

Managing Wetlands and Reducing Poverty: Issues and Challenges

WETLAND BENEFITS TO PEOPLE

Wetlands provide a large array of ecosystem services—defined as the benefits people derive from nature—to Ugandans in urban and rural areas (see Table 1). They are used for farming, fishing, and livestock grazing. They supply families with basic needs such as water, construction material, and fuel. In addition to these local uses, the system of interconnected wetlands plays a crucial role at a regional level by filtering pollutants and regulating water flows (influencing groundwater recharge, flood impacts, and water availability during the dry season). Of a total population of 28 million Ugandans, it is estimated that wetlands provide about 320,000 workers with direct employment and provide subsistence employment for over 2.4 million (MFPED, 2004).

Uganda's wetlands also provide important ecological benefits that reach beyond the region. They are the home of globally endangered species including birds such as the Shoebill (*Balaeniceps rex*) and Fox's weaver (*Ploceus spekeoides*), and fish species of the Cichlidae family. Many wetlands are an important stopover for large congregations of migratory water birds. Wetlands can act as a reservoir to store carbon dioxide, mitigating climate change impacts. National and international visitors seek out wetlands as tourist attractions and educational opportunities to learn about their unique animals and plants.

In Uganda, there are no recent, exact countrywide statistics on changes in wetland area—the latest national land cover map with detailed wetland information was produced in 1996 (NFA, 1996). However, local observations cited in Uganda's recent State of the Environment report indicate a reduction in wetland coverage, mostly due to conversion to cropland (for example, in Iganga District and southwestern Uganda) and the spread of urban settlements, as in Kampala (NEMA, 2007).

While such conversions provide economic benefits from agricultural crops and real estate development, they are also associated with social costs primarily due to reduced or total loss of hydrological functions, habitat benefits, or other ecosystem services. One of the factors driving these conversions is that the immediate economic returns to individuals appear to outweigh the costs to the wider society associated with the loss of important ecosystem benefits. However, in most cases, the economic costs are

Table 1 ECOSYSTEM SERVICES PROVIDED BY OR DERIVED FROM WETLANDS

Services	Examples
PROVISIONING ECOSYSTEM SERVICES <i>Products obtained from ecosystems</i>	
Food	Production of fish, wild game, fruits, and grains
Fresh Water	Storage and retention of water for domestic, industrial, and agricultural use
Fiber and Fuel	Production of logs, fuelwood, peat, and fodder
Biochemicals	Extraction of medicines and other materials from biota
Genetic Materials	Genes for resistance to plant pathogens, ornamental species, etc.
REGULATING ECOSYSTEM SERVICES <i>Benefits obtained from regulation of ecosystem processes</i>	
Climate Regulation	Source of and sink for greenhouse gases; influence local and regional temperature, precipitation, and other climatic processes
Water Regulation (Hydrological Flows)	Groundwater recharge and discharge retention
Water Purification and Waste Treatment	Retention, recovery, and removal of excess nutrients and other pollutants
Erosion Regulation	Retention of soils and sediments
Natural Hazard Regulation	Flood control and storm protection
Pollination	Habitat for pollinators
CULTURAL ECOSYSTEM SERVICES <i>Nonmaterial benefits obtained from ecosystems</i>	
Spiritual and Inspirational	Source of inspiration; many religions attach spiritual and religious values to aspects of wetland ecosystems
Recreational	Opportunities for recreational activities
Aesthetic	Source of beauty or aesthetic value in aspects of wetland ecosystems
Educational	Opportunities for formal and informal education and training
SUPPORTING ECOSYSTEM SERVICES <i>Services necessary for the production of all other ecosystem services</i>	
Soil Formation	Sediment retention and accumulation of organic matter
Nutrient Cycling	Storage, recycling, processing, and acquisition of nutrients
Source: MA, 2005.	

UGANDA'S DEFINITION OF WETLANDS

Uganda's National Policy for the Conservation and Management of Wetland Resources (1995) defines wetlands as areas "where plants and animals have become adapted to temporary or permanent flooding." It includes permanently flooded areas with papyrus or grass swamps, swamp forests or high-altitude mountain bogs, as well as seasonal floodplains and grasslands. While all wetlands are characterized by impeded drainage, the length of their flooding period, depth of water, soil fertility, and other environmental factors vary with different wetland types. Wetlands are home to distinctive plant and animal communities that are well adapted to the presence of water and flooding regimes.

Source: MNR, 1995.

not fully accounted for because some ecosystem services—mostly regulating services such as groundwater recharge, water purification, waste treatment, or flood control—are not factored into conventional economic analysis. Instead they are considered as non-monetary bounties of nature that are "free-of-charge." They are what economists call "public goods," which have virtually no agreed value in the market place.

