# Prospects for minimizing the potential environmental impacts of the hydro-agricultural dam of M'Bahiakro (Central Côte d'Ivoire)

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## Abstract

This study aims at characterizing the physical environment and suggesting solutions for a better management of the hydro-agricultural dam of M'Bahiakro which is being constructed over the N'Zi River and is the first inflatable dam of Côte d'Ivoire.

In this survey, data related to hydrology, characteristics of the dam and the irrigated rice production area were obtained with the Water Resources Agency and the National Office of Rice Development of Côte d'Ivoire. Physicochemical parameters of the N'Zi River were collected seasonally at three monitoring stations.

Results showed that the N'Zi River is characterized by a high water level from April to November and a dry period from November to April. The gap between the low flows and the high flows is important (about 206 $m^3/s$ on average). The annual average flow is about 40 $m^3/s$ with a standard deviation of 32.52 $m^3/s$ and a variation coefficient of 0.88.

The Physicochemical parameters do not present significant difference along the river. But the seasonal variations are important. The SAR average value (1.63) and the average conductivity (78.44 µS/cm) showed that waters of the N'Zi River are of high quality to be used for irrigation. Suspended sediment concentrations are higher during the rainy seasons (45.8 mg/L on average) than in the dry seasons (17.7 mg/L on average). The annual solid flux of the N'Zi River is about 41897 tons, and makes 15810 $m^3$ of sediments.

Great efforts concerning interdisciplinary approaches, as well as extensive and intensive field work are needed in order to better manage the hydro-agricultural dam of M'Bahiakro.

**Keywords:** inflatable dam, hydrology, suspended sediment, irrigation, N'Zi River, M'Bahiakro