

## Research Theme 4

### Water Management and Environment

# Environmental Equity: Striking the Right Balance between Agricultural Expansion and Ecosystem Health



"The ecosystem component of the Comprehensive Assessment presented an opportunity to highlight the 'costs of going too far' with agricultural and water development. This does not mean that agricultural and water resource practitioners need to curtail their efforts to provide more food and water to people; rather, it means that some smart

(smarter) thinking is necessary if we are to obtain a sustainable balance between the production of food and the provision of other ecosystem services."

Max Finlayson – Theme 4 Leader

Agricultural systems depend greatly on ecological processes and the services provided by wetlands, lakes and rivers as well as agro-ecosystems such as rice fields, forests and coastal areas. Ecosystems support agriculture, produce fiber and fuel, regulate freshwater and purify wastewater. They regulate the climate, provide protection from storms, mitigate erosion and provide opportunities for recreation and tourism. In 2006, under its Theme 4 research, "Water Management and Environment", IWMI developed and tested best practice frameworks that included the environment in water resources management. Research looked at enhancing the benefits in agriculture-wetlands interactions through appropriate policies and practices as well as tools for aiding resource allocations and decision making. It also outlined tools for assessing the economic value of the range of ecosystem services to basin water and land productivity, poverty reduction and livelihood strategies. It emphasized the importance of biodiversity which strengthens ecosystem resilience and the maintenance of agro-ecosystems and fisheries.

Through research for the CA, Theme 4 examined past activities, assessed opportunities and closed several knowledge gaps. One priority area for Theme 4 research was the integrated management of agriculture and wetlands with an emphasis on examining how wetlands could be used in a sustainable way for livelihoods.

IWMI continued its work on integrated analyses of the impacts of uses of wetlands on both livelihoods and wetland functioning. As stated in the Millennium Ecosystem Assessment (MEA 2005) the well-being of people is intimately linked to the capacity of ecosystems to provide a range of vital ecosystem services, especially to the poor who depend directly on ecosystems for their livelihoods.

IWMI developed an inventory of information on wetlands and the many ecosystem services they provide. This inventory is addressing a major knowledge gap about the importance of wetlands for agriculture. Information provided can support the development of tools for better analyzing the synergies and trade-offs within wetlands. The impact of IWMI's research is extended through formal agreements in place between Ramsar and other international bodies such as IUCN and FAO-GTOS, that have an explicit interest in water management and agriculture. IWMI also conducted the first ever global assessment of environmental water needs and how these requirements (environmental flows) can be implemented.

IWMI contributed to Chapter 6 of the Comprehensive Assessment Synthesis Book. This chapter, titled "Agriculture, water and ecosystems: avoiding the costs of going too far", examines the wide scale changes in land cover, water courses and aquifers which have contributed to ecosystem degradation and the undermining of ecosystem services. It states that agricultural technology and management practices must be improved to enhance ecosystem services that benefit the rural poor. These practices should maintain biodiversity which underpins ecosystem services. As far as possible, ecosystems should be managed to mimic their natural state and character. To support these efforts it is important to raise awareness of the role and value of ecosystem services through dialogue and dissemination with diverse stakeholders. Inventories, assessments and monitoring of factors related to ecosystem resilience also need to be closely monitored.



IWMI's research emphasizes the importance of biodiversity for strengthening ecosystem resilience and the maintenance of agro-ecosystems and fisheries.

Photo Credit: Sanjini De Silva



Migrating birds depend on lakes and streams in wetlands for breeding.

Photo Credit: Maria G. Bellio