



नीति आयोग
National Institution for Transforming India

NITI Aayog – CPR Open Seminar Series

“Conceptualising Zero-Waste in India under Swachh Bharat: Possibilities and challenges”

[Summary Report]

Room 122, NITI Aayog, Sansad Marg, New Delhi 110001

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NITI AAYOG-CPR OPEN SEMINAR SERIES

The NITI Aayog – Centre for Policy Research (CPR) Open Seminar Series aims to create a platform for deliberation on models for sanitation, including service delivery, through a series of thematic seminars with academic and research institutions, development partners, public and private organisations, NGOs and the three tiers of Government. The seminar series will help strengthen the understanding of the challenges and opportunities in sanitation by promoting evidence-based knowledge in the sector. The space seeks to initiate discussion by sharing experiences; lessons learned from successes and failures; alternative models of sanitation technologies and service delivery models; and studies of best practices. This platform will be a crucial tool to leverage the expertise of various stakeholders on urban sanitation, including service delivery, and create a feedback loop into government, aiding the Swachh Bharat Mission in being a dynamic and responsive programme on sanitation. The presentations and subsequent discussions will be summarized as thematic discussion briefs for wide dissemination.

The National Institution for Transforming India (NITI) Aayog of the Government of India has been established to evolve a shared vision of national development priorities, sectors and strategies with the active involvement of States in the light of national objectives. This effort is part of its mandate to provide advice and encourage partnerships between key stakeholders and national and international like-minded Think Tanks, as well as educational and policy research institutions and to create a knowledge, innovation and entrepreneurial support system through a collaborative community of national and international experts, practitioners and other experts.

The Centre for Policy Research (CPR) has been one of India’s oldest and leading public policy think tanks since 1973 and is a non-profit, independent institution dedicated to conducting research that contributes to a more robust public discourse about the structures and processes that shape life in India. CPR is implementing a policy research project that is focused on urban sanitation in Indian cities entitled Scaling City Institutions – For India: Sanitation (SCI-FI: Sanitation). The project has four thematic components focusing on national flagship programmes, action research in two medium-sized cities, sector-specific issues in the delivery of urban sanitation, and a pilot demonstration of city-wide sanitation service delivery in two small towns of Odisha state. For more information on the project please visit: <http://cprindia.org/sci-fi>

Conceptualising Zero-Waste in India under Swachh Bharat: Possibilities and challenges

In 2011, urban India generated 62 million tonnes of solid waste per year (Census)¹; this is slated to increase five-fold to 260 million tonnes per year by 2047 (TERI)². Under the Swachh Bharat Mission (SBM), 80% of the urban population (allowing for a 2% increase year-on-year) has to be covered for Solid Waste Management (SWM) services. It is therefore imperative that environmentally-sound, socially, and techno-economically viable SWM practices are adopted to ensure sustainability in the long run. Ministry of Environment and Forests (MoEF) has drafted SWM Rules in 2000. The 2015 draft amendments propose that every effort must be made to achieve the desired objective of zero waste (ZW); landfills are to be permitted only for non-usable, non-recyclable, non-biodegradable, non-combustible and non-reactive waste.

ZW strategy is based on the hierarchy of 3Rs, namely- *reduce*, *reuse* and *recycle*. This marks a shift from the cradle-to-grave approach, which focuses on landfills and incineration, to a cost-effective cradle-to-cradle (or circular economics) approach in managing waste, where the waste from one product serves as an input for another, thereby negating the need for dependence on landfills and incineration as the only strategies for SWM.

Initially coined by Palmer back in 1973³, the term “zero waste” gained currency in the 1990s with countries like Australia, New Zealand, and USA adopting its tenets. India’s adoption of ZW as a strategy for SWM has largely been at the local level driven by local governments such as Pune and Mysore, at the state-government level by states such as Gujarat, or by NGOs like Chintan, EXNORA, and Thanal. This Seminar focussed on the desirability and applicability of the ZW strategy in India, and the challenges faced in rolling this out, learning from national and international experiences.