As a result, the financial incentives driving land use are often not aligned with the goal of managing and conserving these services for the broader public good. The economic benefits from marketed products of converted wetlands are often greater than returns from subsistence use and small-scale resource extraction in the unconverted wetlands. However, when both the marketed and non-marketed values of ecosystem services are accounted for, the total economic value of unconverted wetlands can be greater than that of converted wetlands. For example, conservative economic valuation estimates put the direct annual productive value of wetlands at 450,000-900,000 Uganda Shillings (US\$ 300-600) per hectare (MFPED, 2004).

WETLANDS AND WATER SUPPLY

Women and girls come to fetch water for the day, or come to wash their clothes. Approximately 5 million people in rural areas get their daily freshwater supply from wetlands. The economic value of this service alone has been estimated at US\$ 25 million per year in Uganda.

Source: UN-WWAP and DWD, 2005.

Economic valuation studies that include a broader set of non-marketed regulating services, such as water purification and carbon sequestration, suggest a per hectare-value as high as 15 million Uganda Shillings (US\$ 10,000) (MFPED, 2004). Unfortunately, despite their high economic value, wetlands are not yet managed as environmental capital, worthy of protection and investment. In the Nakivubo wetland, an urban wetland in Kampala, the value of water treatment and purification services from a fully used and intact wetland are estimated at 2.3–4.3 million Uganda Shillings (US\$ 1,500-2,900) per hectare per year (Emerton et al., 1999). However, over the past decade, the potential of the wetland to remove nutrients and pollutants has been greatly reduced by growing human settlements, industrial establishments, and drainage channels for crop production (NEMA, 2008). More than half of the wetland has been modified with only the lower parts remaining in fair condition. Consequently, water quality in the discharge area of Inner Murchison Bay of Lake Victoria has steadily deteriorated leading to higher treatment costs for Kampala's drinking water pumped from this area. The environmental and social impact assessment of the planned expansion of the Kampala Sanitation Programme has proposed a two-pronged approach to improve water quality in Lake Victoria: reduce the pollutant load by expanding sewage treatment facilities in Kampala and rehabilitate Nakivubo wetland (including a substantial increase of the active wetland area) to reestablish its original treatment capabilities (NEMA, 2008).

POVERTY MAPS

The 2005-2006 Uganda National Household Survey, which estimated the national poverty rate at 31.1 percent or 8.4 million Ugandans, provided the foundation for the poverty maps used in this publication (UBOS, 2006b).

The Uganda Bureau of Statistics (UBOS) used the previous Uganda National Household Survey (2002-2003) to produce two versions of poverty maps—for 1999 and 2002—in order to address the lack of poverty data for small administrative areas in the country.

The 1999 poverty maps (UBOS and ILRI, 2004) provided, for the first time, spatially detailed poverty data for 320 counties. The 2002 poverty maps (UBOS and ILRI, 2007) increased the level of spatial resolution even further, providing data for 958 subcounties. The 2005 poverty maps provide data for all rural subcounties except for those in Kotido, Kaabang, and Abim Districts (UBOS and ILRI, 2008).

The 2002 and 2005 poverty maps rely on a statistical estimation technique (small area estimation) that combines information from the 2002 population and housing census and the 2002–2003 and 2005–2006 household survey, respectively. The level of detail obtained at subcounty permits more meaningful spatial overlays of poverty met-

WETLANDS AND FISHERIES

In the very early morning, fisherfolk return from their night's work. Their catch will not only be sold in the market but also feed their family. Fisherfolk know firsthand that they will find more fish where a healthy wetland provides a nursery and safe haven for young fish. Local people are aware of the linkages among the different benefits they derive from nature. In Lake Bunyonyi, most people interviewed (64 percent) recognized that the swamps sustain fisheries. Consequently, fishers rarely harvest papyrus or cultivate near to where they fish.

Source: Maclean et al., 2003.

rics and wetland indicators. Such spatial comparisons can help target poverty reduction and wetland conservation efforts and provide first insights into relationships between poverty, wetland status, and use of wetland resources.

Map 1 (page 6) displays the 2005 poverty rates for rural subcounties. Other poverty measures such as the poverty density (number of poor per square kilometer), poverty gap, and poverty severity are also available for these subcounties, as are estimates of inequality related to household expenditures.

Rural poverty rates in Uganda's subcounties range from less than 15 percent to more than 60 percent of the population, with brown areas indicating higher and green areas representing lower poverty levels. Map 1 shows a high geographic concentration of poverty in northern districts (e.g., Gulu, Amuru, Kitgum, Pader, Moroto, and Nakapiripirit Districts) and low poverty in the southwest and central part of the country (e.g., in parts of Mbarara, Bushenyi, Isingiro, Kibaale, and Wakiso Districts). The reasons for this spatial pattern are complex, and include factors such as rainfall and soil quality (which determine agricultural potential), land and labor availability, degree of economic diversification, level of market integration, and issues of security and instability (the latter is especially relevant for the northern parts of Uganda).

