**Problem Statement-6**

**Title of the Problem Statement**: Indigenous Development of Suitable Pastefill Material for Use in Underground (UG) and Highwall Mining

**Issues:**

Pastefill is a crucial backfilling material used in underground mining to maintain the structural integrity of mines by filling large voids left after final coal extraction. It prevents the collapse of mine roofs and sides, ensuring the safety of miners and the long-term stability of mining operations. By creating a solid mass from tailings, binders, and water, pastefill stabilizes the underground environment and allows for the safe extraction of multiple coal seams, particularly in deep mining where stresses are higher and exist thick surface features.

However, conventional pastefill methods may not be suitable for all local mining conditions, as each site has unique geological characteristics that require tailored solutions. The composition of tailings, availability of binding agents, and specific mine conditions all influence the effectiveness of pastefill. Thus, developing various types of indigenous pastefill material designed for local contexts is crucial. In highwall mining, where coal is extracted from steep inclines, pastefill also plays a key role in preventing subsidence and ensuring stability. As the mining industry evolves, the development of specialized pastefill materials will be essential for ensuring safety, sustainability, and efficiency in mining operations.

**Expected Outcomes:**

* A well-researched and tested indigenous pastefill material suitable for UG and highwall mining.
* A reduction in operational costs for mining companies through the use of locally sourced materials.
* Enhanced safety and stability in mining operations, with reduced environmental impact.
* Creation of a sustainable and replicable model for pastefill development that can be adopted across various mining operations in India and potentially other regions with similar mining practices.

**Mentor:**

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