required.

Who: State department/ministries such as rural development, DWSS, education, MNREGA, NBA, S&WCD, PHED etc.

Where: At district/state level

How: Related state departments should do monthly/quarterly meetings in order to understand the complexity/challenges comprehensively and develop integrated plans.

When: Phase I, II & III

Cost: No additional cost envisaged

d. Follow Up Campaigns

What: Follow up sanitation campaigns to sustain changed behaviour.

Who: WSP, WHO, UNICEF, school children, anganwadi workers, sanitation teams, youth etc. could do the campaigns at different level to keep people motivated for using hygienic practices. NRHM should include questions to analyse change in behaviour of people about sanitation.

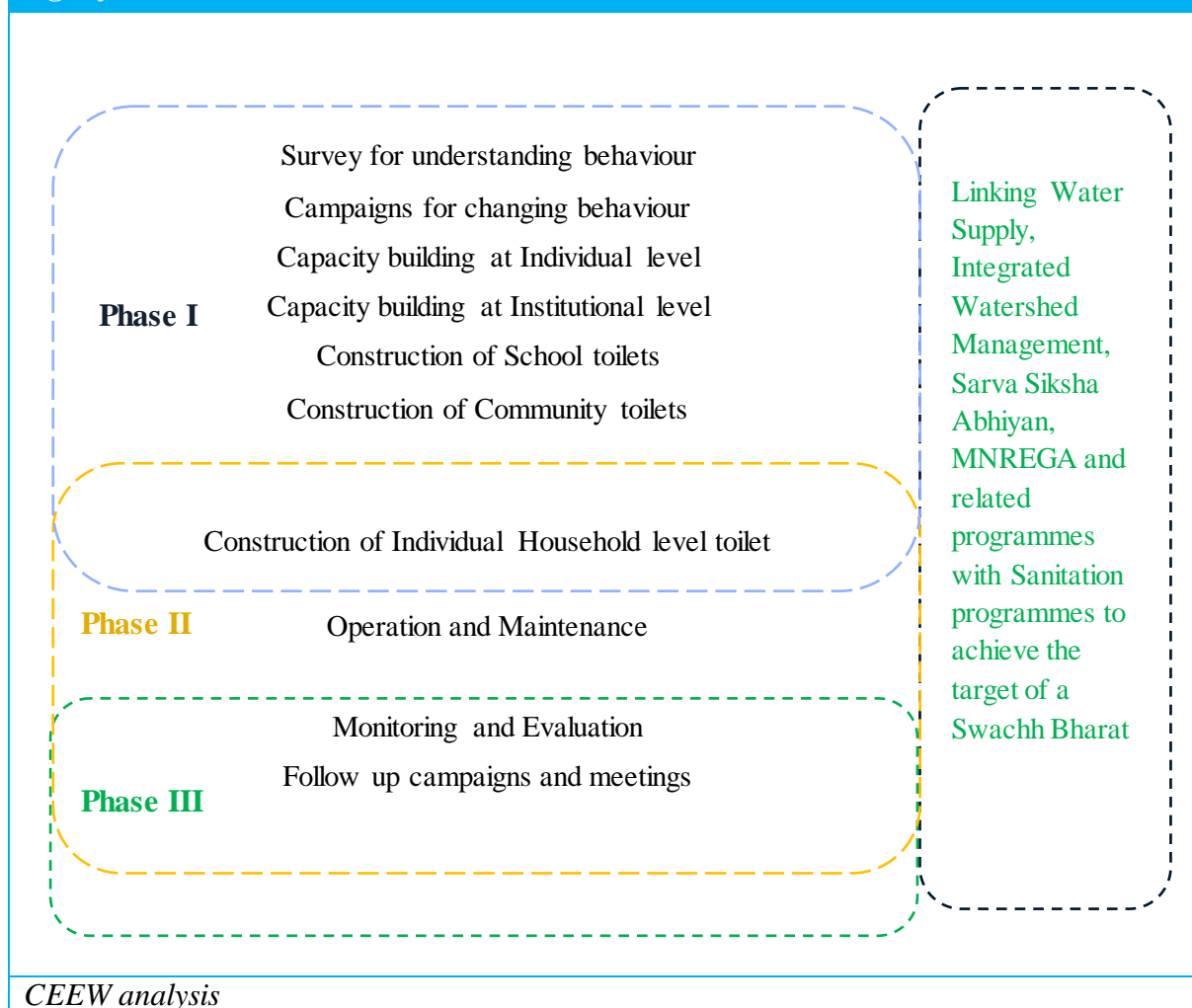
Where: At HH/Village/GP level

How: Reporting by the GP sanitation team on type and use of toilets and HH concerns. Whistle blowing by students, youths, elderly people etc., against open defecation

When: Phase II & III

Cost: No additional cost envisaged

Figure 3: Overall roadmap for achieving “minimum open defecation, maximum dignity”



3. URBAN SOLID WASTE MANAGEMENT

Growth in urbanisation, especially in the last few decades has resulted in a rapid increase in domestic solid waste². The per capita waste generation rate in India has increased from 0.44 kg/day in 2001 to 0.5 kg/day in 2011, fuelled by changing lifestyles and increased purchasing power of urban Indians. Lack of financial resources, institutional weaknesses, improper choice of technology and public apathy towards waste has made the prevalent system of waste management far from satisfactory. For instance, the practice of uncontrolled dumping of waste on the outskirts of towns and cities has created serious environmental and public health problems, which threaten water quality and urbanisation itself.

In an attempt to address this glaring challenge, the following actions have been designed under the four main pillars of interventions: behaviour, capacity building, infrastructure and management.

3.1 Behaviour

a. Understanding Behaviour

What: Social perception mapping to understand cleanliness behaviours in Class 1 Urban Agglomerations (UAs)/Towns³.

