

## **Exploring Technologies for Sustainable Transboundary Water Resource Sharing in the Era of Climate Change: A Case for the River Nile Basin Riparian States**

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### **Abstract**

This paper explores technologies for sustainable transboundary water resource sharing in the era of extreme climatic events in and across the River Nile Basin riparian states. Climate change has been attributed to both natural and anthropogenic forcings. The adverse impacts of changing weather patterns have resulted in global efforts towards mitigation and adaptation through the United Nations Organization (UNO) satellite organizations. These include the World Meteorological Organization, (WMO), the United Nations Environmental Programme (UNEP) and the Inter-Governmental Panel to Climate Change, (IPCC). Treaties, Conventions and Conference of Parties (COPs) also address extreme weather and climatic conditions. Examples include the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The landmark declarations of the COP 2015 Paris Agreement in which nations committed to address anthropogenic causes of climate change and commit to adaptation and mitigation funding was a step towards climate change mitigation. Most models predicting future emission pathways show increasing temperature trends. Such trends will impact on the environment including water resources, the hydrological cycle and community livelihoods and cause famine and poverty thereby resulting in large numbers of climate refugees. The Nile Basin which covers over 10% of Africa's landmass in 11 countries including Ethiopia, Sudan, South Sudan, Egypt, Rwanda, Tanzania, Uganda, Burundi, the Democratic Republic of Congo (DRC), Eritrea and Kenya is a development engine across the Nile riparian states. A combined population estimated at 257 million, which is 53% of the Nile Basin countries depend in one way or the other on the waters of the Nile. The predicted extreme weather and climate scenarios will therefore spell doom in the form of famine, hunger and migration. Extreme weather patterns manifested in the form of floods would push further the poverty levels and degradation of water towers feeding River Nile. As negotiations on the sharing of the Nile waters continue, the riparian countries should include clauses to ensure that this precious resource will be there tomorrow and that the current efforts will not be in vain. The riparian countries should therefore jostle for climate change mitigation and adaptation funds and adoption of climate smart technologies including the application of geospatial technologies and remote sensing. Such technologies can be employed in rapid Environmental Impact Assessment (EIAs) on proposed projects in the Nile Basin. The objectives of this paper therefore includes: i) to establish the

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current trends in weather patterns and climate change in the Nile Basin, ii) to establish the adverse impacts of changing weather patterns in the Nile Basin, iii) To explore sustainable strategies and technologies that could be employed to address pertinent issues arising from changing weather patterns in relation to hydrology of the Nile valley. The paper uses desktop research method to mine adequate data on technologies, climate and weather variability in the riparian states in the Nile Basin. Data analysis is done using descriptive statistics and presented in the form of themes and graphs. The paper contributes towards enhancing knowledge on extreme weather patterns and technologies and in understanding river basin hydrology.

**Keywords:** Climate Change, Weather Variability, Climate Forcings, Adaptation, Mitigation