WETLANDS AND POVERTY LINKS

Poor people, especially in rural areas, generally rely on ecosystem services directly for subsistence and income-generating activities or to obtain water and medicines because of lack of affordable alternatives. Wetlands are also an important source of cash income, especially in emergencies. One of the few studies about the relationship between poverty and wetlands in Uganda showed, for example, that an overwhelming majority of papyrus harvesters in the Lake Bunyonyi wetlands sold raw papyrus or crafts made from papyrus to bridge income shortfalls for periodic high expenses such as school fees or end-of-the-year festivities (Maclean et al., 2003).

High dependence on ecosystem services combined with few assets and capabilities make poor people particularly vulnerable to ecosystem degradation (MA, 2005). Consequently, the condition of wetlands and the way they are managed can have a disproportionate impact on the well-being of poor families (Maclean et al., 2003). In 1997, Uganda set up the Poverty Eradication Action Plan (PEAP) to guide public action to eradicate poverty (MF-PED, 2004). This national planning framework, revised in 2000, acknowledges the role of wetlands in reducing poverty and in preventing people from falling further into poverty. Recognizing this important role, the PEAP supports priority actions in six areas related to wetland management:

- Assess the economic and environmental benefits of different wetland uses more comprehensively;
- Further develop and disseminate guidelines for sustainable use of wetland resources;
- Improve community skills and diversify the range of products obtained from wetlands to increase wetland revenues;

ECOSYSTEM SERVICES FROM WETLANDS ARE INTERDEPENDENT

Papyrus is a common plant in permanent wetlands. It provides a combination of provisioning services (fuelwood, furniture, construction material, and craft material), regulating services (water purification, wastewater treatment, soil erosion regulation, and carbon sink through its dense network of roots), and aesthetic services (bird watching, beautiful landscapes). The overharvest of papyrus (a provisioning service) can endanger its other services in that location, for example by weakening its root network and its function as habitat for wildlife.

