

→ Bauxite mining and rehabilitation

Bauxite is the most important raw material in the production of high-grade aluminium products. About 120 million tonnes of the ore are extracted annually, mostly in open-cast mines. The most important mining areas are in countries in the tropical belt such as Australia, Guinea, Jamaica and Brazil. Even when viewed from today's perspective, the known, commercially-viable bauxite reserves will last for more than 200 years.



Recultivated land in Bitan, Indonesia (LHS: Source: RWTH Aachen, Forschungsinstitut für Internationale Technische und Wirtschaftliche Zusammenarbeit) and Weipa, Australia (RHS: Source: [1])



Rehabilitation is an integral part of bauxite mining. Appropriate measures for the desired type of recultivation and secondary use are taken long before

the actual ore is extracted. This involves the following steps:

- careful removal of vegetation
- collection of seeds
- systematic removal of top soil and overburden
- temporary storage of the top layers.

Only once these steps have been completed can the bauxite be mined. There are a number of final steps that are also an integral part of "bauxite mining", such as

- adaptation of the site to the landscape and the spreading of the temporarily stored over-burden and top soil over the whole area
- planting the seeds (covering with vegetation).

This is essential for efficient rehabilitation. About 80 percent of the bauxite mining area is returned to its original vegetation in this way (Fig. 1) and a further 18 percent is developed for forestry and agricultural purposes (Fig. 2). The remaining two percent is used for recreational or industrial applications and contributes to the social and economic development of the area.

Bauxite mining is accompanied by continuous environmental monitoring, which includes erosion control and water and waste management. Moreover, the mine operators have their own nurseries for plants and trees, which enable different types of plants and saplings to be grown (Fig. 3).

If, for example, one wants to put the mining area to agricultural use, research projects are carried out to test and optimise the yield of fruit trees or grasses under the specific geographic conditions (Fig. 3).

Only six percent of the bauxite produced worldwide is mined in rain forest regions. For this an area of 2,4 square kilometres is used annually which is



Rehabilitation of the mined areas for agriculture and cattle breeding, Jamaica [2]



equivalent to 0,00002 percentage of the entire rain forest. In these areas one mostly tries to achieve a form of rehabilitation that is as close as possible to the original eco-system. Even if there is rehabilitation for agricultural or forestry purposes, this can contribute indirectly to rain forest conservation. Destruction of the tropical rain forests is almost exclusively attributable to nomadic farming including fire clearing by the poorest classes of society, for whom this is the only way of earning a living [4]. The provision of land or forest acreage under cultivation can thus reduce fire clearing elsewhere.

In 1990 the United Nations awarded its "Global 500 Roll of Honour for Environmental Achievement" prize to a bauxite mine in Western Australia for exemplary rehabilitation.

Rehabilitation means that bauxite mining is a form of temporary land use [5]. On completion of the mining operations, the mined area is returned to a form suitable for further use. In the context of sustainable development, this conforms with the surrounding landscape from ecological, economic and social points of view.



LHS: Tree nursery in Porto Trombetas, Amazonas, Brazil – about 450,000 saplings are produced annually [3];
RHS: Test fields of possible grasses for agricultural use, Jamaica [2]



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