Who: NSSO, Census department (MoHA), private bodies (BRIEF India), Ministry of Urban Development.

Where: At Urban Agglomeration /Town level

How: Social perception mapping survey of the representative sample of 264 million population of class 1 Urban Agglomerations/towns to be undertaken by trained teams. 11320 households to be surveyed by the team for each Urban Agglomeration (calculated on 10% of the representative sample).

When: Phase I

Cost: **INR 1.13 lakhs** per Class 1 Urban Agglomeration /Town

Cost per capita: **INR 2**

² Solid waste including commercial and residential wastes generated in a municipal or notified area in either solid or semi-solid form excluding industrial hazardous wastes but including treated bio-medical wastes.

³ The Urban Agglomerations/Town are grouped on the basis their population in Census. The UAs/Town which have at least 100000 persons as population are categorised as Class I UA/Town. As per Census 2011, there are 468 such UAs/Town.

b. Changing Behaviour

What: Conducting local education campaigns for five alternate years (over a period of ten years) on cleanliness discipline.

Who: 20 member teams comprising of trained representatives from ULBs, schools, residential complexes, associations, companies and organisations from every Urban Agglomeration/Town.

Where: At Urban Agglomeration /Town level

How: Each team to formulate a discipline education strategy based on the perception survey results for their UA/town (contextualised and focused) and conduct training campaigns spreading over 12 weeks for each Urban Agglomeration. Teams should use visual representations, focus group discussions, competitions and plays to communicate best practices in cleanliness behaviours. Creating a sense of ownership and responsibility of citizens towards keeping their areas and neighbourhood clean should be focused upon.

When: Phase I, II and III

Cost: **INR 19.49 lakhs** per Class 1 Urban Agglomeration /Town

Cost per capita: **INR 3.45**

c. Sustaining Improved Behaviour

What: Conducting annual zonal hygiene/cleanliness competition

Who: ULBs in coordination with other local authorities, schools, NGOs and Resident Welfare Associations (RWAs).

