INDIAN WATER WORKS ASSOCIATION, MUMBAI CENTRE

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DROPLET

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from Chairperson Desk

The water footprint is an environmental indicator that measures the volume of fresh water used throughout the entire production chain of a consumer item or service. Water footprint includes three types, Green water footprint, Blue water footprint, and Grey water footprint covering the entire chain.

The importance of the water footprint is that it helps to highlight the water needs of our daily consumption of goods, the problems of water depletion and pollution that exist in the regions where these goods are produced. Water Footprint Assessment is a four-phase process that quantifies and maps green, blue and grey water footprints, assesses the sustainability, efficiency and equitability of water use and identifies which strategic actions should be prioritised in order to make a footprint sustainable. Key factors that affect water footprint are Total volume of consumption, Water-intensive consumption pattern, High consumption of industrial goods, Climate and Water-inefficient agricultural practices.

There are large differences in the water footprint of consumption of nations. Also, the differences in the internal and external water footprint of consumption are also large. For few countries, very high of the water footprint of consumption lies somewhere else in the world through imported goods, whereas for few other countries, very low of the national water footprint of consumption is external.

The prime reasons being very low agricultural yields and associated large water

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Editor Brief

The United Nations Climate Change Conference COP27 was held in Egypt recently with a breakthrough agreement to provide "loss and damage" funding for vulnerable countries. Cities are hubs of population and economic activity in our country and are susceptible to the impacts of climate. India's Long Term Low Carbon Development strategy includes city planning, buildings, and municipal services as focal areas to ensure that urban design in rapidly growing cities in India is climate resilient and can also contribute to India's overall efforts in sustainability.

Promoting low-carbon Municipal Service Delivery through resource efficiency and management of water, solid waste, and liquid waste has three components.

1) It Stresses on natural resources, unauthorised land use, untreated waste disposal, and problems of access to basic services, are intensifying with the growing urban population. Further, with extreme weather, most cities face the twin challenges of meeting increased demand for potable water, and management of excess water during extreme precipitation events.

2) Solid Waste accumulation and improper disposal severely affect the environment causing air, water, and soil pollution, which affects public health and causes ecological damage. In India, 147,613 metric tonnes (MT) of solid waste are being generated per day as of January 2020. Smaller towns and cities face challenges in managing waste effectively.

3) With city governance determined by Urban Local Bodies (ULBs), rapid urbanisation will require interventions from

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Expert's Article

Feasibility of Waste to Energy (WtE) Project in Metro City

Dr. Alok Kumar
Tata Consulting Engineers, Mumbai

Most wastes that are generated find their way into land and water bodies without proper treatment, causing severe water and 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.

The waste management for metro cities such as Mumbai is critical where daily waste generation is in the tune of 6500TPD and has very limited land area for its disposal in landfill sites. The WtE technology based on thermal processing such as incineration, pyrolysis etc has potential of reducing volume by 90% and weight by 80%. Some significant thought-provoking facts are listed below.

A) India generates about 62 million tons of Municipal Solid Waste annually. The projected waste generation by 2031 is 165 million tonnes.

B) The greenhouse gas emissions are expected to grow from 19 million tCO2e to 41 million tCO2e annually in a business as usual (BAU) scenario by 2030.

C) Only 23% waste is being treated/ recycled while 73% waste is landfilled

If the current trend of waste disposal is continued, the country would require 1450 sq. km. of land to dispose the waste

D) In case of Mumbai, the requirement of land for setting up landfill for 20 years (considering 10-meter-high waste pile) for ~2000 TPD waste could be as high as approximate 200 hectares of precious land

E) Waste-to-Energy project can achieve 90% volume reduction of the waste. The environmental benefits of waste to energy, as an alternative to disposing of waste in landfills, are clear and compelling.

F) 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. When government incentives are factored in, the attractiveness of the business increases further.

Government Incentives: The government of India already provides significant incentives for waste to energy projects, in the form of capital subsidies and feed in tariffs. With concerns on climate change, waste management and sanitation on the increase (a result of this increasing concern is the newly formed ministry exclusively for Drinking Water and Sanitation), the government incentives for this sector is only set to increase in future.

