GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH
LOK SABHA
UNSTARRED QUESTION NO. 4273
(ANSWERED ON 26.03.2025)

WASTE TO WEALTH TECHNOLOGIES

4273. Smt. Kamaljeet Sehrawat:

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether Council of Scientific and Industrial Research (CSIR) has taken steps to encourage research and development of Waste to Wealth Technologies to value add the concept of Circular Economy; and

(b) if so, the details thereof and if not, the reasons therefor?

ANSWER

MINISTER OF STATE (INDEPENDENT CHARGE) FOR THE MINISTRY OF SCIENCE AND TECHNOLOGY AND EARTH SCIENCES

(DR. JITENDRA SINGH)

(a)&(b) Yes, Sir. Council of Scientific and Industrial Research (CSIR) has implemented a mission mode project on 'Waste to Wealth: Comprehensive Solutions Towards Circular Economy and Sustainability' in FY 2023-24 with a budget of Rs.6662.772 lakh for the duration of three years. The project aims to address a broad spectrum of industrial and critical waste management challenges, encompassing fossil fuel waste, biotic waste, metallic and non-metallic waste, and electronic waste. It seeks to tackle complex waste management issues through innovative approaches and transform waste into valuable resources through industry collaboration. This mission-mode initiative is structured into three primary work packages: "Value Addition and Utilization of Industrial Waste," "Recycling of E-Waste and Extraction of Valuable Materials," and "Conversion of Biomass and Fossil Fuel Waste into Valuables and Energy." The research activities within this mission encompass distinct technology project components,

and 19 CSIR laboratories are involved in the execution of the mission's objectives.

Under this mission, waste from various sectors has been collected, and the development of processes and technologies is progressing at different stages. Significant achievements under the mission are as under:

- **Utilization of Fired Stoneware Crockery Waste in Stoneware Products: A process has been developed to incorporate fired stoneware crockery waste into stoneware products. A total of 100 samples, tailored to a specific composition, have been successfully produced at an industrial scale.**
- **Recycling of Construction & Demolition (C&D) Waste into Glass Foam Bricks: Glass foam bricks, measuring 235x110x70 mm, have been successfully produced from recycled C&D waste. These bricks exhibit a compressive strength of approximately 4 MPa, offering a sustainable alternative to conventional building materials.**
- **Refractory Waste Recycling for High-Temperature Applications: A prototype has been developed for utilizing recycled refractory materials in high-temperature applications. The composition incorporates up to 40% recycled refractory content, showing promising results in terms of performance and sustainability.**
- **Mechanical Separator for Efficient Solar PV Module Disassembly: A robust mechanical separator has been designed and developed to facilitate the efficient disassembly of solar photovoltaic (PV) modules, supporting enhanced recycling and sustainability in the solar energy sector.**
- **Organic Acid-Based Method for Extracting and Converting Orange Peel Flavonoids and Pectin: A novel organic acid-based method has been developed at the laboratory scale for the simultaneous extraction of flavonoids and pectin from orange peel, followed by bio-nano conversion, offering potential for value-added products in food and pharmaceuticals.**
- **Bulk Utilization of Fly Ash for Synthetic Aggregate Production: A technology has been established for the bulk utilization of fly ash in the production of synthetic fine and coarse aggregates, which can replace conventional natural aggregates in construction, promoting sustainability and reducing the environmental impact of traditional aggregate production.**

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