

STUDY ON EFFECTS OF THE COVER LAYER BY USING COAL ASH ON REVEGETATION IN INDONESIAN OPEN CUT COAL MINE

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ABSTRACT

Indonesia is one of the most important coal suppliers for Japan since approximately 20% of coal is imported from Indonesia. Almost all of the coal is produced by open cast coal mine in Indonesia; however, mining operation in open cast coal mine leads to negative effect on surrounding environment. Acid mine drainage (AMD) is one of the serious impacts of open cast coal mine. AMD is caused by supply of oxygen and water to sulfide minerals (mainly pyrite) as a result of mining activity. As a countermeasure for AMD, a dry cover system is widely applied in Indonesian open cast coal mine. In this system, waste rock is classified as Potentially Acid Forming (PAF) and Non Acid Forming (NAF) by geochemical test: PAF is the source of AMD and NAF is not. PAF is covered with NAF so as not to contact with oxygen and water to prevent AMD in this system. On the other hand, energy demand has increased and new coal-fired power plants have been constructed due to high rates of the economic growth in recent years in Indonesia. These trends cause generation of a large amount of coal ash which is industrial waste; thereby, it is necessary to increase the effective utilization of coal ash with the aim of processing the large amount of coal ash. Based on this background, coal ash was applied to a cover layer in the past research. However, it is concerned that the plant growth is affected by soil mixed with coal ash during revegetation since the cover layer is constructed near the surface and coal ash composed of various metals which affect plant growth. Therefore, this paper discussed the effect of coal ash on the plant growth by means of several laboratory tests and laboratory vegetation test with *Acacia mangium*. As the results of the discussions, the coal ash can be utilized as cover layer by mixing with soil at a proper rate from the view point of revegetation without effects on plants.

KEYWORDS: Coal Ash, Acacia Mangium, Revegetation, AMD, Dry Cover System