



Steel Slag Road Technology

For Prelims: Steel Slag Road technology, Steel Slag, [Waste to Wealth mission](#)

For Mains: Steel Slag Road technology its significance in Waste to Wealth mission, Technological advancements in Road Infrastructure.

[Source: PIB](#)

Why in News?

The innovative **Steel Slag Road technology** developed by the [Central Road Research Institute \(CRRI\)](#), **New Delhi** in collaboration with the **Ministry of Steel** and major steel manufacturing companies is making significant strides towards the ['Waste to Wealth' mission](#).

- This technology is revolutionizing road construction and addressing the environmental challenges of steel slag waste.

What is Steel Slag Road Technology?

- **About:**
 - Steel slag road technology is a novel method of using steel slag, the **waste generated during steel production**, to build **more robust and more durable roads**.
 - The technology involves **processing the steel slag to remove impurities and metal content** and then using it as an **aggregate for road base or sub-base layers**.
 - The processed steel slag has **high strength, hardness, abrasion resistance, skid resistance, and drainage capacity**, making it suitable for road construction.
 - It facilitates the **large-scale utilization of waste steel slag** generated by steel plants, effectively managing the approximately **19 million tonnes of steel slag produced in India**.

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▪ Advantages:

◦ Eco-friendly Waste Utilization:

- By using waste steel slag in road construction, the technology offers an **eco-friendly approach to managing industrial waste**.
 - This reduces the burden on **landfills and minimizes the environmental impact** associated with steel slag disposal.

◦ Cost-effective and Durable:

- Steel slag roads have proven to be **cost-effective**, as they are approximately **30% cheaper to construct compared to conventional paving methods**.
 - Furthermore, these roads exhibit **exceptional durability and resist weather changes** resulting in significantly reduced maintenance costs.

◦ Reduced Reliance on Natural Resources:

- Traditional road construction heavily relies on **natural ballast and aggregates**, depleting precious natural resources.
- The Steel Slag Road technology eliminates the need for natural materials, helping **conserve valuable resources and preserve natural ecosystems**.

◦ Addressing the Steel Slag Waste Challenge:

- **India is the world's second-largest steel-producing country**, generating around **19 million tonnes of steel slag as solid waste**. This figure is projected to increase to a **staggering 60 million tonnes by 2030**, with each tonne of steel production **resulting in about 200 kg of steel slag waste**.
 - The lack of efficient disposal methods has led to the accumulation of huge slag piles around steel plants, contributing to water, air, and land pollution.

▪ Successful Implementations:

◦ Surat's Technological Marvel:

- The first road constructed using the Steel Slag Road technology in Surat, Gujarat, has garnered recognition for its technological excellence.

◦ Border Roads Organization's Contribution:

- The technology's success extended to the **India-China border**, where the **Border Roads Organization**, along with CRRI and Tata Steel, constructed a **steel slag road in Arunachal Pradesh**.
- This project demonstrated the technology's **suitability for challenging terrains and critical national infrastructure**.

▪ Promoting Nationwide Adoption:

- The success of the Steel Slag Road technology has attracted the attention of various government agencies and ministries.
 - In collaboration with the **Ministry of Science and Technology and the Ministry of Road Transport and Highways**, the Ministry of Steel is actively working to promote the widespread usage of this technology across the country.
 - By fostering collaborative efforts, India aims to lead the way in sustainable road infrastructure development and achieve its **'Waste to Wealth' mission**.

Waste to Wealth Mission

- This mission will identify, develop, and deploy technologies to treat waste to generate energy, recycle materials, and extract worth.
- The Waste to Wealth Mission is **one of the nine national missions** of the [Prime Minister's Science, Technology, and Innovation Advisory Council \(PM-STIAC\)](#).
- The mission will **assist and augment the Swachh Bharat and Smart Cities projects to create circular economic models** that are financially viable for waste management to streamline waste handling in the country.

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