

**MANAGING UPSTREAM WATER ABSTRACTIONS FOR MINIMAL IMPACT ON
THE ECOLOGY OF THE FLOOD-PULSED OKAVANGO DELTA, BOTSWANA**

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The Okavango Delta is a large (12000 km²) wetland, the world's largest RAMSAR site, located in north-western Botswana, in a semi-arid area covered by Kalahari sands. In response to the flood pulse from the Okavango River catchment, the extent of inundated area attains its annual low of 2500-4000 km² in February-March and its annual high of 6000-12000 km² in August-September. The Okavango Delta flood cycle is out of phase with the rainy season, which occurs between December and March. This hydrological setting creates a unique ecology, the primary drivers of which are frequency and duration of inundation. Spatial differences in these two factors underlie formation of major hydro-ecological zones: permanent floodplains, seasonal floodplains and occasional floodplains, which differ in species composition, biomass productivity and resource availability to animals and people, and thus their regional ecological role.

The water resources of the Okavango River and the Delta itself are targeted for development. Abstractions for human use and irrigation in upstream Angola and Namibia, although so far not large (around 20 Mm³/a), may possibly increase considerably (to 700 Mm³/a). Modification of the Okavango River hydrograph will affect the spatial extent and distribution of the hydro-ecological zones in the distal Delta. In this paper, based on spatial hydrological modelling, we assess the effects of abstractions on the Okavango Delta hydroperiod, considering various possible abstraction schemes: uniform throughout the year, during the low-flows, during peak flow etc, and their implications for floodplain ecology. In this way, we aim to provide a basis for the least-impact management solutions.