

Kurukshetra Summary October 2017

The Economics of Investing in Swachhta

- India leads the infamous list of countries with the highest number of people practicing open defecation. It has been a way of life for millions of people in India for centuries.
- Successive governments have been running national sanitation programs since the 1980s, but till 2014, only 39 percent of Indians had access to safe sanitation.
- This is because the access to sanitation is not an infrastructural problem, there is deeper behavioural and socio cultural context at play, influencing a change in behavior of 60 crore people is a challenge that has probably been never taken by anyone in this world.
- The importance of sanitation is well documented, with its effects on child mortality due to diarrhoeal diseases, and the safety, security and dignity of women being clearly established.
- A study by the World Bank estimates that nearly 40 per cent of India's children are physically and cognitively stunted, primarily because of the lack of sanitation. Such a large proportion of our future workforce not being able to reach their full productive capacity poses a serious threat to our biggest strength- our demographic dividend.
- The World Bank also estimated that the lack of sanitation costs India over 6 percent of our GDP.
- A recent study by UNICEF on the economic impact of sanitation has estimated that in an open defecation free village, each family saves over Rs. 50,000 per year on account of avoided medical costs, time savings and life saved.
- Additionally, there is a huge potential of generating wealth from waste through good solid and liquid resource management.
- The study also concluded that the economic benefits of sanitation per household outweigh the cumulative investment by 4.7 times over a 10 year period.
- Private players are also playing a big role in SBM. Several private companies have worked especially for sanitation in schools through their CSR funds. But there is still a large potential to leverage the private sector's creativity and innovation for the SBM.
- The SBM is fast becoming a mass movement, or in the words of the Prime Minister- a Jan Andolan. It has already successfully brought down the number of people defecating in the open in India to a little over 30 crore, with over 68 percent Indians now having access to safe sanitation. But there is still a long way to go.

Swachhta hi Seva campaign

- On September 15, 2017, the President of India launched a nationwide campaign "Swachhta hi Seva" at Iswarigunj village in Kanpur. The President administered the Swachhta hi Seva pledge whereby the Nation resolved to create a clean, healthy and new India.
- Mahatma Gandhi had once famously said "sanitation is more important than political Freedom". Inspired by this, the government launched the Swachha Bharat Mission (SBM).

- The aim of Swachha Bharat Mission is to achieve a clean and open defecation free India by October 2, 2019.
- The objectives are generating demand for toilets leading to their construction and sustained use by all household members, promoting better hygiene behavior, amongst the population and improving cleanliness by initiating solid and liquid waste management projects.

Achievements

- In the last 3 years, under the Swachh Bharat Mission, 48,264,304 toilets were constructed.
- Open defecation free villages reached 2,38,966.
- 5 states have declared themselves open defecation free.
- SBM sought to reform the sanitation sector with the primary focus being on behavioral changes as the fundamental tool for achievement of Open Defecation Free outcomes.
- Inclusiveness under the Swachha Bharat Mission was achieved by designing public and community toilets keeping in mind the special needs of menstruating women, the elderly, the specially-abled and small children.
- The swachhaSarvekshan was conducted for rural India to evaluate the performance. National level monitors were hired to carry out sample-based checks of sanitation coverage and open defecation free status across the country.
- A massive survey covering 92,000 households, in 462 villages across the country is being conducted. An additional 200 villages located on the banks of river Ganga are being surveyed.

Conclusion:

- The Swachhata hi Seva campaign seeks to mobilize people to come out and get directly involved with the Swachha Bharat Mission by offering Shramdaan for swachhta in the fortnight leading upto Gandhi Jayanti.

