

THE NATURAL RESOURCES HIERARCHY WITH RESPECT TO SUSTAINABLE DEVELOPMENT.

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Since the end of World War II mankind has consumed more natural resources than in its entire previous history. To meet the demand of future generations for natural resources, the efficiency with which natural resources are used has to be improved. This efficiency is normally calculated by dividing the gross national product by the total natural resources consumed or vice versa. The types of resources, however, are not taken into account. It is proposed to improve this concept by taking into account the resources hierarchy with respect to sustainable development. The top of the hierarchy is occupied by the most valuable resources, i. e. the energy resources. These are followed downwards by those mineral resources whose deposits are created by natural enrichment, e. g. the metalliferous deposits. The next level down consists of resources like construction raw materials whose availability is, from the geological point of view, unlimited in the Earth's crust and those resources, such as magnesium, that are present in practically unlimited quantities in the oceans. At the base of the hierarchy are the waste products and residues from beneficiating or firing the higher-value resources. Higher-value resources should always be substituted by lower-value resources. The aim of mineral resources policy in the sense of sustainable development must be to utilise, where possible, the resources at the base of the hierarchy to save resources at the top. This may be achieved for example by means of a materials-flow law maximising the utilisation of waste products and minimising the disposal of waste or by optimal regional policies permitting unimpeded access to bulk mineral resources. Consideration of tonnages alone is not a helpful exercise in this context.