

Waste Management PoA, India (GS4GG)



The Problem

It is common practice in urban and peri-urban areas in India to dispose of Municipal Solid Waste (MSW) in a landfill or other Solid Waste Disposal Sites (SWDS). While India has comprehensive laws and guidelines in place for the management of all types and streams of waste, such as the Solid Waste Management Rules, 2016, there are significant gaps in their enforcement and implementation that have resulted in improper handling, management and disposal of wastes. A 2019 article states that *“An estimated 377 million urban people live in 7,935 towns and cities and generate 62 million tonnes of municipal solid waste per annum. Only 43 million tonnes (MT) of the waste is collected, 11.9 MT is treated and 31 MT is dumped in landfill sites. The volume of waste is projected to increase from 64-72 million tonnes at present to 125 million tonnes by 2031”*.

While the Government of India, various state governments and other private players have established composting units and waste to energy plants, there is a huge cost associated with building and maintenance of these units. A number of these units are dysfunctional and non operational or not operating at capacity. Almost all municipal authorities deposit solid waste at a dump-yard within or outside the city haphazardly, even though there are designated spaces for landfills in all major cities.

Some of the issues seen in the waste sector are,

- Lack of implementation of MSW guidelines including rules on segregation and handling of waste
- Low rates of segregation at source
- Incomplete coverage of waste collection
- Illegal dumping of waste in non-sanctioned or unplanned areas due to lack of landfill space or improper handling or other issues
- Unsanitary landfills
- High Labour costs and costs of transport

These problems are exacerbated by an increase in India’s overall population, coupled with increasing urbanisation and consumption habits, resulting in a consequent increase in problems associated with waste, including pollution of soil and water bodies and adverse impacts on health. **Landfill sites contribute 20% of the global anthropogenic methane emissions.**

Toxic gas emissions from landfills pose a serious threat to the environment as well as on human health. Some studies have shown that toxic gases released from landfill sites are even responsible for lung and heart diseases in humans. Landfills also generate a toxic soup known as leachate, formed when waste is

subjected to biological and physico-chemical transformation. Leachate is highly toxic and causes land and groundwater pollution.

The mismanagement or improper handling and management of waste can lead to a number of environment and health hazards, including but not limited to,

1. Contamination of soil
2. Contamination of groundwater and water bodies
3. Unsanitary living conditions near dump sites/landfills
4. Greenhouse gas emissions
5. Other toxic gas emissions



About the Project

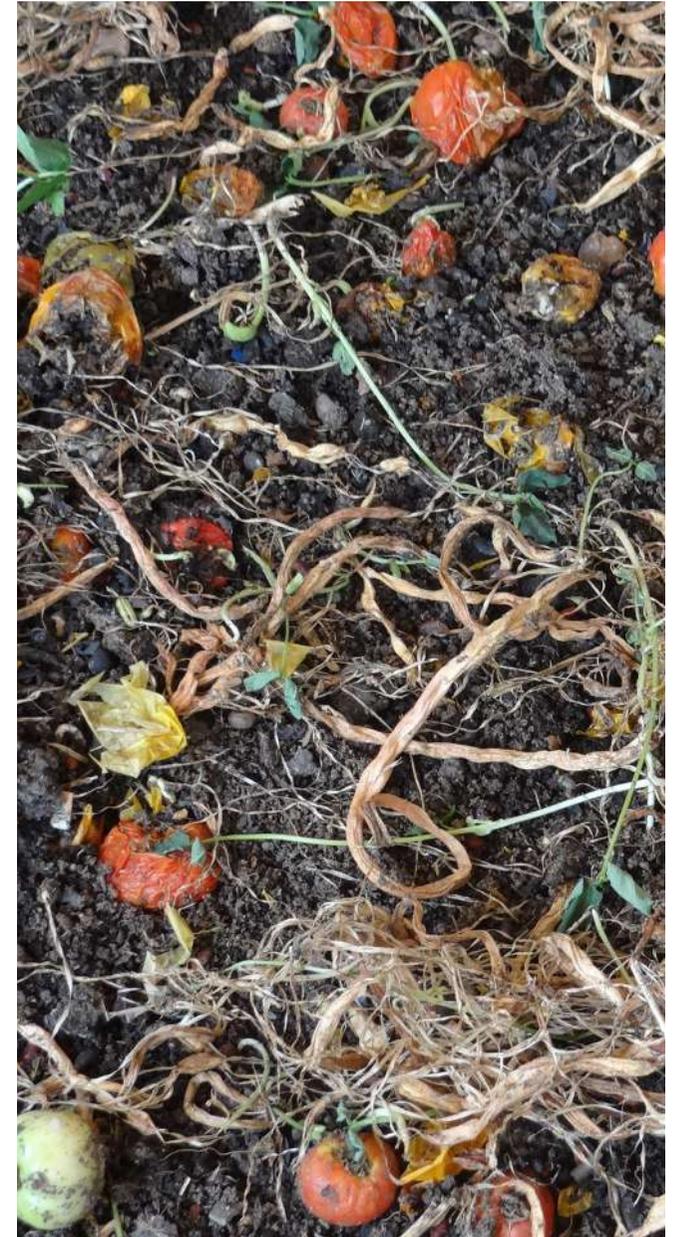
The aim of the programme is to enable expansion and scaling up of existing waste management units and technologies, as well as enable new units, facilities and improved technologies across the waste management sector in India through carbon revenues. The programme will enable organisations in the waste sector to maintain their current operations and scale up significantly, through the implementation of various technologies. The Implementation Organisations involved are all established and experienced in the field of waste management in the country.

