

Critical Water Resources Management Issues and Challenges in the Nile River Basin

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ABSTRACT

The central water management issue for the Nile River Basin, as in many other river basins throughout the world, is sustainability of water supply in the context of intense population growth, recurring drought, and increasing competition for water. The issue gets complicated as a result of global climate change that is taking place at an alarming rate. A serious discussion of these and other important water resource issues and the challenges in the basin is necessary and needs our attention to seek solutions and insure sustainability of the water supply. This paper will address the physical and hydrological conditions of the basin as a background and present the cross-cutting issues of concern in the basin. The challenges to obtain, protect, and manage the basin's water supply and ecosystem will also be discussed. Even though one cannot make a meticulous coverage of all the issues and challenges in the basin, a serious attempt will be made to present possible solutions at local and regional scale. The solution will be geared towards getting more of the water, using it as much, and making it sustainable.

Blue Nile (Abay) Hydropower Potential, Prioritization and Tradeoffs on Priority Investments

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ABSTRACT

Ethiopia is among countries which has very low modern energy sources. The topographic feature and the available water of Ethiopia permit to have a large hydropower potential. However, as the available runoff in rivers has very high hydrological variability, tapping in to this potential require investment on storage to smooth the temporal hydrological variability. In this paper, first the behaviour of this hydrological variability and implication of water resources development is discussed. Secondly, various documents and reports provide varying values of hydropower potential of Ethiopia and Abbay. To close the information gap, topographical and hydrological site evaluation for the selected hydropower potential sites have been carried out, for 129 possible potentials sites which are identified by WAPCOS in 1990 and having total capacity of 13,845 MW. After evaluations these sites 91 possible sites with potential of 12,148 MW are identified and mapped under various sub-basins. Dabus sub-basin stands first among the 16 sub-basins by 13 hydropower potential sites and these sites give 3524MW. In order to exploit the available hydropower potential in the country, it is crucial to rank these sites. The ranking of these sites have been carried out based on cost per kilowatt hour of the hydropower potential (HP) sites. Furthermore, the paper qualitatively discusses the benefits and tradeoffs for four priority development identified by ENTRO as Eastern Nile fast track projects.

Key words: Hydrological variability, Abbay, hydropower, potential, tradeoffs

Building Resilience in Water Policy and Management:
Integrated Strategies to Meet the Challenge of Climate Change

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Abstract

Global warming poses a serious threat to economic well-being, security, public health, natural resources, and the environment. The potential impacts of climate change and variability are serious. Integrated policy, planning, and management of water resources systems can provide important opportunities to respond effectively to challenges posed by climate change. Both mitigation (i.e. reducing greenhouse gas emissions) and adaptation (dealing with impacts) strategies must be developed. While both energy and water managers have used integrated planning approaches for decades, the broader integration of water and energy management in the context of climate change is a relatively new and exciting policy area. Opportunities and approaches will be outlined, using California as a case study.

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Hydrological Water Availability, Trends and Allocation in the Blue Nile Basin ¹

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Abstract

The Blue Nile (known as the Abay in Ethiopia) is the principal tributary of the main Nile River providing 62% of the flow (approximately 50 billion m³ per year) reaching Aswan.

Ethiopia currently utilizes very little of the Abay water. In contrast, Sudan uses significant volumes both for irrigation (currently in excess of 1.1 million ha) and for hydropower production. However, there remains significant potential for additional exploitation and both Ethiopia and Sudan have plans to further develop the water resources of the river. In Ethiopia, several major irrigation schemes, with a total area of approximately 164,000 ha, are planned for completion by 2010. In addition several hydropower dams, including four located on the main stem of the river, are being contemplated. In the Sudan, no additional hydropower is being considered, but it is planned to develop an additional 889,000 ha of irrigation by 2025. In this study the Water Evaluation and Planning (WEAP) model was used to investigate both the current situation and future water demand scenarios. Time series of flows were generated (on a monthly time-step) to determine inter-annual and seasonal variability in water availability in the major tributaries. Existing water use, related to irrigation and hydropower, was estimated from actual data. Future development scenarios were based on information obtained from commissioned projects and the national water resource master plans. This paper illustrates the value of scenarios, and the application of a relatively simple model, to assess the implications of proposed water resource development.

Key words: Abay, Blue Nile, Water Allocation, Water Use Potential, WEAP

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