

River Flow Monitoring and Data Quality for Equitable Nile Water Sharing

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Abstract

Stage and discharge monitoring, and data analysis and interpretation are essential for flood control, hydropower operation, navigation, water allocation, and ecological management. In the context of transboundary rivers hydrometric measurements are crucial to establish and maintain legal regimes of water allocation and operation of hydraulic infrastructures in the basin. In the case of the Nile, where there is no legal regime or prior comprehensive agreement, there is serious need for accurate data for negotiation and establishment of such legal regimes. Quality of stream flow data is dependent on who does the stream gauging, method of stream gauging, data acquisition, and data storage. Long-term historical stream flow data is needed to understand basin hydrology, stream flow trend, and changes. Blue Nile stream flow data obtained from different sources are examined in the context of ongoing negotiation of the filling and operation of GERD. The current negotiation is anchored on the data obtained from El Diem Sudan that gives a long term mean annual flow of 49 billion cubic meters (BCM). Analysis of a set of Blue Nile flow from different sources and temporal scales indicate significant inconsistency in the data sets. Variability of flow from different records shades doubt on the reliability of using a single series of historical data for long term negotiation. This paper considers different issues related to flow that affect the GERD negotiation and highlights the importance of accurate streamflow data, instrumentation, and the need for generating new data sets for long term operation and agreement. The paper stresses the importance of data quality, the type and location of hydrometric measuring stations and the impact associated with data error and measurement inaccuracies in the context of allocation and management of transboundary waters in general terms. Finally, the paper advises the importance of developing a protocol for upstream and downstream data sharing from all monitoring systems in the basin in a timely manner. An example of limitation of model generated streamflow data is illustrated.

Keywords: Flow monitoring, Blue Nile River, Grand Ethiopian Renaissance Dam, Data quality, Water sharing

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