¹ Task force on Waste to Energy. 2014. *Report of the Task Force on Waste to Energy: In the context of Integrated MSW Management*. New Delhi: Planning Commission. Available on http://planningcommission.nic.in/reports/genrep/rep_wte1205.pdf

² Infrastructure Development Finance Company Limited. 2006. *India Infrastructure Report*. New Delhi: Oxford University Press. Available on <http://www.iitk.ac.in/3inetwork/html/reports/IIR2006/Prelims.pdf>

³ Bartl, A. 2014. Moving from recycling to waste prevention: A review of barriers and enablers. *SAGE*, 32(9), 3-18.

AGENDA

15:00-15:05	Introduction & Welcome	Ms. Sindhushree Khullar, CEO, NITI Aayog
15:05 – 15:15	Zero-waste in India: Some Policy Questions	Mr. Shubhagato Dasgupta, Senior Fellow, Centre for Policy Research
15:15-15:35	Presentation: Motivating citizens and administration for zero-waste cities: The case of Pune, India	Mr. Kunal Kumar, Commissioner, Pune Municipal Corporation
15:35-15:55	Presentation: Pathways to Zero Waste in the Indian Context	Dr. Ashish Chaturvedi, Research Fellow, Green Transformations Cluster, Institute of Development Studies, University of Sussex
15:55-16:30	Open discussion	Moderated by Ms. Sindhushree Khullar, CEO, NITI Aayog

The list of participants is at Annexure I. The speaker profiles are at Annexure II. Full presentations and video recording of the seminar and discussions may be seen from: link <http://www.cprindia.org/events/4455>

Zero Waste in India: Some Policy questions

Mr. Shubhagato Dasgupta Senior Fellow, Centre for Policy Research

Mr. Dasgupta’s presentation traced the history and the spread of ZW concept from USA to other nations like New Zealand, Australia and the rest of the world. Waste has moved from the margins to the mainstream for policy maker. ZW strategy can be applied to industrial waste, wastewater and municipal solid waste. The presenter aimed to bring the attention of the discussion on how ZW can be used as a policy driver in India.

The presenter opened the seminar with a set of key questions:

- *What policy support* from State Governments and National Government help in generating awareness for waste management?
- *What mix of policies* can pursue the zero waste approach alongside the building of basic sanitation infrastructure for collection, transport and sanitary landfilling?
- How should *city level investments be phased* to strengthen the 3 R hierarchy, without compromising on the current day health and environmental impacts?
- How can cities ensure that capital investment they make in terms of treatment and disposal facilities do not have *a lockdown on the amount of feedstock* which places a cap on minimisation, reuse and recycling?
- If PPPs are implemented – how can one ensure this critical issue?
- *Beyond the local body* – how can the States and the National government support Reduction, Reuse and Material Recovery?
- Would a version of the *extended producer responsibility* approach to reuse, work in India?
- Individual or collective stewardship? Shared responsibility or full EPR?
- What policy approaches could help mitigate the Impacts on *existing livelihoods and businesses*?

- Could the NITI Aayog be the agency to develop a *negotiated medium term plan* with State Governments to move towards 3 R approaches in a systematic manner?

PRESENTATION 1: Motivating citizens and administration for zero-waste cities: The case of Pune, India

Mr. Kunal Kumar Commissioner, Pune Municipal Corporation (PMC)

As the 2nd largest city in Maharashtra, Pune produces 1,600 tonnes of garbage daily. The increasing quantity and complexity in handling of waste poses a serious challenge in making India *swachh* by 2019. The presentation by Mr. Kunal Kumar described Pune’s efforts towards achieving the status of a zero garbage city.

“Zero Garbage Pune” is an innovative project which centers on the idea of eliminating the need for landfills, adding value to waste and creating a paradigm shift from mere disposal of garbage, to the treatment of garbage as a renewal resource. The aim is to generate wealth out of waste. According to the presenter ZW means that:

“Garbage should be reused locally to avoid sending the trash to landfills”

In Pune, the waste is collected, stored then segregated for recycle and reuse. The remainder is transported for further processing and scientific disposal. The ZW strategy of the PMC has five key success factors: First, segregation of waste at the source, second, creating public awareness, third, decentralised processing of waste, fourth, community composting, and fifth, incorporation of informal economy in waste management.

In the year 2014-15, 80% of the households in Pune were covered by waste management services. However, there are pockets which do not benefit from these services. The presenter highlighted that there are gaps in implementation of this strategy especially in the slum areas where the presenter believes 1/3rd of Pune’s population resides.