SBM: Effective Communication Strategy For Behaviour Change

- According to Census 2011, India's 68.84 percent population lived in villages.
- The revelation from census that only 32.70 percent households had access to toilets in rural areas, which implied that two thirds of rural households did not have access to toilets, stunned the Government.
- Using unimproved sanitation facilities leads to contamination of ground water and pathogen contamination leads to diarrhoeal diseases. Each episode of diarrhoea leads to loss of nutrients from the body, which is connected to malnutrition, stunting and death.
- In absence of effective Behaviour Change Communication (BCC) and Information Education and Communication (IEC), the earlier sanitation programs showed a little improvement in terms of coverage of households with toilets and resulted in short term usage of toilets.
- The sub-group recommendations emphasized on higher allocation towards behavior Change Component, involving political and social/thought leaders, celebrities and media houses, and positive/dignified outlook toward cleaning occupation.

- The sub-group also recommended using education as a strategy for the Mission by making sanitation as a part of school syllabus and harnessing the potential of children as change agents. To form a group of students which may further lead to sanitation in their respective areas is the key to bring positive change of mind-set towards sanitation.
- Behavior change communication (BCC) is of immense importance as it may serve as a platform for informing, educating and persuading people to realize their roles, responsibilities, and benefits accruing from investing in correct sanitation practices.
- The communication at the community level can be supplemented by a mass media initiative, which focuses on changing social and cultural norms regarding open defecation and maintaining a clean environment through environment building and reminder services.
- Regular cleanliness campaigns are being organized by Ministry of Drinking Water and Sanitation (MDWS).
- Massive media campaigns are being organized at the national level using Audio Visual (TV) and audio (radio).
- There is a national Swachh Bharat Group on Hike App, with representatives from all the states and selected districts.
- Through a national IEC Consultation and other workshops, efforts have been made to maximize the benefits from IEC interventions and funds meant for this purpose.
- Ministry of Housing and Urban affairs launched a media campaign at Central level, which includes a film captioned “Yahihaiaslitarakki”, publishing of Amar Chitra Katha on sanitation in English and Hindi and launched an e-learning portal to expand the training of ULBs’ officials.
- In September 2017, the Ministry of Drinking water and sanitation organized Swachhaton 1.0-the swachh Bharat Hackathon, to crowd source solutions for the pressing issues pertaining to Sanitation. The primary target was youth from rural areas who could come up with innovative solutions.
- Further, in response to the Prime Minister’s call to the nation to Quit Filth, it was announced by the Minister, MDWS that the SBM (Gramin) will celebrate the week leading up to the 70th Independence Day as “KhulemeinShauch se Azadi” saptaah.
- SwachhtaRaths are mobile vans equipped with LED panels for screening Swachhta Films and also a NukkadNatak Team for community engagement in villages.
- All 4480 villages on the bank of River Ganga were declared open defecation free (ODF) under NamamiGange. Ganga Gram is a joint initiative of MDWS and MoWR, RD&GR to make the villages Aadarsh Gram.
- The Ganga Gram initiative would focus on better cleanliness and infrastructure facilities like Solid and Liquid waste Management (SLWM), rejuvenation of ponds and water sources, water conservation projects, organic farming, crematorium and overall convergence with other government departments and projects.
- Union Minister, MDWS and eminent film personality, Akshay Kumar, undertook a toilet pit emptying exercise in Raghwan village, in Khargone district of Madhya Pradesh for eliminating the taboo of villagers from cleaning the toilet pits.
- For the promotion of toilet usage across the country’s villages, the Ministry of Drinking water and sanitation has come out with an aggressive new campaign called Darwaza Band, it is designed to encourage behavior change in men who have toilets but are not using them.

- The Quality Council of India (QCI) conducted a transparent third party assessment of the present status of rural sanitation in all the states and UTs, called SwachhaSurvekshanGramin 2017, it found the overall toilet coverage to be 62.45 per cent. The survey also observed that 91.29 percent of the people having access to a toilet, use it.
- The intense Behavior Change Communication strategy adopted by the Government could be a reason for this high percentage of usage of toilets in rural India.
- To encourage states and districts to improve their sanitation coverage and Solid Liquid Waste Management (SLWM), the MDWS has decided to begin ranking all districts in India based on the data available on the SBM-G IMIS quarterly.
- The Mission has been successful in terms of covering the rural households with the toilet as the country has achieved the coverage of 69 percent at the national level in terms of household covered with the toilets which were 39 percent at the launch of the mission.
- In the month of September 2017, the country has around 5.20 crore households without toilets. Out of 5.20 crore households around 2.70 crore households without toilets are in the states of Uttar Pradesh and Bihar. The Ministry should come up with the special strategy for these two states to turn the dream of open defecation Free India.