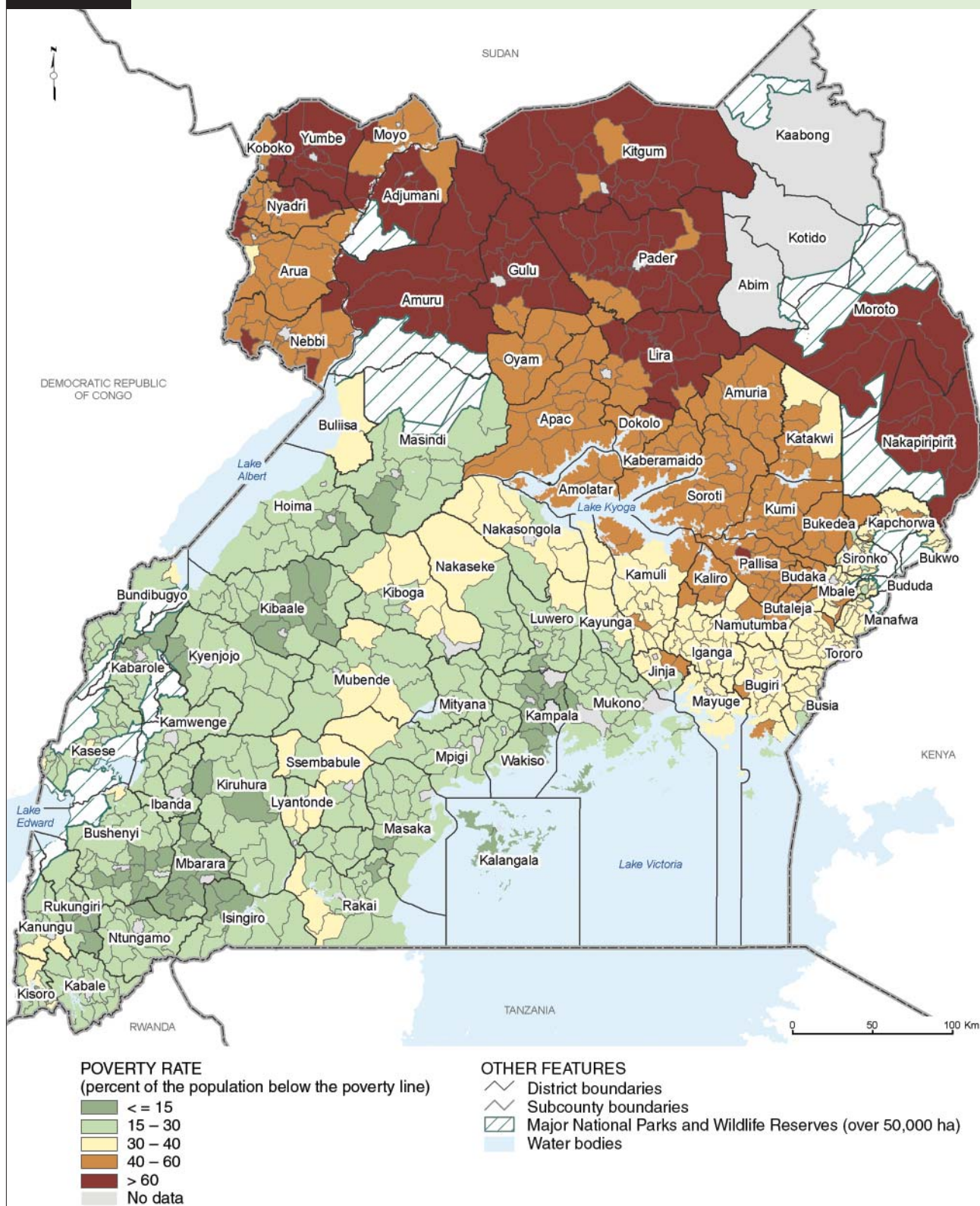
NAKIVUBO WETLAND: SERVICES TO LOCAL COMMUNITIES AND KAMPALA CITY

In Nakivubo wetland, 20 minutes from downtown Kampala, farmers grow cocoyam and sugarcane. About eight percent of the residents around Nakivubo wetland, which includes a high number of urban poor, are engaged in subsistence or commercial activities related to the wetland. In addition to supporting these local activities, Nakivubo wetland functions as a natural waste treatment plant for Kampala. It filters industrial effluents and domestic wastewater from 465,000 people (about 40 percent of Kampala's population), resulting in the discharge of less polluted water into Inner Murchison Bay of Lake Victoria.

Source: Emerton et al., 1999.

Map 1

POVERTY RATE: PERCENTAGE OF RURAL SUBCOUNTY POPULATION BELOW THE POVERTY LINE, 2005



Sources: International boundaries (NIMA, 1997), district administrative boundaries (UBOS, 2006a), subcounty administrative boundaries (UBOS, 2002a), water bodies (NFA, 1996; NIMA, 1997; Brakenridge et al., 2006), and rural poverty rate (UBOS and ILRI, 2008).

- Enforce appropriate policies, laws, procedures, and regulations to curtail degradation of wetland resources;
- Assess wetland resources to determine resource availability and trends; and
- Support community initiatives that promote sustainable use of wetlands.

The ten-year Wetlands Sector Strategic Plan, adopted in 2001, commits the country to implement eight key strategies to achieve sustainable wetlands management. Cognizant of the importance of wetlands to the well-being of poor people, the Wetland Sector Strategic Plan's mission states that the wise exploitation of wetlands shall contribute to economic development and poverty alleviation (WID, 2001).

Box 1

POVERTY MEASURES USED IN THE 2005 POVERTY MAPS

Human well-being has many dimensions. Sufficient income to obtain adequate food and shelter is certainly important, but other dimensions of well-being are crucial as well. These include good health, security, social acceptance, access to opportunities, and freedom of choice. Poverty is defined as the lack of these dimensions of well-being (MA, 2005).

The poverty indicators produced by the Uganda Bureau of Statistics (UBOS) are based on household consumption and cover some but not all dimensions of poverty. Consumption expenditures include both food and a range of non-food items such as education, transport, health, and rent. Households are defined as poor when their total expenditures fall below Uganda's rural or urban national poverty lines. These lines equate to a basket of goods and services that meets basic monthly requirements (UBOS and ILRI, 2007).

In 2005, the national poverty line (an average of the poverty lines in Uganda's four regions) was 20,789 Uganda Shillings (US\$ 12) per month in rural areas and 22,175 Uganda Shillings (US\$ 13) per month in urban settings. With these poverty lines, the 2005 poverty rate (percentage of the population below the poverty line) was 31.1 percent at the national level, translating to about 8.4 million Ugandans in poverty (UBOS, 2006b). Rural and urban poverty rates differed significantly, at 34.2 percent for rural areas and 13.7 percent for urban areas.

In this publication, poverty rate (percent of the population below the poverty line) was selected to portray the geographic distribution of the poor. While there are other useful poverty indicators, this indicator was chosen as a first approximation to show how poor each subcounty is and where poor subcounties are spatially concentrated. With this information, decision-makers can gain first insights to develop more effective support and services for the poor. In most cases, additional analyses using metrics that capture the number of poor per area (poverty density), the depth and severity of poverty (e.g., poverty gap and squared poverty gap), and other dimensions of well-being will be needed to better understand poverty patterns and examine cause-and-effect relationships.