Another initiative of the PMC was to roll out the ‘Zero Waste Ward’ Model in 2010 in K特拉j ward covering 45,000 residents where the focus has been to improve DTDC. Segregation of waste at source increased from approximately 10% in 2010 to 70% in 2012. Community involvement in composting and efforts of SWaCH in waste management significantly reduced waste transportation costs. The presenter pointed

out that waste sent to landfills has reduced from 10 tonnes/day to 2 tonnes/day, and as a result it has been possible to cap landfills, ensure no open dumping since 2010, and 100 % scientific disposal of waste. After its successful implementation this model has been replicated in 20 selected prabhags⁴ in a phased manner.

It needs to be noted that only 60% household waste is collected at source, and only 44% municipal solid waste is segregated. The success of this model is directly dependent on the ability and willingness of the citizens to pay the user fee. There is a lack of proper sorting sheds for secondary segregation. Inadequate staff for street sweeping and gaps in availability of scrap dealers too poses serious challenge.

PRESENTATION 2: Pathways to Zero Waste in the Indian Context

Dr. Ashish Chaturvedi, Research Fellow, Green Transformations Cluster, Institute of Development Studies, University of Sussex

The domestic material consumption in the Asia Pacific region has surpassed that of rest of the world. There is a need to rethink current consumption and production pattern and move from a throw away economy towards circular economy. Dr. Ashish Chaturvedi's presentation compared the waste profile of European Union vis-à-vis the rest of the world. He concluded by suggesting two pathways to achieve zero waste in India.

The presenter highlighted that the term “Zero Waste” is a catch phrase. Achieving 100% or ZW is an ideal situation. It is not possible to completely contain waste within the geo-political boundary of a nation, state, city or a ward. The focus should instead be on minimising waste by strengthening the circular economy wherein there is no end waste product. This economic model requires incorporation of informal sector. The presenter defined circular economy as:

“an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover

⁴ Prabhag: Usually two wards are clubbed together to form a Prabhag. Each Prabhag has at least two councillors. Pune city has approximately 152 Prabhags.

and regenerate products and materials at the end of each service life”.

The presenter pointed that the strategy adopted by EU to manage its waste is very different from the strategies adopted by countries in Asia. In UK and Germany, large amounts of plastic scrap are exported. India’s waste profile is similar to that of China but there are vast differences in scale. Both, India and China are net importers of waste. However, the difference lies in the scale. China’s import of paper scrap has increased 30 times in two decades.

Dr. Chaturvedi suggested two pathways namely, techno-nirvana and green transformations to achieve ZW in India. Techno-nirvana focuses on recovering the maximum value from the waste through large-scale and capital-intensive technology. This involves PPP and technology-based interventions. Challenges to this path include heavy investments and additional costs for pollution control.

The second pathway of green transformation recognises the resource-saving potential of skills, networks and decentralized infrastructure. Informal sector and decentralised waste sorting facilities is the key to this process. In this model, waste is segregated at source by households and other establishments like industrial and commercial. DTDC is managed by an informal sector, usually in the form of a collective. In this model, the repair and re-use industry are actively promoted and work in close partnership with product manufacturers.

The presenter pointed that collaboration across departments can be a key success factor of circular economy. It was also suggested that there is a need to engage with different stakeholders to bridge knowledge gap and validate technology.

The presentations were followed by an open discussion. Additionally, a total of 24 questions were received by NITI Aayog and CPR over social media (Twitter and Facebook) prior to the seminar. These have been categorised as questions on governance, behaviour change communication/information education and communication (IEC) for SWM, financing and strategy.

Responses to these questions were tweeted via the NITI Aayog and CPR twitter handles and posted on the NITI Aayog’s Facebook page.