SWACHHATHON: HARNESSING THE CREATIVITY OF MILLIONS FOR SWACHH BHARAT

- Swachhathon 1.0- A Swachhata Hackathon was organized by the Ministry of Drinking Water and Sanitation to crowd source innovative ideas to solve the sanitation related problems (including hygiene) being faced by the country and also to incubate the ideas to develop sustainable solutions.
- Entries were received under 6 categories that included 'Operation and Maintenance' of school toilets', Behavior change communication', and often forgotten issues of 'MHM'.
- It invited innovative technology based solutions to some of the most challenging questions being faced by SBM:
 - how to measure usage of toilets in a non-intrusive manner at scale;
 - frugal toilet technology designs for difficult terrains;
 - ways to leverage technology to promote maintenance of school toilets;
 - technological solutions for safe disposal of menstrual waste and technologies for early/instant decomposition of faecal matters.

Glimpses of few innovations:

- Mr. Ram prakash Tiwari from PHED department, Arunachal Pradesh came up with an innovation where instead of bricks bamboo with plastic lining could be used in the twin pit technology. This innovation uses local material and expertise of locals of Arunachal Pradesh. It also makes use of waste plastic.
- School students from Tamil Nadu innovated with plastic cans to make low- cost urinals. This was successfully implemented in Koppal district in Karnataka.
- The contest is not an end in itself; it has created a sustainable ecosystem for innovation in Swachhta. The viable solutions arising from the process will be listed out and documented as an e-book, and solutions with potential for scale –up shall be piloted with the help of incubators and partners.

Way forward:

Swachhathon is not the answer to all the problems but sure is a stepping stone to the change that's needed. The uniqueness to this initiative lies in its scale and reach, innovations proposed ranged from students to officials to practitioners to scientists.

Biggest Toilet in the world being built in India

- According to the founder of Sulabh International, DrBindeshwar Pathak, the world's largest toilet is being in India.
- This toilet in Pandarpur, near Pune border in Maharashtra has 2,858 seats.
- Before this feat, only China had toilets with 1000 seats.

WASTE TO WEALTH: THE WASTE MANAGEMENT ALTERNATIVES

- Rapid increase in urbanization and per capita income lead to high rate of municipal solid waste generation. In recent times, E-waste and plastic waste also contribute considerably to total waste stream due to utilization of electronic and other items.
- These wastes may cause a potential hazard to human health or environment if any of the aspects of solid waste management is not managed effectively.
- Even today, large portion of solid waste is dumped indiscriminately on outskirts of towns or cities without any prior treatment. This leads to groundwater contamination and increase in air pollution due to leachate percolation and release of gases respectively.

India- waste Generation Scenario:

- Every year, about 55 million tones of municipal solid waste (MSW) and 38 billion litres of sewage are generated in the urban areas of India.
- It is estimated that the amount of waste generated in India will increase at a per capita rate of approximately 1-1.33 percent annually. This has significant impacts on the amount of land that is and will be needed for disposal, economic costs of collecting and transporting waste, and the environmental consequences of increased MSW generation levels.

Waste to Wealth:

- About 32.8% of India's population is urban and is increasing at 3-3.5% per annum.
- At the present rate, waste generation is projected to increase from 62 million tonnes per year to about 165 million tonnes in 2030.
- According to data of MoEF, only about 75-80% of the municipal waste gets collected and only 22-28% of this waste is processed and treated.
- With growing public awareness about sanitation, and with increasing pressure on govt. and urban local bodies to manage waste more efficiently, the Indian waste to energy sector is poised to grow at a rapid pace in years to come.