Where: At Urban Agglomeration /Town level

How: Competition between the 4 zones on neighbourhood cleanliness and hygiene to be organised by ULBs or contracted NGOs every year to promote discipline and incentivise innovation in cleanliness. Criteria for decision should be contextualised to include neighbourhood cleanliness, best practices, zero littering, minimising waste, segregation at the source and awarding outstanding community leaders.

When: Phase I, II and III

Cost: **INR 10 lakhs** per Class 1 Urban Agglomeration /Town

Cost per capita: **INR 1.77**

d. Sustaining Improved Behaviours

What: Employing 'public shame' strategy for compliance

Who: Local media (newspapers, local channels, radio, print media, pamphlets etc.) in collaboration with ULBs/RWAs

Where: At Urban Agglomeration /Town level

How: Creating mechanism for reporting any non-compliant behaviour to the designated authority (ULBs). Publicising the compliant and non-compliant citizens (selected by the ULBs based on the complaints), on a monthly basis, using print, digital and social media platforms.

When: Phase I, II and III

Cost: **INR 2.4 lakhs** per Class 1 Urban Agglomeration /Town

Cost per capita: **INR 0.45**

3.2 Capacity Building

a. Information and Knowledge Capacity

What: Creating a public information cell on waste management for each zone within the ULBs.

Who: ULBs, State government (Urban development)

Where: At municipality level

How: Creating e-information portals and employing officers for the information cell within the existing ULBs. These officers should facilitate information on backward and forward linkages for waste collection, transport, processing and disposal; provide information on opportunities for local recycling and decentralised composting; provide information on key contacts and process for collaborations with ULBs for waste management.

When: **Phase I, II and III**

Cost: **INR 15 lakhs** per Class 1 Urban Agglomeration /Town

Cost per capita: **INR 2.65**

b. Technical Capacity

What: Creating at least 1 vocational and technical training centre per Urban Agglomeration /Town for waste management course

Who: National Solid Waste Association of India, special vocational training centres, NGOs like Chintan, Vatavaran etc.

Where: At Urban Agglomeration /Town level

How: ULBs to conduct a survey on manpower requirements in the Urban Agglomeration /Town for waste management and communicate the number to the vocational training centre in its Urban Agglomeration. The vocational and technical training course to be remodelled for solid waste management to meet the requirements. Public buildings (schools, offices etc) to be utilised for organising training classes at appropriate times.

When: **Phase I and II**

Cost: **INR 203.6 lakhs** per Class 1 Urban Agglomeration /Town

Cost per capita: **INR 36**

3.3 Infrastructure

a. Primary Collection

What: One community dustbin (classified waste collection) at every 50 m of the Urban Agglomeration /Town.

Who: ULBs, State government (Department of Urban Development)

Where: At municipality level

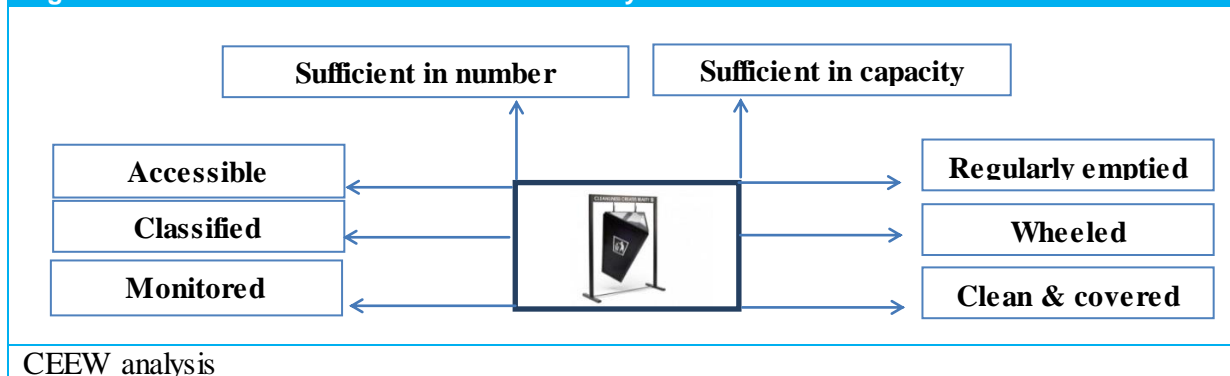
How: ULBs to map the areas and positions for community dustbins (high quality) with minimum 500 litres capacity; order and place the required number of dustbins and ensure regular cleaning and emptying of the dustbins. A monitoring sheet with schedule of cleaning to be attached to each of the dustbins for the citizens to comply and be aware of the cleaning routines.