ANNEXURE I: LIST OF PARTICIPANTS

Panelists

1. Ms. Sindhushree Khullar, Chief Executive Officer, NITI Aayog
2. Shubhagato Dasgupta, Senior Fellow, Centre for Policy Research
3. Kunal Kumar, Commissioner, Pune Municipal Corporation
4. Dr. Ashish Chaturvedi, Research Fellow, Institute of Development Studies (IDS), University of Sussex

Other Participants

5. B.N.Satpathi, Sr. Adviser NITI Aayog
6. Ashok Kumar Jain, Adviser (Rural Development), NITI Aayog
7. Srikara Naik, Adviser, NITI Aayog
8. U.K.Sharma, Adviser, NITI Aayog
9. Jitendra Kumar, Adviser, NITI Aayog
10. V.B. Singh, Director, NITI Aayog
11. Padma Kant Jha, Dy. Adviser (Water Sanitation), NITI Aayog
12. Gayatri Nair, Deputy Adviser, NITI Aayog
13. Dr. Kumari Dibya, NITI Aayog
14. Kunal Singh, YP, NITI Aayog
15. Aditya Bhol, Centre for Policy Research
16. Anju Diwvedi, Centre for Policy Research
17. Dhruv Arora, Digital Content Manager, Centre for Policy Research
18. Dibyendu Samante, Centre for Policy Research
19. Dr. Anjali Chikersal, Centre for Policy Research
20. Kanhu C pradhan, Centre for Policy Research
21. Kimberly Noronha, Centre for Policy Research
22. Mukta Naik, Centre for Policy Research
23. Nikhil George, Centre for Policy Research

24. Partha Mukhopadhyay, Centre for Policy Research
25. Preksha Jain, Centre for Policy Research
26. R. Seetharaman, Centre for Policy Research
27. Sonal, Centre for Policy Research
28. Supriya Ambwani, Centre for Policy Research
29. Swati Dhiman, Centre for Policy Research
30. Tripti Singh, Research Associate, Centre for Policy Research
31. Abhishek Das, Bharati Institute of Public Policy
32. Amitaaya, Chintan
33. Amrendra Kumar, Clean Credit Waste Management Pvt. Ltd.
34. Anmol, Research Intern, Being Newton
35. Arjun Kumar, IIDS
36. Arvind Singh, Waste Management Association
37. Ashish Aggarwala, TERI University
38. Ashvini Pandey, Indus action NGO
39. Avisam, JNU
40. Bedoshruti Sadhukhan, ICLET
41. Bhavika Aggarwal, School of Visual Arts, New York Quicks and Design
42. Charu Khowala, Fourth Lion
43. Chitra Mukherjee, Chintan
44. Devendra Singh, EXCEL Industries Ltd.
45. Divyashish Sharma, Legislative Asstt.
46. Dr.D.S.Shyni, Ministry of Drinking Water and Sanitation
47. Dr. Kusum Lata, Associate Prof., Indian Institute of Public Administration
48. Dr. N.B. Mazumdar, Tech. Adviser, IEISL
49. DRRK Singh, Sr MOH, DMC, Dehradun, Uttarakhand
50. Enrico Ruderis, Project Director, GIZ
51. Francesco Obino, Research Coordinator, Chintan
52. Garvit Jain (Student), Summer Fields School

53. Gayandra Bhanali, Student, National Law University
54. Gopal Swarup Prof (Visiting), USAP, GGSIP, University
55. Harijan Das, MMAQSUA Tech Ltd.
56. Indrajit, Umashri
57. Infa Javed, Quicksand
58. Kapil Yadav, ADOPT-A TRAIL
59. Kathivaran Muthu, University of Oxford
60. Kayo, Creative Director, KowKind
61. K.Murayama, DMILDC
62. Martanl Jha, JNU
63. Meesha Tandon, Sr. Manager, ICLES South Asia
64. Mohit Sharma, Research ASSO, Council on Energy Environment & Water
65. Poulami Choudhary, Programme Officer, Council Manager Environment & Water
66. Pranaav Parth, student, Mayo College, Ajmer
67. Pratibha Caleb, Research Intern, Council on Energy Entertainment & Water
68. Pravin Khushwaha, JNU
69. Pritpal Randhawa, JNU
70. Prof. Fiona Marshall, University of SUSSEX, UK
71. Rajkaran Singh Bhatti
72. Rhea Reddy, Student, BOSTON University
73. Richa Chaturvedi, Law Researcher, National Green Tribunal
74. Riddhi Mittal, Starting (tech)
75. R.P. Dubey
76. R.P. Pandey, Group 101 Network
77. Sahadev Singh, DMRC
78. Sahil Singh Kapoor, Student, TERI
79. Sangeeta Maunav, HUDCO
80. Sangita Vyas, r.i.c.e.
81. Saneera Dev, SPA
82. Sanjay Hazarika
83. Sanyam Jain, student, DPS Mathura Road
84. Saunya Chandhok, Faith Academy
85. Saurabh Sinha, Law Researcher
86. S.C. Sharma
87. Shashi B Pandit, AIKMM
88. Shivani Karmarkar, COGENCIS
89. Shubhadit Sharma
90. Sundeep Narwani, Delhi Dialogue Commission
91. Suneel Pandey, Associate Director, TERI
92. Shweta Sharma, Tech Start up
93. Snehal ladke, Student (NIFT)
94. Sweta Celine Xers, Student, Ambedkar University, Delhi
95. Tamanna, Intern, Indus Action
96. Upmanyu Trivedi, COGENCIS
97. Valen
98. Yashaswini KS
99. Yogesh Gautam, GM, Sales, MMAQSUA Tech Ltd.

