



## **A CASE STUDY IN INTEGRATED ASSESSMENT: WETLANDS BIODIVERSITY, LIVELIHOOD AND ECONOMIC VALUE IN MTANZA-MSONA VILLAGE, TANZANIA**

Policy Brief

Prepared by Jessica Campese, adapted from Kasthala *et al.*, (2008)



IUCN - International Union for Conservation of Nature



*This project has been funded by the UK government through Defra's Darwin Initiative, which draws on the wealth of biodiversity expertise within the UK to help protect and enhance biodiversity around the world.*

## OVERVIEW

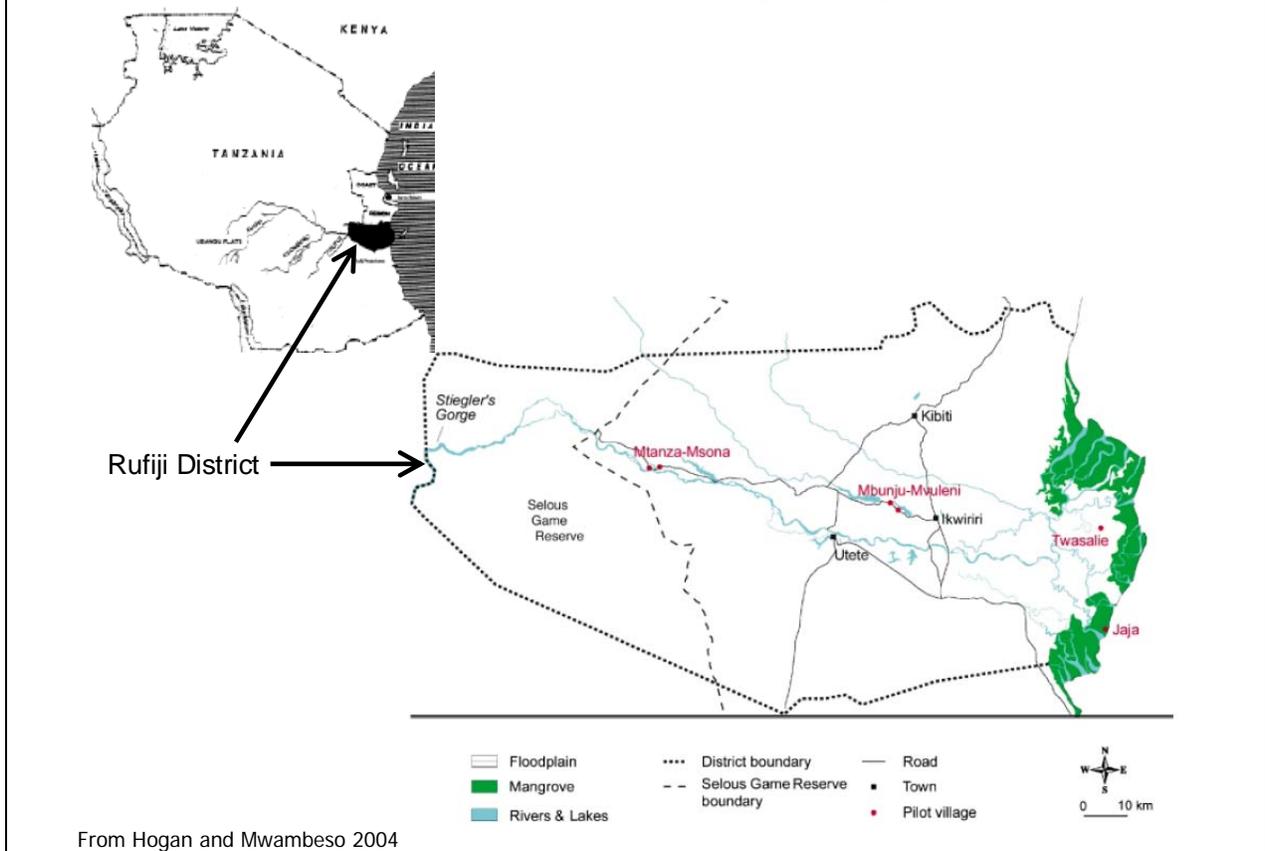
Wetlands in Tanzania, like many places in the world, have diverse, interrelated environmental and human values that are often poorly reflected in conservation and development planning. Efforts to achieve sustainable, effective and equitable wetlands conservation and management can be enhanced by a thorough understanding of relationships between their biodiversity, economic, and livelihoods dimensions. This, in turn, requires that wetlands assessments consider these dimensions in an integrated way. While there are techniques to assess wetland biological, economic and livelihood values and trends separately, there is a lack of available methods to assess the dynamics between them, or to express this information in a way that straightforwardly contributes to real-world conservation and development planning.

