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Mitigation of negative ecological and socio-economic impacts of the Diama dam on the Senegal River Delta wetland (Mauritania), using a model based decision support system

S. Duvail[1] and O. Hamerlynck[2]
[1]Centre for Ecology and Hydrology, Crowmarsh Gifford, Wallingford, OX10 8BB, UK
[2]IUCN, 28 rue Mauverney, 1196 Gland, Switzerland
Email for corresponding author: sduv@ceh.ac.uk

Abstract.

Abstract: The delta of the River Senegal was modified substantially by the construction of the Diama dam in 1986 and the floodplain and estuarine areas on the Mauritanian bank were affected severely by the absence of floods. In 1994, managed flood releases were initiated in the Bell basin (4000 ha) of the Diawling National Park, as part of a rehabilitation effort. The basin was designated as a joint management area between traditional users and the Park authority and a revised management plan was developed through a participatory approach based on a topographical, hydro-climatic, ecological and socio-economic data. Hydraulic modelling was developed as a tool to support stakeholder negotiations on the desired characteristics of the managed flood releases. Initially, a water balance model was developed. The data were then integrated into a one-dimensional hydraulic model, MIKE 11 (DHI, 2000). When associated with a Digital Elevation Model and a Geographic Information System, (Arc View), the model provided a dynamic description of floods. Flood extent, water depth and flood duration data were combined with ecological and socio-economic data. The water requirements of the different stakeholders were converted to flood scenarios and the benefits and constraints analysed. A consensus scenario was reached through a participatory process. The volume of flood release required to restore the delta does not affect hydro-power generation, navigation or intensive irrigation, for which the dams in the basin were constructed. Hydraulic modelling provided useful inputs to stakeholder discussions and allows investigation of untested flood scenarios.

Keywords: wetland restoration, water use conflicts, equity, Senegal River delta, Mauritania, Diawling National Park

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