Change in Waste Composition: For MSW generated in Country, its composition has drastically changed over a period of time. The increase of recyclable fraction in composition of MSW generated in India has witnessed a phenomenal growth, due to which, recyclable fraction has increased over a period of time, paving forward a good opportunity for taking lead in Waste to Energy technologies for India.

Present Updates from Waste to Energy Market in India:

India has seen significant upsurge in Solid Waste to Energy Market in last 4 years.

Union Govt. has recognized Waste to Energy as a key for not only addressing Waste Treatment issues, but also as a Renewable source of Energy in India, which is an energy intensive and energy starved economy.

CERC has taken initiative to notify Tariff to buying Power from Waste to Energy Plants, recognizing them as Renewable Energy Resources.

MSW Rules 2016 has also made mandatory on Local Discoms to procure energy generated from Solid Waste to Energy Plants.

All industries located within 100 km of any City are required to switch 5% of their energy sourcing from MSW

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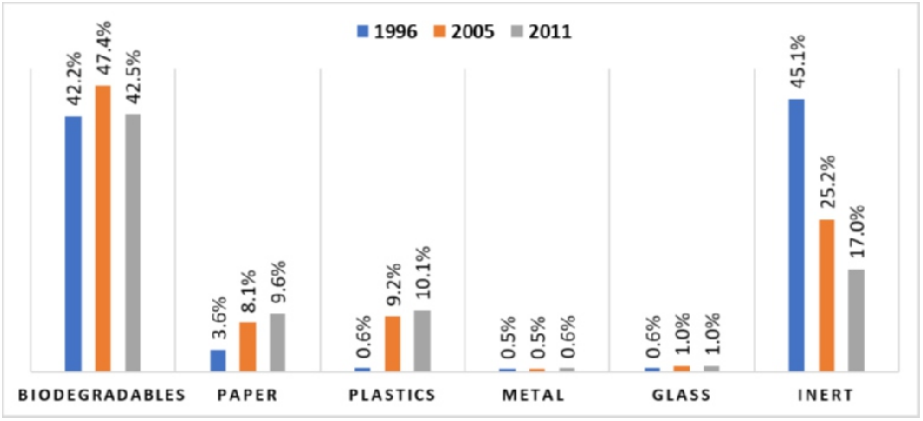

Change in Waste Composition of Indian Waste

Mr D R Bhise, An Eminent Water Engineer of India !!!

Founder President of IWWA

Mr D R Bhise was born on 10th October 1910, a date well known to his friends and well wishers as 10-10-10. He graduated in Engineering from the College of Engineering Karachi in the erstwhile Bombay state. He then joined the Bombay Municipal Corporation on the lowest rank of the ladder and after putting in 34 years of service, rose to the position of a Hydraulic Engineer, which he occupied for a period of 4 years till his retirement in October 1967.

During his tenure Mr Bhise maintained the Water Works of Metropolis of Bombay (daily supply of 2400 Mld) and executed several major construction works such as laying of 96" diameter mild steel pipeline (about 64 Kms in length) and construction of five reservoirs (capacities ranging between 5 to 60 Mld), treatment plants, pumping stations and bridges.

One of the outstanding works of his career was design and construction of 80 Mld Ulhas river project with head works, pumping station, 48" diameter pipeline and treatment plant which was completed in a record time of four months when the city was faced with acute water shortage. This project included a difficult construction of the 4 m diameter under creek tunnel, nearly 120 m below water level on Ulhas River.

Mr Bhise wrote and published a textbook on "Water supply". He also had several technical papers to his credit. He served as an examiner for B.E. Examination at University of Mumbai, Pune, Nagpur and Gujarat for subjects such as "Water supply" and "Hydraulics".

After his retirement, Mr Bhise founded the Indian Water Works Association (IWWA) in the year 1968 and was elected as its Founder President for the first two years. He also started the popular publication "the Journal of IWWA" in 1968 and worked as its Editor and publisher for a long spell of two decades. In fact "Champak", his residence was the de facto Head Quarters of the IWWA for several years. Those warm moments with Mr Bhise, his incredible hospitality and a great sense of humor will always be cherished.

Mr Bhise continued to be an active member of the council of Management (COM) of IWWA and took keen interest in various matters. In fact, he attended the last COM meeting held in July 2001 in Mumbai and actively participated.

