Bioremediation of legacy waste in Deoguradia, Indore

Summary:

Bioremediation is an environment-friendly technique to separate soil and recyclables from the legacy waste. The process involves stimulating the growth of micro-organisms and degrading the target pollutants without the use of any toxic chemicals to alter the environmental conditions in the legacy waste dumpsites. (Patel , 2019)

Plastic, cloth, metal and wood among other solid waste recyclables were part of the legacy waste in Indore. The increasing amount of these combustible materials had turned into a health and environmental hazard, polluting the air by catching fire time and again. (Upadhyay, 2019).

Objectives:

- To bioremediate legacy waste dumps as well as existing operational dumpsite with approximately 15 lakh metric ton of garbage within a short time span of six months.
- To reclaim 100 Acre land of worth Rs.300 Cr and develop a green belt.
- To reduce Green House Gas Emissions, soil pollution and Ground water contamination.
- To increase nearby Real state value and benefit the citizens of Indore.
- To eliminate dump fires, leachate generation, foul odour from dumpsite.

Key Stakeholders:

- Indore Municipal Corporation (IMC)
- Indore Smart City Limited (ISCL)
- Ministry of Housing and Urban Affairs, Government of India
- Citizens of Indore
- Consultants

Implementation strategy:

- In compliance with the Solid Waste Management Rules, 2016; IMC bioremediated 100% legacy waste and reclaimed 100 acres of land worth Rs. 400 Cr (The Hindu, 2020).
- Deoguradia, the legacy waste dumpsite, was divided into suitable blocks and the quantity of the waste to be bio-remedied was determined based on contouring of area to be treated.
- A long spike harrow operating in cross directions was regularly used to pull out rags, plastic, rubber, textiles etc from the rake of garbage layer.
- Rotary and horizontal screens were used to screen the coarse garbage materials.
- The recyclables like plastic, metal, textiles and glass collected from the dumpsite were bundled to be sold, and the stones and ceramics recovered while screening and raking was sent for land filling of low-lying areas.
- The soil recovered was used to refill the on-site ground to develop green landscape.
- Construction and demolition (C&D) waste recovered was sent to C&D processing facility to produce building materials.
- For the execution of the work, the authorities deployed 10 trommels, 15 horizontal screens, more than 50 excavators, backhoe loaders, and 200 plus workers.
- Indore Smart City monitored the progress and tracked the on-site execution (National Institute of Urban Affairs , 2020).

Resource Utilization:

In 2018, IMC had outsourced the manpower for the reclamation work on a contract basis. However, outsourcing was identified as significantly slow and an expensive affair. The charges by the private contractor were around Rs 500 per cubic meter which would have cost the corporation approximately 65 Crores to clear the entire waste. This exceeded the Corporation's financial capacity and they decided not to outsource the work to some agency. IMC required many heavy machineries, and decided to take the trommels, screens, excavators, backhoe loaders on rent and operated by utilising their own resources. IMC operated this machinery in two shifts and completed the work in six months. The total expenses for the project were less than 10 Crores (Patel , 2019).

Impact/ Outcomes:

- Valuable 100 acres of land has been recovered by bio-remediation process, which is now being developed as a park for the citizens.
- The National Green Tribunal has advised ULBs in Okhla, Ghazipur and Bhalswa to use the Indore model to flatten the landfills and construct bio-diversity parks (Patel , 2019).
- Foul odour has disappeared completely and there is a considerable decline in diseases arising out of the trenching ground.
- Green House Gas Emissions, soil pollution and groundwater contamination has reduced, thereby increasing the real estate value nearby. (Patel , 2019), (National Institute of Urban Affairs , 2020)

Challenges/ Lessons Learnt:

- IT-based technical innovations and environment-friendly techniques in solid waste management can be an efficient practice to monitor and tackle the legacy waste.
- The key challenge faced for the successful implementation of the Waste to energy plant was outsourcing of the manpower on a contract basis leading to slowing down of the pace of the project (National Institute of Urban Affairs , 2020).

Replicability & Sustainability:

- Indore's successful model of dealing with huge quantities of legacy waste through bioremediation can be replicated in other cities across India.
- The project has inspired more than 20 ULBs to start bio-remediation projects.

Source: (Patel , 2019)

Fact Sheet:

Thematic area	Solid waste management
First-year of the program	2018-2019
Responsible institution	Indore Municipal Corporation
Target	Treat legacy waste
Coverage	Deoguradia, Indore