When: **Phase I and II**

Cost: INR 76.92 lakhs per Class 1 Urban Agglomeration /Town

Cost per capita: INR 13.6

Figure 4: Desired characteristics of a community bin



b. Segregation

What: Providing at least 1 Waste Sorting & Transfer Facility for each zone in a Urban Agglomeration /Town.

Who: Urban Local bodies/private contractors

Where: At Urban Agglomeration /Town level

How: ULB's to provide space and assistance for building Sorting and Transfer Facility for rag pickers and others to sort and sell the recyclable waste before transferring to the waste processing unit. Private contractors may be approached to handle administrative and management functions. Incentivise the rag pickers with additional support (100 per zone at Rs 2/Kg of the waste collected, sorted and sold).

When: **Phase II**

Cost: INR 219.87 lakhs per Class 1 Urban Agglomeration /Town

Cost per capita: INR 38.8

c. Processing

What: Constructing at least 1 multi-processing unit for each Class 1 Urban Agglomeration /Town

Who: Urban Local bodies, State government (Department of urban development), private contractors

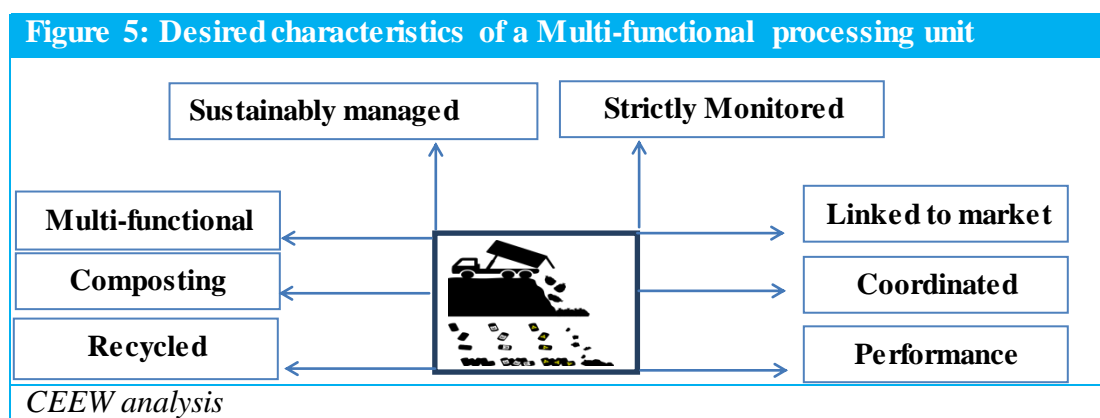
Where: At Urban Agglomeration /Town level

How: ULB's to assess and plan for building a multi-functional processing unit for composting and recycling of waste with appropriate technologies (including remodelling the existing waste disposal sites). Private contracts on BOT basis could be used. Backward and forward linkages to be facilitated by ULBs.

When: **Phase II and III**

Cost: **INR 779.9 lakhs** per Class 1 Urban Agglomeration /Town

Cost per capita: **INR 137.8**



3.4 Management

a. Integrated Management

What: Integrating waste management process for Class 1 Urban Agglomerations/Towns

Who: ULBs, State government (Department of urban development), private contractors

Where: At UA/Town level

How: ULBs to facilitate single window clearance for PPP based models for waste treatment projects. Provide assistance for technical and financial support; provide risk guarantee mechanisms for private contractors to manage the entire process of waste management (collection to disposal).

