

Anthropogenic Controls on the Lower-Suriname River, Suriname

Kathleen S. Gersie

Anton de Kom University of Suriname, Suriname, South America

Abstract

The Suriname River is the most important river of Suriname, because of its multifunctional character. Both the capital city, Paramaribo, and the most important harbour are located on this river. The catchment area is for the major part covered by dense tropical vegetation. The river is ~480 km long with its source in the hilly landscape of the Precambrian Guiana Shield between the Wilhelmina Mountains and the Eilerts de Haan Mountains, where it is known as the Gran Rio and the Pikin Rio (both of which are tributaries). In these mountains, river gradient is determined by the many rapids called soelas in places where harder rocks crop out. As a result, stream capacity is low with little sediment transport. The lower course of the Suriname River is related to the Holocene development of the Suriname coast. Over the past 6000 years, chernier plain deposits of Amazon-borne mud transported along the north coast of South America, have prograded >25 km seaward, leaving stranded coastlines in the marsh behind. Tidal influence has transported Amazon borne mud up the Suriname River, where it has settled on the river bed or in the back swamps during flooding. Between 1961 and 1964, a dam was constructed across the Suriname River to provide electricity for the processing of bauxite into alumina and for Paramaribo. This Afobaka Dam is located in the northern part of the shield. Construction of the Afobaka Dam is anticipated as having a great impact on the behaviour of the downstream part of the Suriname River. although this has yet to be investigated in detail. Generally, this part of the river will be more sensitive to tidal influences, which will result in a further upstream migration of the fresh-salt water interface. This study determines the possible impacts of the Afobaka Dam on the lower course of the Suriname River and on the coastal zone in a hydronamical, morphological and sedimentary way. The following study materials were used: aerial photography and satellite images from different years; and depth measurements for different years. The main channel of the Lower Suriname estuary was found to have silted up following the construction of the hydro-electric dam. No relevant shifting of the river's lower course was noticed for the last 50 years. There are two serious consequences:

- a) Because coarse sediments are trapped behind the dam, the downstream flowing water will have an erosional force which will change the local morphology of the river bed;
- b) Due to the regulation of the river discharge, especially during the large rainy season, the river is no longer annually flushed, which has caused an accelerated silting up of the fairway in the Suriname estuary.

Because of the heavy shipping traffic, the fairway is now being dredged.