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Are large-scale dams environmentally detrimental? Life-cycle environmental consequences of mega-hydropower plants in Myanmar (Article) (Open Access)

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Abstract

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Purpose: Rivers control biophysical processes that underpin essential ecosystem services. Myanmar's rivers provide great opportunities for increasing energy supply at low costs from hydropower plants and make important contributions to the national economy. However, associated environmental impacts, as well as input and output flows of hydropower developments, remain less well understood. In this paper, we report on an investigation of the overall environmental effects of five hydropower plants in Myanmar, using a life-cycle impact assessment (LCIA) approach. The primary objective of the paper is to generate detailed life-cycle inventory data and quantify the environmental impacts of the existing five hydropower plants in Myanmar. **Material and method:** This paper reports on a “cradle to grave” LCIA for five hydropower plants in which environmental impacts associated with construction, operation and maintenance, transportation, and decommissioning of large-scale hydropower plants in Myanmar were systematically assessed. **Results:** Construction, transportation, operation and maintenance phases are most sensitive to global warming, mineral resource depletion, acidification, freshwater aquatic ecotoxicity, human toxicity and photochemical ozone creation. There is heterogeneity in hydropower plants' effects on the environment, based on the size of the power plant. **Conclusion:** Strategic selection of hydropower projects is suggested to enhance resilience in environmentally sensitive areas. It is concluded that more comprehensive and rigorous environmental and social impact assessment (ESIA) is needed, not only for mega-dams but also for the smaller-scale hydropower plants. [Figure not available: see fulltext.]. © 2020, Springer-Verlag GmbH Germany, part of Springer Nature.

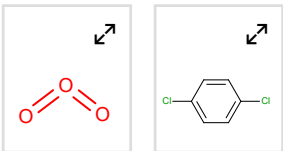
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