The programme comprises private start-ups in the waste management sector, who implement a range of innovative waste management technologies, aimed at diverting waste away from landfills and dumpsites for efficient resource recovery. The various technologies will be employed at a central level such as a composting facility or large biogas plant, at the apartment or community level or even at the household level. The type and scale of the unit and the technology employed changes within and among Voluntary Programme Activities (VPAs). The main waste substrates utilised in the project activities are Municipal Solid Waste (MSW) mixed with an insignificant quantity of

animal wastes. The type and composition of substrate used will vary between the VPAs.

The project activities included are small scale and measures are limited to those that result in emission reductions of less than or equal to 60kt Co2 annually. The project applies the tool to estimate Co2 emissions associated with consumption of electricity in the project. The electricity is sourced from the grid.

- The programme is an umbrella carbon offset programme designed for organisations in the waste management sector in India. Carbon revenues from the PoA will help scale up operations of the various Project Participants (PP) and increase the proportion of waste processed.
- The programme seeks to use carbon finance as a sustainable model for organisations working in the waste sector in India to scale up and expand activities.
- The programme aims to address issues of asymmetries of participation, especially for small-scale project partners in key community-oriented areas and sectors in multiple cities across India.



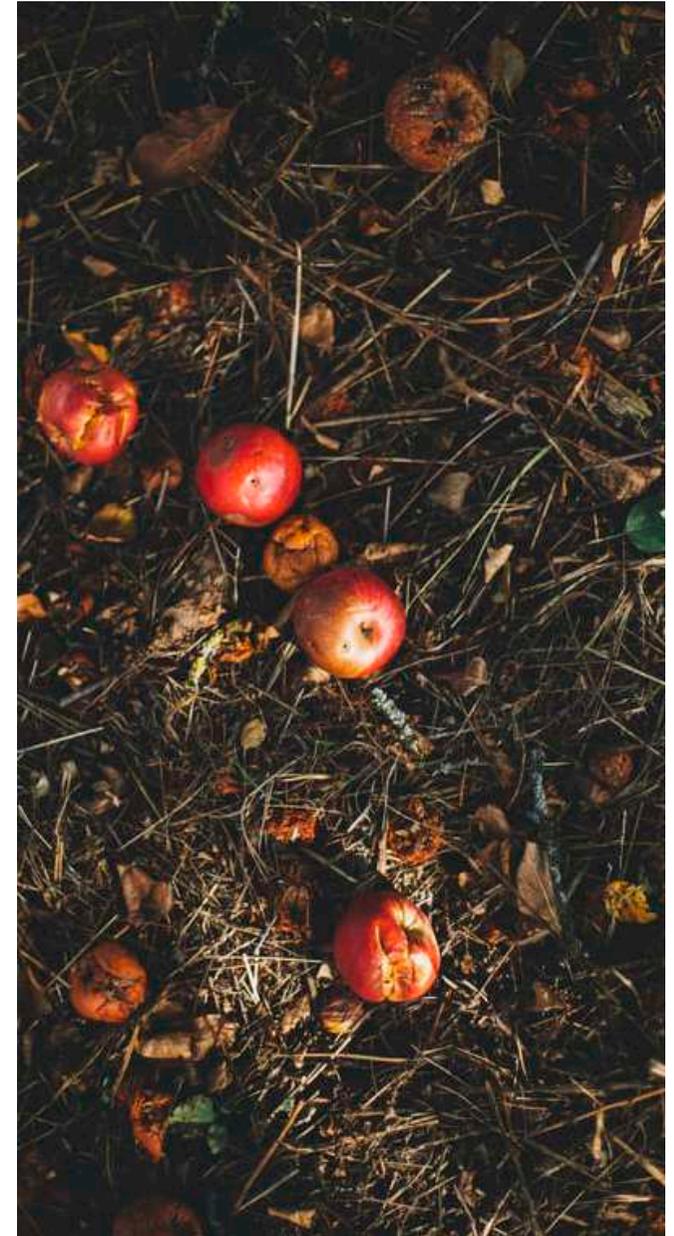
- The programme seeks to divert MSW away from landfills and other SWDSs and instead process it through several technologies including composting and waste to energy (biogas) technologies thus avoiding methane emissions from landfills.
- The programme includes installation of new power plants at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant), or involving a capacity addition or a retrofit to existing plants.
- Only installations generating less than 15 MW will be included in the PoA. In case of capacity addition, the installations accounted for under the PoA will be physically distinct from the existing units.
- The methane recovered is utilised for cooking, thermal energy, electricity generation and transport. A contract is signed between the producer and the end-user of the electricity generated to ensure no double counting of emission reductions.
- The programme shall also include recovery of materials from waste streams that would have otherwise been dumped or landfilled.
- The programme aims to displace the use of fossil fuels with biogas/Bio-CNG generated from biodigesters
- The programme involves installation and management of a number of centralised or decentralised waste management units, covering a range of technologies to process the waste generated and ensure proper handling of the same.



