Conservation of Mineral Resources

A *mineral* is a naturally occurring chemical compound, usually of crystalline form and abiogenic in origin. A mineral has one specific chemical composition, whereas a *rock* can be an aggregate of different minerals or *mineraloids*. The study of minerals is called *mineralogy*.

Mineral deposits **can be classified as:**

- ***Mineral resources*** **that are potentially valuable, and for which reasonable prospects exist for eventual economic extraction.**
- ***Mineral reserves*** **or *Ore reserves*** **that are valuable *and* legally and economically and technically feasible to extract**

Mineral Resources

A ***'Mineral Resource'*** is a concentration or occurrence of material of intrinsic economic interest in or on the earth's crust in such form, quality and quantity that there are reasonable prospects for eventual economic extraction. ***Mineral Resources*** are further sub-divided, in order of increasing geological confidence, into ***inferred, Indicated*** and ***measured*** Categories.

Inferred Mineral Resource is the part of a mineral resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological or grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes which may be of limited or uncertain quality and reliability.

Indicated Mineral Resources are simply economic mineral occurrences that have been sampled (from locations such as outcrops, trenches, pits and drillholes) to a point where an estimate has been made, at a reasonable level of confidence, of their contained metal, grade, tonnage, shape, densities, physical characteristics.

Measured Mineral Resources are indicated resources that have undergone enough further sampling that a 'competent person' (defined by the norms of the relevant mining code; usually a geologist) has declared them to be an acceptable estimate, at a high degree of confidence, of the grade, tonnage, shape, densities, physical characteristics and mineral content of the mineral occurrence.

Mineral Reserves and Ore Reserves

Mineral reserves **are resources known to be economically feasible for extraction. Reserves are either** ***Probable Reserves*** **or** ***Proved Reserves*****.**

A ***Probable Ore Reserve*** **is the part of** ***indicated*****, and in some circumstances,** ***measured*** **mineral resources that can be mined in an economically viable fashion. It includes diluting material and allowances for losses which may occur when the material is mined. A** ***Probable Ore Reserve*** **has a lower level of confidence than a** ***Proved Ore Reserve*** **but is of sufficient quality to serve as the basis for decision on the development of deposit.**

A ***Proved Ore Reserve*** **is the part of** ***measured*** **resources that can be mined in an economically viable fashion. It includes diluting materials and allowances for losses which occur when the material is mined.**

A ***Proved Ore Reserve*** **represents the highest confidence category of reserve estimate. The style of mineralization or other factors could mean that** ***Proved Ore Reserves*** **are not achievable in some deposits.**

Conversion of Resources into Reserves

- Mining and geological factors
- Metallurgical factors
- Economic factors
- Environmental factors
- Marketing factors
- Legal factors
- Political factors
- Social factors

Needs

- **Minerals are formed by inorganic processes of long duration.**
- **Minerals are exhaustible and non-renewable resources.**
- **Extraction of minerals has increased at large scale to meeting the ever increasing population.**
- **The total volume of consumable mineral resources is just 1% of all the minerals present in the earth's crust.**
- **The extraction and consumption rate is so high that these mineral resources will get exhausted very soon.**
- **The depletion of mineral resources also increases the cost of minerals as extraction is done from great depth and the quality of the minerals also goes down.**
- **Due to improper and excessive use, minerals in certain regions are on the verge of extinction.**

Hence, there is a need of *conservation of minerals.*

Suitable Measures

- Control population growth to reduce demand for minerals
- Create social awareness regarding conservation of minerals
- Reuse and recycle minerals
- Use of alternative renewable substitutes
- Avoid use and acceptance of minerals which are not essential
- Improve technology to use the low grade ores profitably
- Use minerals in a planned and sustainable manner

Conservation of Mineral Resources

Ministry of Mines
Government of India

As per *National Mineral Policy 2008*, conservation of mineral shall be construed not in the restrictive sense of abstinence from consumption or preservation for use in the distant future but as a positive concept leading to augmentation of reserve base through *improvement in mining methods*, *beneficiation and utilisation of low grade ore* and *rejects and recovery of associated minerals*. The Government is aiming for an adequate and effective legal and institutional framework *mandating zero waste mining* as the ultimate goal and a commitment to *prevent sub-optimal and unscientific mining*. Mineral Sectoral value addition through latest technique of *beneficiation, calibration, blending, sizing, concentration, pelletisation, purification* and *general customising* of product is being encouraged.

