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CII- ENVIRONMENT BEST PRACTICES AWARD 2021

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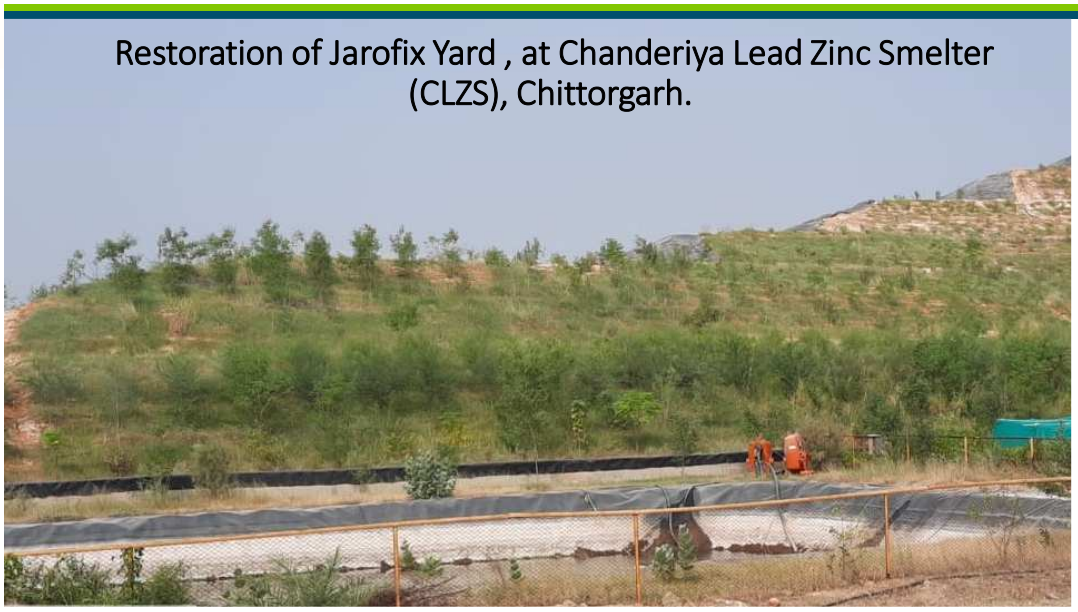
Restoration of Jarofix Yard , at Chanderiya Lead Zinc Smelter (CLZS), Chittorgarh.



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PROJECT DETAILS

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Title: Restoration of Jarofix Yard, at Chanderiya Lead Zinc Smelter (CLZS), Chittorgarh.

Trigger of the Project:

The Jarofix dumps occupied huge land parcels and lead to land degradation. For long term, sustainable and cost-effective reclamation of the Jarofix dumps and create lush green expanses in the area, mycorrhizal technology, developed by The Energy and Resource Institute (TERI), proved to be a great opportunity.

Uniqueness of the Project:

One of the BIGGEST examples of Greening Industrial Wastelands.

- By using mycorrhiza technology plant saplings are developed without fertile soil and optimum water consumption.
- Plantation of native species promotes Biodiversity.
- Does not require use of chemical fertilizers
- Green cover becomes self-sustainable in two years.

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JAROFIX DUMP

- Jarosite is the major waste generated from our Hydro metallurgical Zinc Smelter during its leaching process , this Jarosite waste is further stabilized as Jarofix after treatment with lime & cement and disposed in lined Jarofix Disposal Yard. It is capped by liners as per CPCB Guidelines.
- Mycorrhiza-based reclamation technologies developed by The Energy and Resources Institute (TERI) is used for expansion and improvement of cultivation processes used in greening, rejuvenation of previously fertile soils and reclamation of wasteland into productive land in a sustainable manner.
- The green belt covers around 3 hectares of the Jarofix dump with a vision to completely cover it.

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MYCORRHIZA TECHNOLOGY

Mycorrhiza, a fungi form biofertilizer that has an intimate, mutually beneficial relationship with plant roots. The plant makes organic molecules such as sugars by photosynthesis and supplies them to the fungus, and the fungus supplies to the plant water and mineral nutrients, such as phosphorus, taken from the soil.

