The rivers of Africa: witness of climate change and human impact on the environment

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Abstract:

In this paper, we study the impact of climate change on river regimes in several parts of Africa, and we look al the most probable causes of these changes either climatically or anthropogenically driven. We study time series of updated monthly and annual runoff of rivers of North Africa, West Africa (Sahelian and humid tropical regions) and Central Africa, including the largest river basins: Niger and Volta rivers in West Africa, and Congo and Ogooue rivets in Central Africa. The recent years are studied in the perspective of multi-decadal variability. In West Africa and in a part of Central Africa, the climate has changed silice 1970, and rainfall has not returned to previous annual amounts, except in Équatorial Africa. The consequences of the long-listing drought are, depending on the area concerned, the modification of seasonal regimes (Equatorial area), the groundwater table decrease (Tropical humid area) and the land cover degradation (Sahelian area). The increasing number of dams and of agricultural areas also plays a major role on the modification of river regimes. The population increase will continue to impact on the environment: land cover change, deforestation, agriculture and increasing number of dams will be associated with a reduction of water and sediment discharges to the sea, and major impacts on downstream ecosystems and coastal areas. It seems necessary to share with stakeholders a comprehensive approach of the water cycle frein the basin to the sea, to prevent long-listing damages to ecosystems and infrastructures. Copyright 0 2013 John Wiley & Sons, Ltd.