

## ENVIRONMENTAL CHANGES THAT MAY OCCUR ON THE YOGYAKARTA SAND BEACH CAUSED BY THE IRON MINING

**M Nurcholis\***

Faculty of Agriculture, UPN “Veteran” Yogyakarta, Indonesia

\*Corresponding author: nurcholis@upnyk.ac.id

### **Abstract**

There is a plan to mine and extract the metallic minerals from the sand beach in Yogyakarta, Java Island, Indonesia. The existing utilization of the land is as agriculture that done by local farmers for more than two decades. It is predicted that the environmental changes may occur over the mining and processing of the iron sand material in this area. The tailings produced would be characterized as fine size, low density and still remaining metallic minerals. As wind blows from the sea every time towards terrestrial may fly the light tailing materials in higher elevation and more far range, thus it potentially endanger the broader area where people live.

### **Introduction**

The south coast land of Yogyakarta region, Java Island, Indonesia developed on the combination processes of the transported the Merapi volcano materials on the south coast, ocean waves and monsoon wind resulting deflation process the grains of sand towards the shore (Prastitho and Nurcholis, 2000). The sorting process on this material by wave force that occur in long period produces an accumulation of metallic minerals with a high density, such as: magnetite, hematite, ilmenite, vanadinite, zircon, titanite and rutile, that have a high economic value if these will be mined. On the other hand, people in this area have managed the land that has very poor nutrient but good physical properties and excellent beaches climate to be productive agriculture land. According to a mining activity that would be planned in this area, this study was aimed to predict environmental changes that may occur over the mining and processing of the iron sand material.

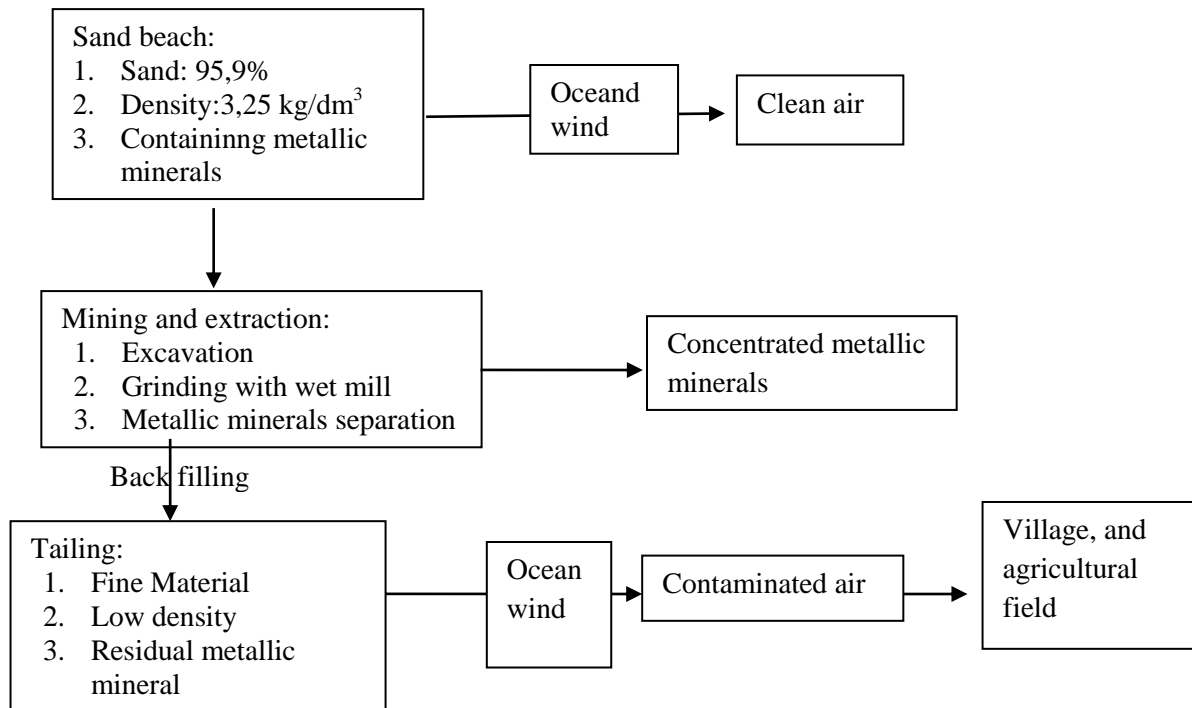
### **Materials and Methods**

The study was conducted by field observations on the coast of the planned mining, and detail study was conducted on the location of the pilot plant to understand the environment area after mining activity. Minerals and elements content in the tailing resulted from the pilot plant were then analyzed.

### **Results and Discussion**

Most of the coast land area was cultivated with many kinds of crops by the farmers that live on the north of this area. They manipulated the soil developed on the sand dunes which characterized with coarse materials (Sukirno, 2008) by adding the clay and organic materials in order to create a good condition for plant growth. The similar effort was also done by the farmers in Thailand farmer (Wada, 2005) and in Hainan China (Zhao et al., 2005).

Mine activity would be done by excavating the sand until three meters in depth, then it would be processed at the site, and the tailings would be returned back as a material for reclamation process (Figure 1). In order to maximize the extraction process, the sand would be performed by grinding previously before iron minerals separation that would be done by providing a magnetic field. Then separation of the remaining metallic minerals would be done by the difference of each mineral density, respectively. So that the tailings produced would be characterized as fine size, low density and still remaining metallic minerals. As wind blows from the sea every time towards terrestrial may fly the light tailing materials in higher elevation and more far range, thus it potentially endanger the broader area where people live.



**Figure 1.** Metallic minerals separation on the Iron sand and the effect on the environment

### Conclusion

Mining operation that will be done on the iron sand beach in Yogyakarta might cause the flying of the fine tailing materials. It potentially result environmental problem on the populated area that located on the north area of mining land.

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