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FEATURES

Balancing agricultural development with environmental protection

In many parts of the world, the growing demand for food is putting increased pressure on wetlands. The trade-off between environmental protection and development is most acute in dynamic and complex systems such as wetlands. At the same time it is recognized that wetlands 'work' for society by sustaining livelihoods and supporting ecosystem services that provide benefits for people. Livelihoods and many ecosystem services are supported by biodiversity and ecological interactions within wetlands. However, socio-economic pressures mean that we are pushing wetlands to work even harder by producing more crops or grazing more cattle. History shows that over-working wetlands can cause them to change significantly, often with negative effects on the communities or civilizations that depend on them.

The livelihoods of people living in or on the borders of wetlands often depend partially or entirely on wetland ecosystem services. In Cambodia, fish from the freshwater Tonle Sap wetland ecosystem provides 60 -80% of the country's animal protein. In Malaysia, rural households earn up to US$ 80 a month selling medicinal plants gathered from wetlands. In the USA, the Everglade wetlands in Florida supply five million people with water.

Wetlands support a rich diversity of plants and animals. These species and their genetic diversity help to maintain wetland processes such as water storage, sediment trapping and nutrient cycling. Wetlands are especially important for many migratory birds. The wetlands of Bundala in Sri Lanka are protected by the Ramsar Convention on Wetlands and are home to diverse migratory

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birds, drawing large numbers of nature enthusiasts.

Wetlands also play a critical role in maintaining the quality of the environment by absorbing and processing waste products. Biologically, they cycle carbon dioxide, methane and hydrogen sulfide. They 'sequester' or trap and release carbon, regulating climate change. Globally wetland peat deposits take up just 3% of the land area but store 14-16% of the soil carbon pool.

The Muthurajawela Marsh and the adjoining Negombo Lagoon located along the western coast of Sri Lanka cover a combined area of approximately 12, 000 hectares. Muthurajawela is the largest saline coastal peat bog in Sri Lanka, which together with the Negombo lagoon forms an integrated coastal wetland ecosystem. It was listed as one of 12 priority wetlands in Sri Lanka in 1996 and its northern part was declared a wetland sanctuary due to its uniqueness in both marine and terrestrial components. The surrounding landscape has long been used for agriculture and in more recent times for aquaculture. In addition, as it is one of the most urbanised and industrialised parts of the country, there is increasing pressure to convert the wetlands for other uses. The wetland complex is located alongside a rapidly developing urban area and is being increasingly degraded by development activities. An inventory and assessment has been undertaken to quantify the extent of biophysical change in the wetland complex over the past few decades and to investigate some of the socio-economic drivers of change over this period. This included the identification of "indicators of stress" in the wetland and an analysis of the extent of ecological change and future potential threats.

The International Water Management Institute (IWMI) is undertaking an integrated wetlands inventory by collecting social, economic and ecological information to assess the extent of sustainable agriculture in wetlands and to assess the trade-offs made between agriculture and ecosystem services. IWMI undertakes technical analyses, such as change detection using satellite imagery and GIS, to consider and seek balances between: the reliance of local communities on wetlands; the importance of wetland agriculture

for livelihoods; the benefits derived from wetlands by socio-economic and gender groups; and the extent of the benefits that extend beyond the wetland, for example downstream and globally. Through this work we promote the concept of "wise use" of wetlands and have a formal partnership with the Ramsar Convention on Wetlands which recognizes the need to integrate conservation and development.

Policy makers and planners need to ensure that they take the most comprehensive range of factors possible into account in any trade-off between wetland services and development choices. IWMI has developed a six –step approach called the "Working Wetland Potential" to help assess the opportunities and risks of changing a wetland's workload. This method, one of the first of its kind, combines both the social and biophysical aspects of wetlands into one index relevant to agricultural use.

(IWMI)