When: **Phase I, II and III**

Cost: **INR 14.78 lakhs** per Class 1 Urban Agglomeration /Town

Cost per capita: **INR 261.15**

b. Develop Performance Index

What: Developing performance index for waste processing processes.

Who: WTERT, NEERI, NSWAI or other research institutes in consultation with existing waste processing units

Where: At National level

How: Appointing a research organisation to conduct research on developing a performance index for processing and disposal plants in order to establish monitoring mechanisms for waste management.

When: **Phase I**

Cost: **INR 25 lakhs** (process based study – national level)

Cost per capita: **INR 0.09**

c. Monitoring

What: Appointing Local Cleanliness Monitors for each zone in the Class 1 Urban Agglomeration/Town.

Who: Resident's Welfare Association (RWA)/representative bodies in collaboration with ULBs

Where: At zonal level

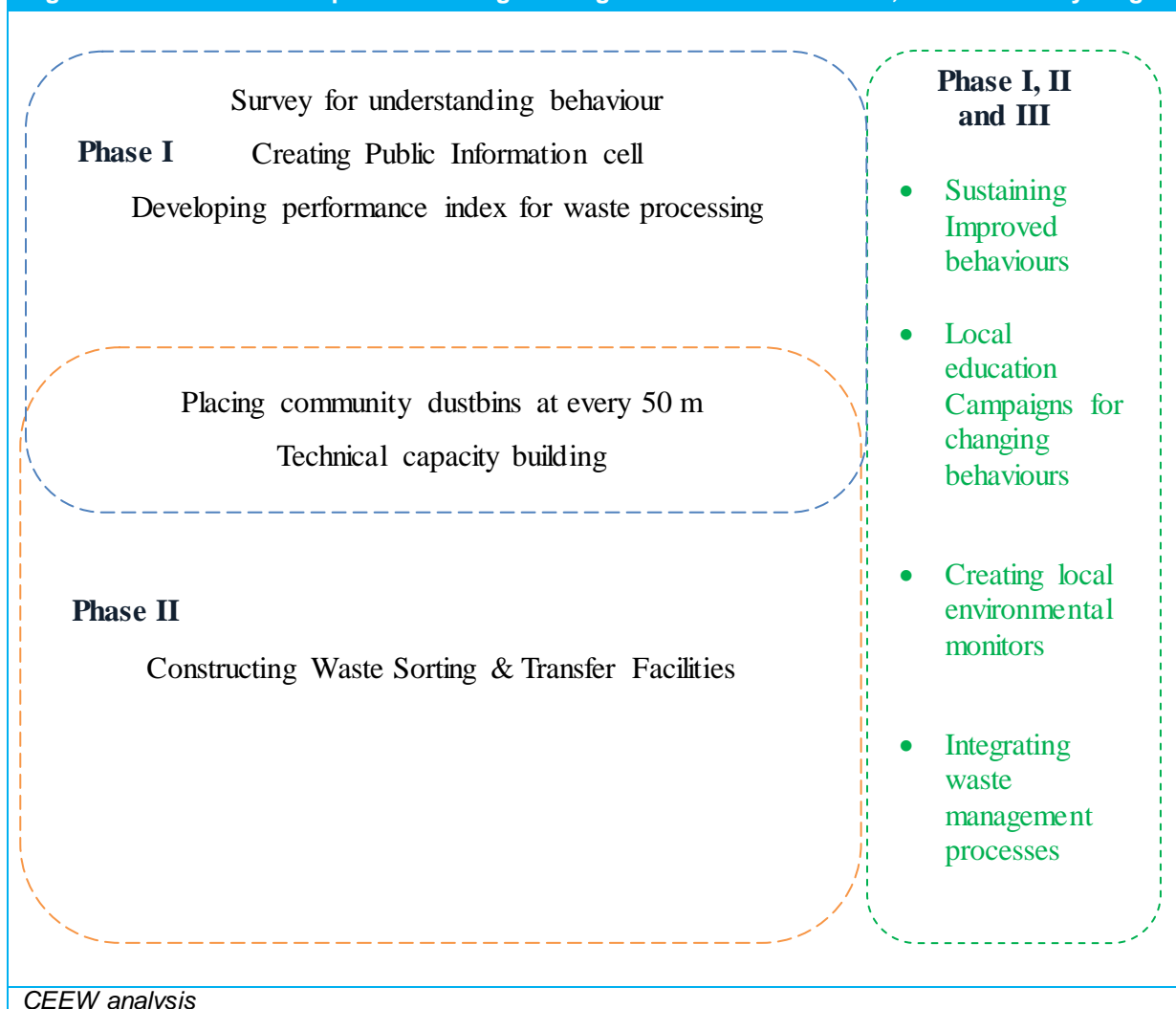
How: ULBs to nominate 1 RWA per zone to act as cleanliness monitors (check for compliance with cleanliness rules) and report to ULBs on an annual basis. The appointed RWA would have the responsibility to monitor timely cleaning, compliance with cleanliness norms and suggest possible interventions for making the local waste management process more efficient.

