

Methodological framework for ensuring the sustainable supply of raw materials in the ceramic cluster of Santa Gertrudes, SP, Brazil

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As regards to future prospects of the ceramic industry, one of the major challenges for continuity of its activities on a sustainable basis is ensuring the supply of qualified raw materials.

Among the factors that affect the future availability of these raw materials there are uncertainties regarding the depletion of important mineral deposits, some of them providing ores for export to clusters abroad in Europe and Asia.

Brazil is an important player in the global market of ceramic tiles, corresponding to the second largest global producer and consumer of these ceramic materials, being surpassed only by the Chinese market. Pushing the Brazilian production, the Santa Gertrudes cluster produced 536 million m² of ceramic tiles in 2012 which represented 62% of the Brazilian overall production. The lower production costs in this cluster as compared to other similar national and international clusters correspond to its main competitive advantage. These lower costs are related to the use of highly qualified clays produced locally.

Presently several restrictive situations have been interfering in the availability of new areas for clay mining in the Santa Gertrudes cluster. One restriction relates to environmental the creation of protected landscape which interferes with the availability of mineral resources. In addition, there are some other economic activities

that spatially compete with the production of raw ceramic materials, such as urban sprawl, agriculture, and the exploitation of water resources.

Thus, the depletion of easily accessible reserves, the increasing environmental constraints, and conflicts over land uses tend to reduce the availability of mineral reserves, this way posing uncertainties to the supply of raw materials and competitiveness of the Brazilian ceramic industry.

This study proposes a methodology for planning and managing the production of mineral inputs, in such a way to ensure that mining of ceramic raw materials for the Santa Gertrudes cluster will not conflict with other economic activities or environmental conservation practices. The outcome is expected to be a model for spatial planning encompassing the physical, biotic and other natural endowment of the geographic region in which this cluster is located.

As a methodological approach, a crossed analysis of the availability of mineral resources as compared to the ongoing mineral production, taking the present socioeconomic and environmental conditions of the region of Santa Gertrudes as a reference, was performed. This analysis was based on some weighting parameters considered strategic for the sustainable development of mining in the cluster area. These parameters identified relevant factors to be considered for the establishment of a mining master plan. Among these factors are the partitioning of areas appropriate to mining and the writing of managerial guidelines for the improvement of the ceramic activity in the cluster area.

The resulting database, maps and reports are expected to aim the decision making process of both public and private agents playing a role in the ceramic mining sector. The effective use of these technical products will enable land use planning, the technological advancement of mining, and also a better environmental control of the Santa Gertrudes cluster in a regional level.