Project Objectives

The project will help to stimulate and commercialize the use of waste treatment technologies and markets. The specific goals of the project are:

- Diversion of wastes from landfills and other SWDSs and the subsequent avoidance of methane emissions
- Decreased transport of wastes to SWDSs
- Methane production and recovery for use in thermal applications, transport applications and electricity generation.
- Displacement of fossil fuels in thermal applications, transport applications and electricity generated from the grid
- Resource recovery from solid wastes resulting in less resource extraction and manufacture of new material
- Best practices for waste management and handling
- Reduction of harmful environmental impacts such as leachate of pollutants from landfills and the resulting water and soil contamination
- Scale up of efficient waste management systems across India and stimulation of growth of waste sector
- Reduction of greenhouse gas emissions as compared to a business-as-usual scenario
- Creation of local employment opportunities for implementation of programme activities
- Reduction in other pollutants resulting from fossil fuel dependent power generation compared to a business-as-usual scenario
- Increase the share of renewable energy sources in the country
- Increase the efficiency and quantity of wastes collected and managed in a proper manner



Project Implementation



Country - India

All units/installations/facilities and other sites included within the project boundary as per the relevant methodologies will be within the territorial boundaries of India in the states (highlighted in black colour) shown above

Project Participants (PPs) will be various organisations in India working in the field of waste management.

Duration of the Project:

20 Years

Technologies/measures and eligibility under Gold Standard

Composting of organic wastes

Biogas for Thermal Applications

Bio-CNG for transport applications

Biogas for Electricity Generation

About the technologies

Composting

The PoA includes technologies that process the organic component of Municipal Solid Waste and convert it to compost, which is used for soil application thereby reducing the usage of synthetic fertilisers for the same. The compost produced is either handed over to local communities for use in their green areas, or packaged and sold for agricultural applications. The project comprises a number of decentralised composting units of varying capacities established at a community or household level. There is no co-composting of substrates under this project activity. The composting units or facilities vary in size and technology among VPAs. The size of the units varies depending on the requirement of the end user and can range from the completely decentralised (such as at a household level) to more centralised, larger units.



Biogas for thermal applications

The organic components of MSW are processed under anaerobic conditions in a biodigester, and the resulting methane is captured and used for thermal applications, such as cooking. There is no biomass utilised. The composition of the substrate (MSW) can vary among and between VPAs. In some instances, the substrate could be composed of MSW mixed with small quantities of animal wastes. The biogas produced is used for thermal applications in households, communities, institutions and commercial establishments. The biogas produced is either piped directly or bottled and distributed. The biogas produced replaces fossil fuels such as LPG or PNG that would have been used in the absence of the project.

