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AHP APPLICATION FOR EVALUATION OF EMISSION IMPACT MITIGATION MEASURES FOR COMMUNITIES NEAR LIGNITE-FIRED POWER PLANT AT MAE MOH, THAILAND

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Abstract

A coal-fired steam power plant, located near an open pit coal mine in Mae Moh, Lampang, a province in the north of Thailand, has been in operation since 1978, with a generating capacity of 2,400 megawatts, and lignite consumption of 40,000 tons/day. A maximum hourly concentration of SO_2 of 3,418 $\mu g/m^3$ was measured and an emission of 150 tons/hour of SO_2 from the power plant was estimated. In order to mitigate the impacts of the emission on human health, crops and livestock, several measures have been implemented, such as (1) installation of flue gas desulphurization units (FGD), (2) remote monitoring stations, (3) corporate social responsibility (CSR) programs, and (4) community development fund. Nevertheless, there have still been complaints about the emission from the power plant and resistance to the operation of the plant. The objective of the study is to find out the preferred measures of the people who are directly exposed to the adverse effects of the pollution.

A survey was conducted in the area to interview the local villagers for their preferences among the four (4) measures with an inclusion of cessation of the plant as the fifth options. Fifty five (55) respondents who live in the vicinity of the power plant were asked to provide pair-wise comparison of their preferences of the five (5) alternatives based on four (4) different criteria as (A) job opportunity, (B) agricultural concern, (C) health improvement, and (D) public acceptability. Analytical hierarchy process (AHP) was applied to evaluate the results from the survey. The survey results show that health and income are the most important criteria. The community development fund is the most preferred alternative, while cessation of the power plant is the last option.

Key words: analytic hierarchy process, emission mitigation, Mae Moh coal-fired power plant

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