Effect of an Impoundment on Nutrient Dynamics in the Kihansi River, Tanzania

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Abstract

The impact of the Kihansi Dam on electrical conductivity, pH, temperature and dissolved oxygen in the Kihansi River was assessed in 2005 after 85% of the original river flow had been diverted to the Lower Kihansi power plant. The results are compared with the data obtained in 1995 before the dam was constructed. Primary production and nitrogen and phosphorus concentrations from sites upstream and downstream of the dam as well as in the reservoir were compared. Phosphorus fractions were determined in the reservoir's sediment. Electrical conductivity and pH values were higher in 2005 than in 1995, whereas oxygen concentrations were lower. Primary production, nitrogen and phosphorus concentrations were lower at stations downstream of the dam than at upstream stations. High fractions of iron- and manganese-bound phosphorus in the reservoir sediment suggest a potential for phosphorus retention. Concentrations of nitrogen and phosphorus along the Kihansi River were higher during the dry season than in the wet season. These results contribute to the documented baseline data on environmental changes in tropical river systems after flow diversion and reservoir development.

Keywords

Environmental Impacts; Hydropower Plants; Nitrogen; Phosphorus; Reservoirs; Sediments; Tropical Rivers