Mr Bhise got the inspiration to start the IWWA from the American Water Works Association (AWWA). Today IWWA boasts 12000 plus members with 35 centers, spread all over the country and the Journal of IWWA has been one of the most sought after journals in the water works industry.

To many of us, IWWA HQ building has indeed been one of the greatest works of "construction" of Mr Bhise. Institution building is always a very difficult task and Mr Bhise did this with a vision and passion that remains unmatched. He will always be remembered for conceiving, establishing and developing the IWWA.

NEWS ROOM

A) The Annual General Meeting (AGM) of Indian Water Works Association (IWWA), Mumbai centre held on 12th Nov 2022 at Satkar Hotel Thane. About 20 members attended the AGM meeting. On this occasion IWWA Mumbai Centre felicitated the IWWA Senior Members as a token of respect. The senior IWWA members spoke during the felicitation and shared their association & experiences with IWWA.

B) IWWA Mumbai Centre donated Rs 25000/- for the printing of IWWA quarterly Journal.

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Feasibility of Waste to Energy

derived RDF.

Union Govt. is actively considering set up of Waste Generation Energy Authority to boost the WtE market.

More than 30 (Approx.) cities have either moved ahead or have finalized bids on Waste to Energy Contracts as preferred technology for processing of their waste.

Oldest SWM- WTE Plant at Timarpur, Delhi is expanding its waste intake to 4000 tons per day from present 1800 TPD, realizing that Delhi has additional waste for disposal.

Study on WtE- Govt. of India

The Kasturirangan Report of Task Force for Waste to Energy in the context of waste management has given relative scoring to several WtE technology options available. The scoring has been given in the range of 1 to 10 (1 being the least beneficial) to address suitability of centralized and decentralized systems for each unit operation. The experts were made aware of the rationale behind suggesting scores for each unit operations in MSW management. The scores are based on attributes such as technical feasibility, managerial, social acceptance, operation and maintenance advantage, capital cost and recycling potential. The Technology selection matrix is given in below table.

Based on the below table, Incineration is rated as the best suitable option followed by Biomethanation amongst all the studied technologies for waste to energy.

Conclusions : The WtE technology is most feasible for city like Mumbai where land parcels are most precious commodity. The typical setting of Mumbai in terms of its location being sandwiched with seashore (CRZ areas) and Sanjay Gandhi National Park (SGNP) i.e. Eco-sensitive zone (ESZ). Also, a large area is also affected by Thane Flamingo Sanctuary having no development zone.The WtE plant will definitely help in meeting the sustainable goals for the city and make land available for green areas.

Brihan Mumbai Municipal Corporation (BMC) has already taken initiative in this direction with award of 600TPD WtE project in 1st phase to Chennai MSW Pvt. Ltd and project is in implementation stage.

S.r NO	Technology	Technical Feasibility	Managerial Feasibility	Social Acceptability	Low Capital Cost Advantage	Low O & M Cost Advantage	Recycling Potential	Average	Total Score
1.	Bio-methanation	7	7	7	6	6	7	6.7	40
2.	Conventional Composting	6	6	7	5	6	6	6.0	36
3.	RDF Production	7	7	8	6	6	6	6.7	40
4	Pyrolysis/ Gasification	8	7	6	5	6	6	6.3	38
5	Plasma Arc Gasification	6	5	7	4	4	6	5.3	32
6	Incineration	9	8	6	6	7	6	**7.0**	**42**

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from Chairperson Desk

footprints per unit of harvested crop in some developing countries.

The world population is ever expanding stressing the higher need for fresh water. Therefore, measures to keep water footprint level low are the need of the hour to conserve fresh water supply. All concerned stakeholders including Government institutions, along with Manufacturers should work towards awareness and eventually developing a mechanism for reducing water foot print.

- Er. Maniessha Palande

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from Editor Brief

ULBs to be able to manage resources and deliver municipal services efficiently. These can include mainstreaming efficiency within municipal service delivery through resilient water management, improved water use efficiency, demand management policies and conservation of water sources, circularity in waste management, and recycling and reuse of wastewater..

- Er. Dilip Sonwane