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Alternative model for electricity and water supply after disaster

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Abstract

Disasters can have adverse effect on human lives. Access to electricity and safe water supply cannot be over-emphasized in the aftermath of a disaster. The main objective of this paper is to examine an alternative to electricity and water supply for human use during and after a disaster. According to this model, volcanic lake can be used as a dam reservoir as a proactive measure before disaster while a micro-hydropower can be set up for electricity production and its water can serve the population in emergency situations.

This paper demonstrates that the proposed method proffers a better solution compared to the conventional dams and energy generating plants which are usually destroyed during disaster. In addition to the maximization of water and electrical service coverage, the objective of this model includes the minimization of expected and worst-case losses. The proposed model (Natural Storage Based) can be applied to the Gölcük Crater Lake in Isparta, Turkey and other similar areas with the same geomorphology worldwide. The region was stricken by one of the most destructive earthquakes registered in ancient time.

Keywords: disaster; electricity supply; water supply; hydropower; natural storage based model

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