IUCN, International Union for Conservation of Nature,<sup>i</sup> and its partners have undertaken an extensive, integrated assessment of the biodiversity, livelihood and economic value of wetlands in Mtanza-Msona Village (Rufiji District, Tanzania). The assessment aimed to inventory the socio-economic conditions and wetland species and habitats within the village; to investigate what, how, when, why and by whom wetland resources are used; and to identify the implications of this use on wetland conservation status and the status of the local economy and livelihoods. The assessment was also meant to test the overall approach, and in so doing contribute to a larger international project – “Strengthening Pro-Poor Wetland Conservation Using Integrated Biodiversity and Livelihood Assessment” – which began in October 2005 and will conclude in September 2008, funded by the UK Darwin Initiative.<sup>ii</sup>

*The assessment clearly demonstrates that **wetlands support high species diversity, and make a significant contribution to livelihoods and economies in Mtanza-Msona, especially for poorer and more vulnerable groups.** The forests, woodlands, lakes, swamps, river and floodplain areas, and the plant and animal species they support, yield a wide range of products important to local livelihoods. The most poor and vulnerable groups within the Mtanza-Msona community rely particularly on wetlands resources for basic needs and wellbeing, and for mitigating vulnerability to seasonal or periodic shocks.*

The assessment also shows that many wetlands resources and species are threatened – most notably from upstream development and use – and that active conservation and management efforts are very limited. This implies the need for, *inter alia*, conservation and management plans that support sustainable utilization of wetlands resources by local people, particularly the most vulnerable. The integrated assessment can contribute to village and district level planning in line with these goals, and potentially help villagers express and defend the value of their resources against external threats. More generally, this approach can contribute to similar pro-poor conservation and development planning efforts throughout Tanzania and the world.

**Map 1: Location of Mtanza-Msona Village in Rufiji District**



## BACKGROUND

The Rufiji Floodplain of east-central Tanzania hosts high species diversity, and provides ecosystem services and products critical to local livelihoods and economies, but also faces a myriad of threats from unsustainable development and use. While there is some level of trade-off between managing wetlands for conservation and for human development needs, there are also positive synergies that should be drawn out. Understanding the nature and magnitude of the competition and synergies between natural and human systems in wetlands is an important step toward making plans and decisions that generate maximum benefits for both conservation and development.

In Mtanza-Msona Village in Rufiji District, IUCN has been collaborating with the Ministry of Natural Resources and Tourism, the District Council, the Village Government and local people, the Economic Research Bureau, the Institute of Resource Assessment and Department of Geography of the University of Dar es Salaam, and other partners to undertake an integrated, village-wide wetlands assessment. By linking biodiversity,

livelihood, and economic considerations, it aims, *inter alia*, to provide practical information for planning and decision making for sustainable, effective, and equitable wetland conservation. It is also one of two test cases in an international project - "Strengthening Pro-Poor Wetland Conservation Using Integrated Biodiversity and Livelihood Assessment" – which began in October 2005 and will conclude in September 2008 with funding from the UK Darwin Initiative.

## MTANZA-MSONA VILLAGE

Mtanza-Msona Village, located in the Rufiji Floodplain, was chosen as a pilot field site due to its rich wetland resources which yield a range of products which support local people's subsistence, income, and livelihoods. The estimated village area is between 550-600 km<sup>2</sup>, though its population is relatively compactly settled in five sub-villages, leaving a large area of forest to the northwest (Hogan *et al.* 2000). The assessment focused on all the wetlands within the village boundaries (permanent and seasonal rivers, streams, lakes, swamps and floodplains), including associated forest and grassland areas.