Bio-CNG for Transport Applications

The organic component of MSW is processed at a centralised plant to produce biogas. The gas produced is purified to eliminate contaminants such as hydrogen sulphide, water and carbon dioxide, following which it is compressed. The purified gas contains around 95% methane. This is either bottled and supplied to vehicles, or is used at a filling station. The biogas produced replaces fossil fuels such as diesel or petrol, that would have been used in the absence of the project.

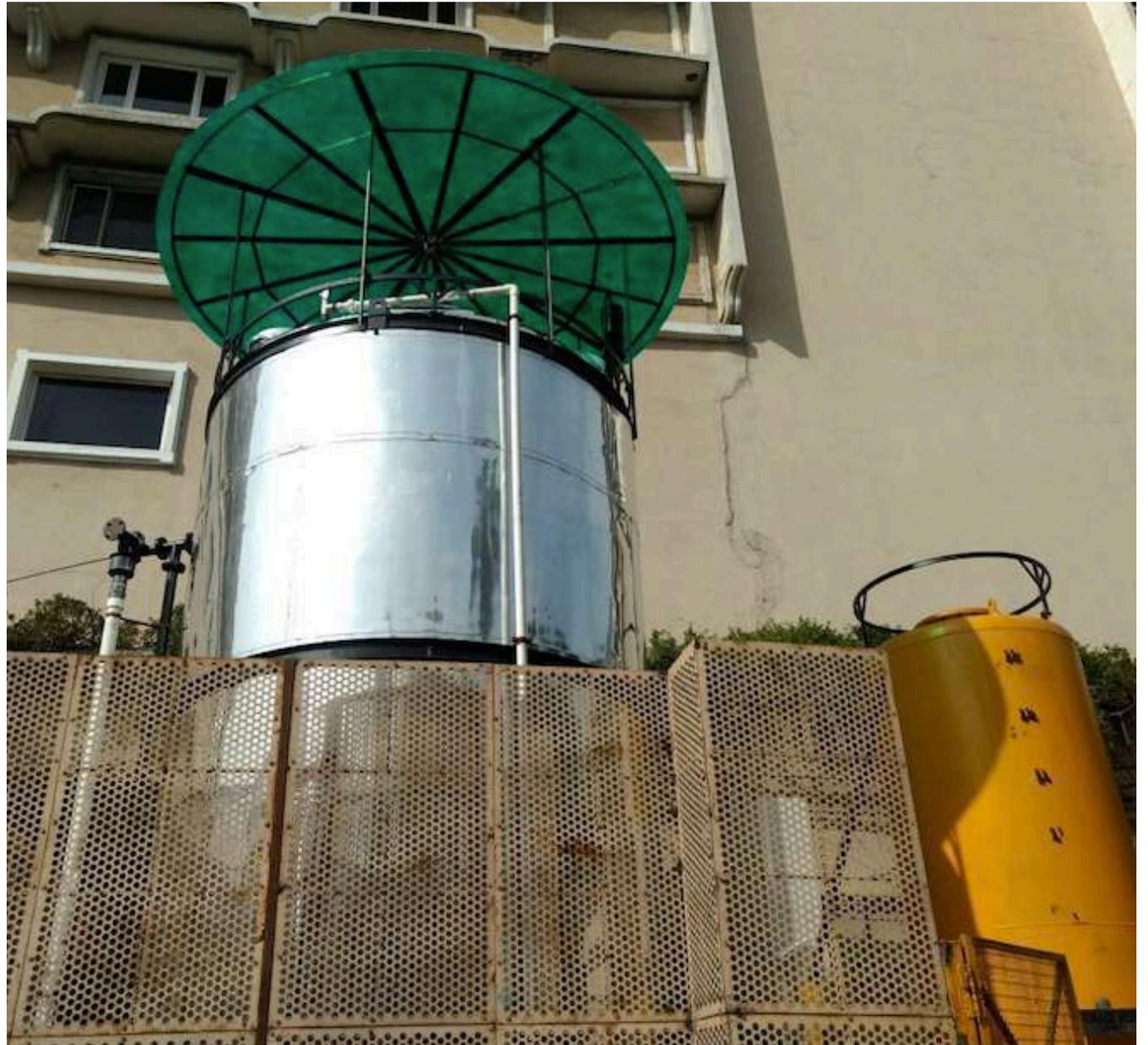
Biogas for Electricity Generation

The organic components of MSW are processed under anaerobic conditions in a biodigester, and the resulting methane is used for electricity generation. This does not include any hydro power plants. The composition of the substrate (MSW) can vary among and between VPAs. In some instances, the substrate could be composed of MSW mixed with small quantities of animal wastes. The biogas produced is used for electricity generation and captive consumption in communities, institutions and commercial establishments. The biogas produced replaces electricity from a regional or national grid that would have been used in the absence of the project.



