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Agricultural Use and Vulnerability of Small Wetlands in East-Africa

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Abstract

Research on small wetlands in East-Africa has been largely neglected in the past. The majority had been unused until the mid 1980s. Rapid population growth and associated demands for food have led to increasing conversions of wetlands into sites of food production since then. Some wetlands remain resilient when taken under cultivation while others collapse after a few years. A collaborative research project has been established in 2007 to understand the underlying reasons from agronomic, ecological, economic, geographical and hydrological viewpoints. This presentation summarises its main findings.

51 wetlands and their subunits were initially inventoried in a 484 km² survey area in Kenya and Tanzania. Five major cluster groups were identified comprising (1) largely unused narrow permanently flooded inland valleys, (2) extensively used wide permanently flooded inland valleys and highland floodplains, (3) medium used large inland valleys and lowland floodplains with seasonal flooding, (4) completely drained wide inland valleys and highland floodplains under intensive cultivation, and (5) narrow drained inland valleys under permanent horticultural production. Main drivers of wetland use change are land scarcity in upland areas, physical access, water availability, and market proximity.

Detailed multidisciplinary studies were carried in two floodplain (Pangani river, Laikipia) and two highland wetlands (Mt. Kenia, Usambaras). The two highland wetlands were generally more productive and less vulnerable than the two floodplain wetlands. Degradation and ecological regime shifts were primarily caused by drainage beyond the water supply level. Spatial-temporal soil water availabilities differed between the highland and floodplain wetlands. Prolonged cultivation lead to stronger declines in soil C and N in the floodplain wetlands than in the highland wetlands. Changes in vegetation composition reflected alterations in hydrologic and edaphic conditions. A fieldbook of indicator species was produced to enable decision makers to assess the consequences of their management actions. A household survey was carried out in 275 randomly selected farms. 12 farms types were identified based on different combinations of land attributes and production objectives. Highland and lowland wetland characteristics were reflected in remote sensing surveys. Analyses of historical land-use maps revealed temporal patterns in use changes.

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