### ***The natural and human environments***

The Rufiji Floodplain has a tropical climate. Seasonality is mainly determined by rainfall and associated flooding, which play important roles in agricultural cycles. The village area natural habitats include forests, grasslands, bushlands, wetlands, sand dunes, farmland and areas of human settlement, which support high species diversity.

The village population of 1,830 people (428 households) is spread across four sub-villages. The largest tribe is Ndengereko (also known as Waruhingo). Others include Matumbi, Pogoro, Hehe, Ngindo and Zaramo. Local livelihoods are based around crop farming, with rice and maize as staples. While cultivation remains mainly at the subsistence level, food trading is a common way of generating cash income. Crop cultivation is also risky, and most households employ a range of additional livelihood and economic strategies to mitigate this risk. These include wild-food and medicinal plant collection, small-scale trade, charcoal production, fishing and handicraft production. The main energy source is fuelwood.

### ***Environmental governance and management***

The integrated assessment complements several ongoing wetland management processes. The wetlands and associated resources in Mtanza-Msona are in a mix of formally gazetted reserves, communal lands, and privately held lands, which are in turn managed by a mix of line ministries, local authorities (most notably the Village Council and Village Environment Committee), informal groups, and individuals. The local administration is ultimately responsible for land allocation and planning within the village. The Village Council also plays an important role in forest management, particularly in a village-gazetted forest reserve north of the Rufiji River. A village planning team prepared the Mtanza-Msona Village Environment Management Plan (VEMP) in 2000. The VEMP is being implemented by the Village Government, with the primary objective of protecting and ensuring sustainable utilization of the village area natural resources and environment. The Village Environment Committee drafted new rules for natural areas and resources use which became operational in August 2003; some rules mirror existing national laws, and others were enacted as Village Government by-laws.

### **THE PROCESS: SETTING OBJECTIVES, CONDUCTING THE ASSESSMENT, SHARING ANALYSIS**

The integrated wetlands assessment method in Mtanza-Msona was refined and adapted from the associated toolkit being produced as part of the larger project (Darwall *et al.* 2007), which sets the following guiding principles:

- Be integrated across disciplines and themes;
- Be geared to address a particular management issue or question;
- Generate information that can be used to support and improve the planning of on-the-ground wetland management, and provide information to make better decisions about how to use and allocate investment funds, land and resources in and around wetlands;
- Work to strengthen existing wetland management process;
- Serve to sustain wetland values, with a focus on ensuring the continued generation and equitable access to wetland goods and services, particularly for poorer and more vulnerable human groups.

The assessment followed three broad phases, described in turn below.

- (1) Defining management objectives** that recognise and balance conservation and development goals, and promote a pro-poor approach to wetland management.

This phase ensures that the assessment addresses a particular management or policy need. Wetland assessment is a means to an end — better and more informed conservation and development decision-making. The Mtanza-Msona assessment aimed to assist in wetland conservation planning and management by helping to address a lack of information about wetland status and values in the village. The study also aimed to identify the specific needs and status of the poor in Mtanza-Msona, and their links to wetland ecology and biology within broader livelihood and economic processes. The overall management objective was to generate information to inform planning and implementation of on-the-ground wetland management activities in the village, including the VEMP, and more generally to advocate for broader support of integrated assessment from the government and donors.

**(2) Conducting the assessment** to document the state of wetland biodiversity, identify development and conservation pressures and threats, and understand management and policy responses.

An interdisciplinary field team of biologists, ecologists, rural sociologists and economists carried out the main field assessment in two stages: during the dry season (September-October 2006) and the wet season (February-March 2007). Six wetland sites were surveyed and 3 focus group discussions were held for the biodiversity assessment (flora and fauna); 112 households were interviewed and 12 focus group discussions were held for both livelihood and economic valuation exercises. Detail was collected on species diversity and resource harvest and utilization, including when, at what levels, how, and by whom these activities are carried out, and what their economic value is at household and village levels. To promote integration, each of the inter-

disciplinary experts was involved in collecting and discussing information relating to all three thematic areas. There was also ongoing interaction with local government authorities and villagers to ensure a continuous stakeholder feedback loop.