When: Phase I, II and III

Cost: INR 12.4 lakhs per Class 1 Urban Agglomeration /Town

Cost per capita: INR 0.42

Figure 6: Overall road map for achieving the target of “minimum landfill, maximum recycling”



4. OVERALL COST IMPLICATIONS

Rural sanitation cost in INR per Gram Panchayat		
Behaviour	45500	0.57%
Capacity	7280.355	0.09%
Infrastructure	7945334	98.93%
Management	33381.02	0.42%
Total cost	8031495	

Urban Solid Waste Management in Lakh Rupees per Urban Agglomeration		
Behaviour	33.02	2.45%
Capacity	218.63	16.24%
Infrastructure	1076.71	80.01%
Management	17.23	1.28%
Total cost	1345.59	

ANNEXURE I – ASSUMPTIONS AND REMARKS – RURAL SANITATION

- Cost calculations done in this exercise are conservative and averaged for a GP, they would therefore increase for Gram Panchyats having more households, schools, girl children in school etc., as compared to national averages. Therefore, we have also done cost estimation per household/per capita.
- On an average a Gram Panchayat (GP) has 706 households, so we assume that with 3 experts from NGO and 4-5 persons from GP sanitation team could conduct this exercise in 10 days. They could easily dedicate 2 days for mapping the defecating areas and rest 8 days could be spent (nearly 2 days in each village, as the average number of village per GP is 2.6) in organising several community as well as household level consultations, nukkad natak, audio-visuals etc., for creating a sense of pride for using toilets, and shame & disgust for defecating in open. Additional Rs. 500 is given for material arrangements per GP - these materials (audio-visuals, presentations etc.) could be used across the district. Contracting a single NGO for each district would ensure that even at a large scale, the average cost is low.
- There would be no cost incurred in using national radio and television channels for advertising. However, following MNREGA guidelines, one advertisement in a newspaper would cost Rs. 1000 and we are estimating 10 advertisements distributed across time thus amounting to 10000. We also advocate 2 permanent posters per GP (one per village) at a cost of Rs. 10000 per unit (MNREGA). Therefore the total cost of Rs. 30,000 would be required.
- According to experts, a single training of 20-30 people at a block level costs around Rs. 20000. On an average a block has 43 GPs, thus we are assuming that a total of 5 trainings (7-8 per GPs) would be sufficient.
- According to experts, a single training of 20-30 people at a block level costs around Rs. 20000. Assuming that the number of vendors would not be more than 40 per block, 2 trainings would be sufficient to cover the entire block.
- Training to every household is not possible, so a sample has to be selected from each GP and inclusion of community toilet, school toilet operators/care-takers is essential in this training. It is assumed that 5 training programmes per GP would be sufficient.
- Nirmal Bharat Abhiyan has formed a district sanitation committee, which comprises officials from different departments bringing in vast amount of expertise. They could easily provide training to block level facilitators, who in turn could train the GP and village level workers about the CLTS programme. However, if such a committee does not exist or essential expertise is missing, an external resource agency would have to be hired for training block level officers.
- It is essential for the trainers to be updated about the best practices and most importantly learn CLTS programme management skills. ASCI is regularly offering such courses for