Types of wastes:

Wastes can be broadly classified into:-

- 1). Urban Waste
- 2). Industrial waste

- 3). Biomass waste
- 4). Biomedical waste

Importance of waste to energy:

- Most wastes that are generated, find their way into land and water bodies without proper treatment causing severe water pollution. They also emit greenhouse gases like methane and carbon dioxide, and add to air pollution.
- The problems Caused by solid and liquid wastes can be significantly mitigated through the adoption of environment-friendly waste-to-energy technologies that will allow treatment and processing of wastes before their disposal.
- These measures would reduce the quantity of wastes, generate a substantial quantity of energy from them, and greatly reduce environmental pollution.
- Although the cost of waste to energy is somewhat higher than other renewable sources, it is still an attractive option, as it serves a dual role of waste disposal and energy production.

Need for a New Energy Source:

- The high volatility in fuel prices in the recent past and the resulting turbulence in energy markets has compelled many countries to look for alternate source of energy.
- Also, there is increasing pressure on the Government and urban local bodies to manage wastes more efficiently.
- In addition to energy generation, waste-to-energy can fetch significant monetary benefits.
- Some of the strategic and financial benefits from waste-to-energy business are:
 - Profitability: if the right technology is employed with optimal processes and all components of waste are used to derive value, waste to energy could be a profitable business.
 - Government incentives: in the form of capital subsidies and feed in tariffs.
 - Related opportunities: Depending on the technology/route used for energy recovery, eco-friendly and 'green' co-products such as charcoal, compost, nutrient, rich digestate (a fertilizer) or bio-oil can be obtained. These co-product opportunities will enable the enterprise to expand into these related products, demand for which are increasing all the time.
 - Emerging opportunities in the form of huge demand.

India waste to energy potential

- According to the Ministry of New and Renewable Energy (MNRE), there exists a potential of about 1700 MW from urban waste and about 1300 MW from Industrial waste. Of this, only about 24 MW has been exploited.

Technologies for the Generation of energy from waste:

Energy can be recovered from the organic fraction of waste through thermal, thermo-chemical, biochemical and electrochemical methods.

- Thermal conversion: the major technological option under this category is incineration.

- Thermo-chemical conversion: they are useful for wastes containing high percentage of organic non-biodegradable matter and low moisture content. The main technological options under this category include Pyrolysis and Gasification.
- Bio –chemical conversion: this process is preferred for wastes having high percentage of organic, biodegradable matter and high level of moisture, which aids microbial activity.
- Electro-chemical conversions: these systems are developed to trap the energy from wastes, where the reduction-oxidation machinery of immobilized microbial cells is catalytically exploited, for the accelerated transfer of electrons from organic wastes, to generate electricity and bio-hydrogen gas.

Installed Grid Interactive Renewable Power Capacity in India 2017		
Source	Total Installed capacity (MW)	Target 2022 (MW)
Wind Power	32279.77	60,000
Solar Power	12288.83	100,000
Biomass Power (Biomass & Gasification and Bagasse Cogeneration)	8182	10,000
Waste to power	114.08	
Small Hydropower	4379.85	5000
Total	5724423	175,000

Off-grid power Capacities in MW	
Source	Total Installed Capacity (MW)
Biomass (non-bagasse) Cogeneration	651.91
SPV Systems	438.95
Biomass Gasifiers	186.88
Waste to Enrgy	164.45
Water mills/ micro hydel	18.81
Aero-Generators/Hybrid systems	2.98
Total	1463.98

Constraints faced by Waste to Energy Sector:

- Waste-to-energy is still a new concept in the country. Most of the proven and commercial technologies in respect of urban wastes are required to be imported.
- The cost of the projects especially based on biomethanation technology is high as critical equipment for a project is required to be imported.
- In view of low level of compliance of MSW rules 2000 by the Urban Local Bodies, segregated municipal solid waste is generally not available at the plant site, which may lead to non-availability of waste-to-energy plants.
- Lack of financial resources with Urban Local Bodies.
- Lack of conducive policy guidelines from state Governments in respect of allotment of land, supply of garbage and power purchase/ evacuation facilities.