**(3) Carrying out analysis and presentation** to emphasise the connectivity between biodiversity, economic and livelihood factors, and to ensure that information is presented in a practical and policy-relevant form.

Extensive data analysis and report drafting followed assessment completion, and several corresponding activities were used to present findings and solicit feedback from local and national partners, including trainings on integrated wetland assessment and analysis, awareness and information briefs, and national policy roundtables and local dialogues. A final series of national and local dialogues will be held to disseminate and share the technical report with stakeholders by September 2008.



*(Above) From left, a Village Forest Officer, the Village Game Scout, and the Integrated Assessment Biodiversity Fieldworker working together on the assessment. (© David Allen 2007)*

## KEY FINDINGS

- **All households in Mtanza-Msona use a variety of wetland resources to support their day-to-day livelihoods.** Every household engages in at least one wetland activity, and an average of 7 activities. Wetland resources form a major source of domestic energy, shelter, medicines and food for most people.
- **Wetland resources are of substantial economic value to households and the village as a whole.** The majority of wetlands harvest and use activities are worth at least TSh 25,000 a year for each person engaging in them, with timber harvesting for sale, fishing, honey collection, building poles and firewood being the most lucrative (average annual values exceeding TSh 100,000). The total annual value of wetland resource use is TSh 226 million (528,353 per household, 123,571 per capita) though this estimate increases substantially when considering real values, including broader linkages and multiplier effects.<sup>iii</sup>
- **Differentiation in the type and level of wetland activities across richer and poorer households demonstrate that, *inter alia*, the poorest households carry out a wider range of wetland activities,** in part to spread risk and maximise available opportunities. The participation of the poorest in wetland activities is however most often focused on meeting basic needs, and on relatively lower-value activities. Richer households tend to engage in both subsistence activities and activities for income-generation (e.g., pottery, wild honey harvesting, fishing, timber felling, and charcoal production), because they can afford the labour, time and equipment to do so.
- **The village area wetlands support a high level of species diversity, with very limited conservation and active management.** There are, to local people's credit, village-implemented fisheries controls (closed seasons on Lake Mtanza and Makoge, and limits on fishing gear and practices allowed) and forest conservation zoning.
- **Village area wetland habitats and species face 'off-site' and 'on-site' threats.** The main 'off-site' threats include upstream alteration of water flow cycles, such as through construction of dams and water extraction for irrigation purposes, and the potential arrival of invasive alien species. The main on-site threats include degradation/modification of wetlands for cultivation, over-exploitation of species (e.g. use of small-mesh size nets for lake/river fishing) and pollution.

Wetland activity or product	Energy	Medicine	Shelter	Food	Equipment & tools	Cash income
Fishing				✓		✓
Woodfuel	✓					✓
Timber			✓		✓	✓
Grasses, reeds & palms			✓		✓	✓
Medicinal & aromatic plants		✓				✓
Wild food plants				✓		✓
Hunting & animal-based foods				✓		✓
Wild honey & beeswax				✓	✓	✓
Clay					✓	✓

## CONCLUSIONS AND MANAGEMENT IMPLICATIONS

**From the findings above, we can conclude that, *inter alia*:**

- Wetlands underpin the quality and security of people's livelihoods and improve their living circumstances, especially for the poor.
- The vast majority of village economic activities depend directly or indirectly on wetland goods and services.
- Several critical species require greater conservation measures to ensure their continued existence, and sustainable availability in support of local livelihoods.

**Management implications include the following:**

- More and stronger conservation management plans are needed for key species, together with effective community education and species protection implementation policies that seek the participation of villagers.
- These management plans need to be coupled with policies and activities that directly benefit local people for conservation efforts, and that otherwise off-set the opportunity costs of restricted and modified resources use within the village area.
- Conservation measures need to ensure equitable impacts, including through careful consideration of impacts on the poorest or most vulnerable groups in the village (who are also the most directly dependent on wetlands resources for basic needs and wellbeing).
- Conservation plans also need to operate at multiple levels to address both 'off-site' and on-site threats, e.g., by using an Environmental Flows framework where the ecosystem approach is followed and the needs of people and the environment are equally considered.
- More information should be collected on the environmental requirements of the wetland species, and their importance to village livelihoods and economies, to ensure that impacts of use and external actions can be fully assessed and considered in the evaluation of future developments.



