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Identification and Evaluation of Ecosystem-based Approaches for Flood Risk Reduction in the Transboundary Lower Mono River Catchment in Benin and Togo

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Floods in West Africa repeatedly cause devastating impacts on human life and livelihoods, infrastructure and the environment and they are expected to increase in frequency and severity under a changing climate. Ecosystem-based approaches can be a cost-effective, efficient way to reduce flood risk while at the same time providing co-benefits. However, qualitative and quantitative assessments of ecosystem-based approaches that are suitable for the climatic conditions and socio-ecological system of the region are scarce. This study therefore identifies and evaluates climate-sensitive ecosystem-based approaches for the transboundary Lower Mono River Basin in Benin and Togo. The identification of ecosystem-based approaches has been done based on a review of scientific literature and complemented by a participatory approach with experts from the catchment. During focus group discussions, national stakeholders and policy makers identified, prioritized and mapped existing measures and provided their perspectives on prospective measures to reduce flood risk in the transboundary catchment. They include measures to reduce flow velocity, increase soil infiltration and improve water management. In a next step, we used a multi-criteria analysis considering ecological, climatic and flood hazard data to create suitability maps for different clusters of identified ecosystem-based approaches. This study is part of the CLIMAFRI project, which aims at creating a river basin information system for the Lower Mono Basin as well as creating a flood risk management plan. Through the integration of the suitability maps into the flood risk assessment tool, which has been created in the scope of this project, the ecosystem-based approaches are evaluated quantitatively. In a second round of focus group discussions with representatives from the local communities, feasibility of selected ecosystem-based approaches, co-benefits and trade-offs of the measures are discussed. Through the combination of qualitative and quantitative data, a holistic evaluation of ecosystem-based approaches and their contribution to hazard mitigation, increase of coping capacity, ecosystem resilience and overall flood risk reduction can be achieved.