ANNEXURE II: SPEAKER PROFILES

Kunal Kumar is a 1999 batch IAS officer from the Maharashtra cadre, currently serving as Commissioner, Pune Municipal Corporation. Mr. Kumar has received four awards for effective e-governance, and in 2012 bagged the Aadhar Governance and Excellence Award from the Centre for implementing the Aadhar programme in Aurangabad. He is an electrical engineer by training and has earlier served in the Nagpur and Kohlapur municipal corporations. Pune is one of the cities that has rolled out its Zero-Waste strategy on a ward by ward basis, and in February 2015 announced that this will be rolled out to a further 10 wards. Through this model, Pune has saved more than Rs. 15 crore p. a. in waste handling costs, has generated about 1 megawatt energy from 100 tonnes of organic waste using biogas, and has achieved 100% scientific disposal since 2010 with no open dumping.

Dr. Ashish Chaturvedi is a Research Fellow at Green Transformations, Institute of Development Studies (IDS), University of Sussex. He has over 14 years of professional experience and specialises in climate change mitigation, waste management, sustainable consumption and production, and environmental policy. His current focus is on issues related to the circular economy and the drivers for Green Transformations. Before joining IDS, Dr. Chaturvedi led the Policy for Environment and Climate component of the bilateral Indo-German Environment Programme. As a Senior Advisor with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, he advised the Indian Ministries and Departments at various levels of Government and implemented projects in the area of waste/resource management, climate change and economic instruments. He was a part of a multi-stakeholder group responsible for drafting the E-Waste Law in India and has been a member of multiple committees at the state and national government level. Dr. Chaturvedi has published extensively in books, journals and general interest magazines. He has also presented at various national and international conferences. A PhD in Economics from the University of California at Irvine, Dr. Chaturvedi's PhD thesis explored the role of influence activities on the electoral process, policymaking in environments characterised by asymmetric information and quality of public good provision by non-government organisations.

Shubhagato Dasgupta is a Senior Fellow at the Centre for Policy Research, New Delhi, and Director of the Scaling City Institutions for India (Sci-Fi) Sanitation initiative at CPR. His current research focuses on drinking water and sanitation in India and the world, with particular reference to flagship government programs and service delivery challenges in smaller cities. Other major areas of work include urban infrastructure and service delivery financing, housing and slum rehabilitation, urban sector public finance, and urban environmental infrastructure planning, management, and investment, alternatives. Before CPR, he led the Support to National Policies for Urban Poverty Reduction project, a collaboration between the UK’s Department for International Development (DFID) and India’s Ministry of Housing and Urban Poverty Alleviation to develop pro-poor urban policies. He has also worked on issues of urban development with a wide range of other public, private, multilateral, and non-governmental organisations, including as Senior Urban Specialist at the World Bank, Assistant Vice President at the Infrastructure Development Finance Company (IDFC), the Housing and Urban Development Corporation (HUDCO) and The Action Research Unit. In addition Shubhagato has also been worked on private sector participation projects in urban and drinking water programs in eastern and southern Africa for the International Finance Corporation and the Acumen Fund. Shubhagato Dasgupta was trained as an architect at the Centre for Environmental Planning and Technology in Ahmedabad and holds an MSc in housing and development planning from the Development Planning Unit of the University College London. He is also currently undertaking a PhD at the Centre for Urban Studies at the University of Amsterdam.