

Environmental map of Cambodia to realize sustainable development of small-scale mining sector

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In Cambodia, all of the gold is produced by the small-scale mining sector and the transformation of the sector into sustainable/environmentally sound industry is one of the pressing needs of the nation. GIS seems to be the powerful tool both in environmental protection and in mineral exploration and the authors applied the technology in order to make a small-scaled management map of the environment. Our overlay of several layers including the information of gold metallogeny, drainage pattern and census data showed that some areas are vulnerable for the contamination arising from primitive technology of gold mining. This presentation will show the database used to make the map and the final result that will be utilized for the environmental management.

Recent gold production in Cambodia owes to the small-scale mining sector where miners use primitive technology of mining, dressing and smelting. This fact leads the country to the effort in finding methods to transform the sector into sustainable and profitable business urgently. Before, mercury was most important material to extract gold from ore, and the place by place contamination still exists within the nation, although they do not use mercury but cyanide these days. Environmental management of local area and technological assistance for the miners are important activities to convert the small-scale mining into environmentally sound (i.e., sustainable) industry. In order to make a plan to protect the environment and to better manage mineral resources, the government officers need visual materials which assist them in policy-making process. Especially it is necessary for them to predict on a map the future target of mining, and the distribution of miners when the gold price soars. Since geology is a science of time scale, it seems to be a core knowledge for the prediction. Based on the hypothesis the authors made an environmental map using geologic and metallogenic maps. For the work, the geographical information system (GIS) was utilized to extract gold potential zones. Geological information and metallogenic/mining information were overlaid, and the gold potential zones were identified. The each of the identified zones were classified into three categories. After this procedure, topographic map was overlaid and the drainage pattern was carefully examined. Then distribution of big towns, distribution of minorities, their habit, nationwide population, and trading routes were examined. Processing method was another factor to be considered. All of the information mentioned above were used to roughly assess the environmental risk of each gold potential zone. Finally the map showing the gold potential was converted into the environmental management map which shows vulnerable areas for the environmental damage.