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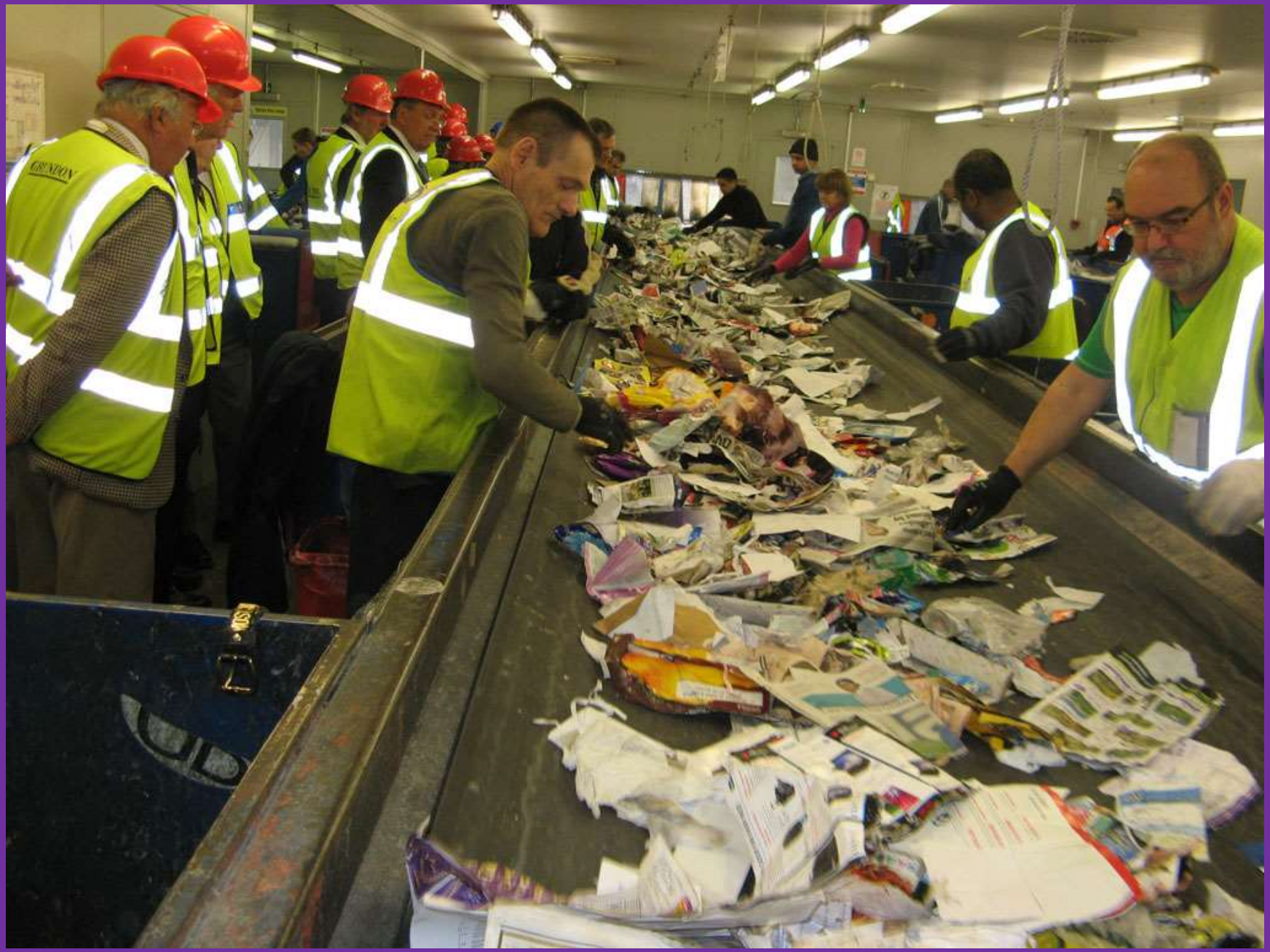

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THANK YOU

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