Conclusion:

- There is a need to cultivate community awareness and change the attitude of people towards waste, as this is fundamental to developing proper and sustainable waste management systems.
- Sustainable and economically viable waste management must ensure maximum resource extraction from waste, combined with safe disposal of residual waste through the development of engineered landfill and waste –to-energy facilities. Waste-to-energy (WTE) are among the most efficient ways to convert garbage to electricity. It is time all cities pay attention to this source for power as an economical way to tackle the city waste.

NATIONAL MISSION FOR CLEAN GANAGA: THE CHALLENGES AHEAD

- Before the advent of the National Mission for clean Ganga (NMCG), river Ganga was facing the challenge of its existence due to discharge of increasing quantities of sewage, trade effluents and other pollutants on account of rapid urbanization and industrialization.
- It has a catchment area of 8,61,404 square km covering over a quarter of country's land area and sustaining 46 percent of the total population of the country.
- The National Mission for Clean Ganga (NMCG) was created in June 2014.
- The main activities undertaken under NamamiGange include sewage and effluent management including creation of new and rehabilitation of existing STPs, complete sanitation coverage of Gram Panchayats, development of model cremation/dhobi ghats, development of decision support system in GIS platform for efficient planning and monitoring and creation of an IT based monitoring centre with capabilities of real time alerts and prediction.
- Due importance has also been accorded to bio diversity, conservation, maintenance of flow in the river and afforestation along river side with medicinal and native plant species along with conservation of aquatic species.
- Biodiversity Conservation is being implemented in association with Wildlife Institute of India to cover Golden Mahaseer, Dolphins, crocodiles, Turtles and Otters etc under conservation programme.
- Although huge funds have been allocated, the pace of utilization of fund under this programme has not been satisfactory. The slow implementation of project is attributed to delay in tendering, retendering, non availability of land, legal issues, natural calamities, delay in permission for road cutting, crossing, local festivals, higher fund requirement and pending approvals of state Cabinet etc.
- The orders issued through the Gazette of India on 7th October,2016 constituting River Ganga (Rejuvenation, Protection and Management) Authorities under the Environment Protection Act, 1986 lays down a new institutional structure for policy and implementation in a fast track manner and empowers NMCG to discharge its functions in an independent and accountable manner.
- The key principles identified for the Authority are:
 - Maintaining the continuity of the flow without altering the natural season variations.

- Restoring and maintaining the integral relationship between the surface flow and subsurface (ground water).
 - Restoration and maintenance of the property and quality of water in a time bound manner.
 - Regenerating and maintaining the lost natural vegetation in catchment area.
 - Regeneration and conservation of the aquatic and riparian biodiversity in river Ganga basin.
 - To keep the bank of river Ganga and its floodplains as construction free zone to reduce pollution sources and maintain its natural ground water recharge functions.
 - Making public participation an integral part of process of rejuvenation, protection and management of the river.
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- Awareness activities are being taken up through Pad yatras, cleanliness drives, painting competition for children, shramdaan, talkshows and dialogues etc. NamamiGange song has been released and played on digital media and during public events.
 - For involvement of public in monitoring of pollution entering into the river Ganga, Bhuvan Ganga web app and mobile app have also been launched.

Conclusion:

- For pollution abatement and cleaning exercise in river Ganga, the policy making authorities at higher level have emphasized the need of close monitoring, focus on minimizing waste generation and disposal of waste in an ecofriendly manner and publicizing the use of electric crematoria for enhancing its acceptability among the masses.
- Uploading the monitoring reports in public domain has been recommended. State Ganga committees and District Ganga committees have been formed to ensure effective implementation and participation of people in protection and rejuvenation of Ganga.