According to research, it increases the absorbing area of the roots by hundred to thousand times and also makes unavailable and other tightly-bound soil-essential nutrients available to the plants, thereby facilitating the ability of the plants to utilize soil resources more efficiently.

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BRIEF PROCESS

- Germplasm of selected plant species were procured and tested on jarofix.
- Based on performance, mass production of selected plant species was carried out using standard techniques developed by TERI in nursery and mother bed at site.
- After attaining required growth, the plant were transferred for field plantation.
- Suitable plant species were selected and were planted in edapho climatic conditions on these dumps.
- Drip irrigation system was installed at site for field for regular water .
- Regular maintenance of the site.

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SAVINGS

100%

Waste land utilization

Overall increase in biodiversity Index

100%

Reduction of soil erosion and fugitive dust emission

60 Crores (capping cost 50 Cr+ 13 Cr Land Cost

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BENEFITS

- ✓ Developing alternative use of abandoned waste land
- ✓ Promotes biodiversity
- ✓ Developing alternative livelihood opportunities for surrounding community further leading to biologically reclaimed site
- ✓ Saving extra cost on capping the huge waste yard
- ✓ Stabilization of dump slopes
- ✓ Erosion control
- ✓ Arrests fugitive dust emissions
- ✓ This add to the overall aesthetic outlook of area along with increasing ecological foot print

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Replication potential, Progress & Spreading benefits of the Project

Basic idea: Restoration of disturbed land due to industrial activities

Replication Potential: Greening and rejuvenation of previously fertile soils and reclamation of wasteland into productive land in a sustainable manner using beneficial group of micro-organisms known as mycorrhizal fungi.

Implementation at HZL:

- Restoration of Jarofix Dump by developing a green cover over that area.

Spreading Benefits

- ➢ Utilization of wasteland
- ➢ Biodiversity enhancement in the surrounding environment
- ➢ Prevention of air pollution by arresting fugitive dust emission
- ➢ Erosion control

Before

After

CHALLENGES

Challenge	Root Cause	Solution
Provide uninterrupted water for irrigation and electricity	To ensure proper maintenance of the plantation activities and smooth greening activities	Drip Irrigation was provided/ Pipe lines set up from plant to pond.
Provide road network accessible in all seasons on the dump	There is requirement of movement of material as well as personnel daily on the dump.	At every step(5 mtr height) road network prepared
Providing adequate nutrients	Jarofix is highly alkaline, except for potassium, nitrogen and phosphorous are less.	After conducting proper soil testing and soil surveys, site specific mycorrhiza was developed and applied.
Control dust emissions	Once the HDPE liner is removed OR torn there is dust emissions due to wind.	Sprinkler system was used for dust suppression.
Securing the perimeter	Protection of plantation from the cattle and other animals	Concrete wall is available in periphery area of Jarofix yard

NATIONAL BENCHMARKS/STANDARDS

- It is one of the Best Low cost closure technology for restoration of Waste yard to green area.
- The project aligns with Vedanta's vision of continuous implementation of latest technology as well as the vision of sustainability in industry to reduces Environmental contamination.
- This is the first time in India, that Mycorrhiza technology is used on Jarofix dumps for greening the area.

BEST PRACTICE

- Land reclamation and utilization of waste as resource.
- This technology doesn't require the use of good earth from elsewhere or the use of chemical fertilizers.
- Optimum use of water resources.
- Mycorrhiza used can survive in extreme conditions of drought as well.
- Drip irrigation was provided for minimal water use
- Dump slope stabilization achieved by single brick lining along the road networks. It will be also supported by the vegetation.
- Fugitive dust emission control
- Native species were planted which were suitable for the site.
- To align plant production for maximum profitability, periodic planning and review sessions were conducted.

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MAJOR LEARNINGS FROM PROJECT IMPLEMENTATION

- Restoration of degraded land through a proper package of biotechnological practices could be the best permanent solution for problems associated with wastelands.
- Reducing Environmental Footprint (increased gainful utilization of waste, optimum water use) through this technology.
- Implementations of modern technologies which can run the business more efficiently without causing any harm to the environment .

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Thank You