

## Amelioration of climate change uncertainties with indigenous perceptions in the Niger Basin, West Africa

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Since the 1970s, the Niger Basin has been characterized with significant regional hydro-climatic changes which come with high uncertainties on ecological systems at the local scale. A research aimed at integrating scientific observations with local perceptions for ameliorating the impacts of climate change uncertainties was conducted on two catchments located in the middle (Malanville, Benin) and lower (Kainji Lake, Nigeria) Niger Basin. Structured questionnaire on climate related issues, their methods and challenges of adaptations was used to evaluate the perceptions of 239 respondents from thirty communities. Historical rainfall, temperature and river discharge were analyzed from 1950-2010 in the two catchments. Results show that the two catchments are adhered with high uncertainties that the local people are sensitive and have grown indigenous mechanisms of resilience to their impacts. Higher rainfall variability was domiciled in Malanville which was reported by 97% of the respondents and lower rainfall variability was prominent in Kainji Lake environments (29% respondents). Additional uncertainties were revealed through the influence of 'Flow regulation' on stabilization and aggravation of floods at the upstream (19.1% respondents) and downstream (84% respondents) the Kainji Lake respectively. The two catchments were also identified with increasing unforeseen floods during the White Flood season (August to November) which comes with great influence on economic activities. Despite reported high awareness of climate change and its impacts, adoption of methods of adaptation was generally low in the two catchments (48% in Malanville and 51% in Kainji). The most prominent observed local resilience to drought was the use of irrigation, diversification of activities and water treatment. Drainage channels, small dams and dikes are often deployed to ameliorate impacts of floods in the catchments. Reported challenges of adaptation include inadequate early warning systems to climate change extremes (43% and 51%) and low assistance by government in the provision of sustainable mechanisms of resilience to the adversities of climate change. Based on our findings we proposed the integration of local knowledge into climate change science in order to combat adversities of climate change and its uncertainties in data scarce region. Involvement of NGOs and empowerment of existing regional integration to be able to combat local adversities of climate change along with other methods of sustainable integrated Niger River Basin management were proposed.

Keywords: Climate Change, Perceptions, Uncertainties, Adaptations.