Funding sources of PoA

The project is financed through revenue generated by sale of carbon credits as well as sources of private funding. The VPA implementer is a for-profit company registered in India and has some sources of funding which are confidential. Carbon revenue generated through project activity is used to scale up and expand the project activities.



Management System

Operational and Management Plan

- **Inclusion process of VPAs**
The VPA will be implemented by implementation partners who are all organisations working in the field of waste management.
- **Training and capacity development**
The VPA implementers are all organisations who are experienced in waste management. They provide their staff training and capacity building in order to undertake project implementation and monitoring activities.
- **A record keeping system for each technology or practice under the programme of activities (PoA)**
The VPA implementers maintain detailed records of all activities. The VPA implementer will provide monitoring data as required to the CME for the purpose of ER estimations and VPA monitoring.
- **A system/procedure to avoid double accounting**
E.g. to avoid the case of including a new VPA that has been already registered either as a project activity with GS or any other standard or as a VPA of another PoA.



Local stakeholder consultation

The Local Stakeholder Consultation is conducted at the PoA level. The goals and purpose of all VPAs are similar. The meeting is attended by stakeholders from across the PoA boundary and representation from a number of stakeholders covering the range of technologies to be employed in the PoA.

Stakeholders from the following relevant groups are identified and invited for the consultation,

1. Local people, communities and or representatives who are directly or indirectly affected by the project
2. Stakeholders with land-tenure rights within or adjacent to the project must be contacted
3. Local policy makers and representatives of local authorities
4. National government officials or National Focal bodies responsible for the project in the host country for example
5. Local non-governmental organisations (NGOs),

6. Women working Groups working on topics relevant to the project or working with communities who are likely to be affected by the project
7. A Gold Standard representative
8. Relevant international Gold Standard NGO Supporters with a representation in your region and all Gold Standard NGO Supporters located in the host country of the project



The Benefits



Reduction of greenhouse gas emissions as compared to a business-as-usual scenario



The recovered methane is processed and purified to ensure that the methane content of the upgraded biogas is in accordance with relevant national regulations



Creation of local employment opportunities for implementation of programme activities



Resource recovery from solid wastes resulting in less resource extraction and manufacture of new material



Reduction in other pollutants resulting from fossil fuel dependent power generation



Increase the share of renewable energy sources in the country



The project avoids disposal at an SWDS and is instead treated with an alternative option which is production and recovery of methane from MSW for transport application



Increase the efficiency and quantity of wastes collected and managed in a proper manner



The residual waste in this project is not disposed or prevented from disposal. The slurry/residual waste produced is used for soil and agriculture applications

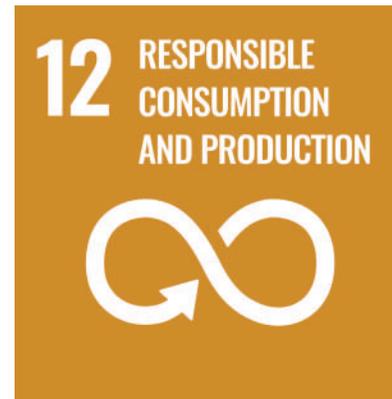


The project displaces grid electricity consumption and/or captive fossil fuel electricity generation at the user end



The Bio-CNG produced is utilised in CNG vehicles or modified vehicles

SDGs addressed by the project





VNV ADVISORY

VNV Advisory Services has been at the forefront of working with climate change and livelihoods. Our decade-long experience has seen us develop low-carbon projects that support these communities in getting their basic needs while adapting to and mitigating the harsh impacts of climate change. We work in areas of clean cooking, social forestry, sustainable agriculture, rural energy access and many other related community based technologies. With support from over 40 NGOs and implementation partners, our work encompasses over 4 million rural households and 50,000 hectares of forest areas under management across the South Asian (India, Bangladesh, Nepal, Laos, Myanmar and Sri Lanka) region. We have also been able to engage with businesses to address issues of Social Responsibility, Environmental Sustainability and Carbon Neutrality.





Contact

41/1, Reyyan Towers,
VNV Advisory,
Church Street,
Bangalore - 560001
+91 80 4242 9916/9933
contact@vnvadvisory.com

Value Network Ventures Advisory Services Pte. Ltd.
10 Anson Road, #29-07 International Plaza,
Singapore 079903

