



A socio-hydrological approach for assessing the Eco-system sustainability of water resource development; Abbay/Blue Nile Basin, Ethiopia

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The Nile River traverses about 4,185 miles (6695 km) from its sources in the Equatorial Lakes Region and the Ethiopian highlands to its outlet into the Mediterranean Sea. The Nile is having an ancient history in insecurity, water scarcity and presently characterized as rapidly growing population and demand for water which is becoming a challenge. The Nile River is mainly dominated by the Blue Nile sub-basin covering an area of 311,548km². The water allocation with in the river basins for various competing users is totally based on satisfying the respective current demands while neglecting the associated adverse impacts on future water availability, society interest, sustainability and ecological integrity.

The Blue Nile River basin has been selected as a case study for detailed research which will undertake an inter disciplinary approach to understand the past, present and future flow alteration in the regime. The main aim of the research is to understand and quantify the interaction between social and hydrological aspects in the flow regime. The multi-disciplinary approach will be used to understand and quantify the interactions. A detail resource survey supplemented with Global Positioning System (GPS) readings will be conducted and flow alteration will be analyzed using IHA software. The land use and ecosystem change will be analyzed using GIS and satellite images. The change in hydrology and social impact in the basin will be analyzed using WEAP model including water resource development and management.

The research focuses to determine outcomes that result in sustainability of the ecosystem while meeting societal needs for economic development and growth, all of which is mediated through a water allocation in the regime that impacts the hydrologic cycle. Therefore, this study comes up with an idea of an interdisciplinary and holistic approach, which will fill the information gap by addressing socio-hydrology relationships and feedbacks to human welfare using integrated strategy or measures.