

## **EMISSION OF GREEN HOUSE GASES FROM HYDROPOWER PROJECTS - A REVIEW**

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### **ABSTRACT**

Hydro-power generation follows a simple concept: water falling under the force of gravity turns the blades of a turbine, which is connected to a generator. The rotating generator produces electricity. As a dam holds back water in its reservoir, the water level rises creating a reservoir of potential power. When this reservoir is filled up, certain area behind the dam is submerged. The extent of submergence depends upon the height of the dam and the topography of the region. Typically the dams are built in mountains and the submerged area may contain forest, plants, soil, and dead organic material like leaves, twigs, etc. Anaerobic decomposition of organic matter in the reservoir produces greenhouse gases (GHGs). Carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) are the major greenhouse gases. These gases are emitted from natural and manmade aquatic ecosystems (e.g., rivers, lakes, reservoirs, wetlands) and terrestrial ecosystems (e.g., forests, soils).

Recently, there are concerns that the hydropower reservoirs emit large quantities of GHGs, at times exceeding that from a thermal power plant of similar capacity. There are also discussions and arguments negating this view. Views have also been expressed that the reservoirs in the tropics emit much higher quantity of GHGs compared to those in the boreal regions. This paper reviews the current literature concerning emission of GHGs from hydropower reservoirs. It also suggests actions that need to be initiated in India to estimate the extent of the problem.