the mid-level and senior level employees working in water and sanitation sector. Each training usually costs Rs. 20,000-40,000 per person, so an average cost of Rs. 30,000 has been assumed. In a district we assume training of 5 experts would be sufficient.

- Assuming one school per Gram Panchayat.
- Salary of Rs. 5000 has been reported as the salary of toilet cleaner in slum areas. We assume the same salary to one community toilet caretaker per village.
- We assume training of 20-30 people at the GP level for preparing an inventory of toilets would be sufficient. We have allocated Rs.20,000 for this exercise.














ANNEXURE II – ASSUMPTIONS AND REMARKS – URBAN SOLID WASTE MANAGEMENT

- Cost calculations were done conservatively based on average and approximate figures. For instance, average population per city and average households per city were calculated from the total population of Class 1 Urban Agglomeration/Towns. Other project costs have been estimated based on previous waste management projects, products and infrastructures.
- As per the census 2011, we have considered 10% of the households for conducting social perception survey in 468 Class 1 cities. 11320 households would be taken from each Class 1 Urban Agglomeration /Town to represent the total population of 264.9 million population in Class 1 cities.
- For localised education campaigns designed on the basis of the social perception survey, a team of 20 trained local people would be selected for each Urban Agglomeration /Town. The campaign would be spread across 12 weeks - 2 weeks/zone in the Urban Agglomeration /Town in the second year of phase I and second year of Phase II. Costs per member includes infrastructure, training and compensation costs.
- Cost for the annual competition at a Urban Agglomeration /town level were calculated on the approximation of the scale of the event at Rs. 10,00,000/year. The amount included reward money and cost for organising the event at a public venue.
- The cost calculation for media advertising includes Rs. 10000 for print and Rs. 10,000 for digital media at Urban Agglomeration /Town and local levels on a monthly basis.
- Cost for one dedicated information cell in ULBs was taken at Rs. 9,36,000/ year, including salaries and O&M cost - for 2 public information officers for each ULB.
- The cost for enrolment for vocational training and technical course was taken at an average of Rs. 2,000/course. These suggestive costs were taken from other similar programmes running for vocational training purposes within the existing training establishments. It was assumed that 10% of the manpower has been already trained. Therefore, our calculations were to estimate the cost for the additional 90% requirements. This includes re-training of the existing workforce.
- Assuming that 15% of the community bins have already been installed, requirement of total 9,00,660 community bins of 500 litre capacity were calculated, each priced at Rs. 4000.
- A capital cost of 220 lakhs for building 1 unit of sorting and transfer station (mentioned in the Report of the Task Force on Waste to Energy, Planning Commission 2014) was assumed to calculate the per capita cost. The cost includes waste sorting equipment and infrastructure. Operational cost was calculated separately including incentives for rag pickers @Rs 2/kg of the recyclable waste sorted.

- The total cost was calculated on the figures extracted from the Hyderabad model of Public Private Partnership. Ramky Environmental Engineers Pvt. Ltd. proposed Rs 1431/tonne for integrated solid waste management project.
- 1 year research study to develop a performance index of waste processing units in India was priced at Rs. 25,00,000 including institutional cost, compensation for researchers and contingencies.
- Rs. 60,000/year was calculated as compensation to be given to the monitoring group or association (RWAs) for acting as local cleanliness monitors for each of the 4 zones in Class 1 cities.



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