*A fisherman in Mtanza-Msona selling his catch from the Rufiji River to the village campground kitchen. (©Jessica Campese 2008)*

## POSSIBLE BENEFITS FROM THE ASSESSMENT PROCESS AND OUTCOMES

Information provided by the assessment, and the process itself, can benefit Mtanza-Msona, and Tanzania more generally, in several ways going forward.

- **Contribution to local conservation and development planning, including VEMP implementation:** The VEMP aims to secure and enhance wetland benefits for the local population, and to support pro-poor sustainable development processes through wetland conservation. Assessment outcomes further demonstrate the importance of the VEMP, and can contribute to its implementation by providing information about the nature and magnitude of the trade-offs and synergies between wetlands-linked biodiversity, livelihoods and economies.
- **Increased capacity to defend local resources, and thus livelihoods, from upstream development threats:** The Village Government and people of Mtanza-Msona have had limited capacity to express and defend the value of their local resources against harmful upstream developments, e.g., a proposed hydroelectric dam at Stiegler's Gorge. The information from the assessment – showing high, tangible, and diverse wetlands values – can contribute to local capacity to advocate against such upstream activities, and for continued rights to sustainable use of critical local resources.
- **Enhanced capacity to capitalize on village resources:** For a number of reasons, including lack of market access, villagers in Mtanza-Msona also lack adequate means to sustainably develop and fully capitalize on village area resources. In discussing the assessment findings about the value of local resources, villagers generated several ideas about how these resources might be capitalized upon in more effective and sustainable ways (e.g., expanded ecotourism development). Some of these village-generated suggestions may now be taken up by other local and partner-supported activities.
- **Opportunity to utilize integrated assessment tools in other wetlands:** Drawing on the lessons learned and interest generated by pilot activities in Mtanza-Msona, there are several developing opportunities to further adapt the assessment approach to the Tanzanian context, and to use the resulting adapted tools in local wetlands management and environmental planning activities in other locations in Tanzania. IUCN is collaborating with local, national, and international partners, including the Wetlands Unit, Wildlife Division of the Ministry of Natural Resources and Tourism; and the National Wetlands Working Group (NWWG) to actively pursue these opportunities. Institutionalizing integrated assessment across Tanzanian wetlands can contribute to broader efforts undertaken through the Sustainable Wetlands Management Programme (SWMP), which emphasizes decentralized natural resources management, and can serve as a model for similar approaches elsewhere in the world.

## REFERENCES

Darwall, W., Emerton, L., Allison, E., McIvor, A., and C. Bambaradeniya, C., (2007). *A Draft Toolkit for Integrated Wetland Assessment*. Freshwater Biodiversity Assessment Programme, World Conservation Union (IUCN), Cambridge.

Hogan, R. and Mwambeso, P.A., (2004). *Mtanza-Msona Village: Our Village Environmental Management Plan – An Account of How We Drew it Up and Are Implementing It*. Rufiji Environmental Management Project, IUCN Tanzania Country Office, Dar es Salaam.

Hogan, R., Mwambeso, P., Chirwa, E., Chande, M., Nandi R. and Mmbaga, N. (2000). *“We are all poor here”: Some Socio-economic Observations on Rufiji Floodplain and Delta*. Technical Report No. 3. Rufiji Environmental Management Project, IUCN Tanzania Country Office, Dar es Salaam.

Kasthala, G., Hepelwa, A., Hamiss, H., Kwayu, E., Emerton L., Springate-Baginski, O., Allen, D., and Darwall, W., (2008). *An integrated assessment of the biodiversity, livelihood, and economic value of wetlands in Mtanza-Msona Village, Tanzania*, International Union for the Conservation of Nature, *in print*.

**COVER PHOTO:** © Gita Kasthala

## NOTES

---

<sup>i</sup> The project is led by the IUCN Species Programme's Freshwater Biodiversity Unit, with project partners from the Overseas Development Group (University of East Anglia, UK), IUCN Tanzania, the IUCN Eastern Africa Regional Office, IUCN Sri Lanka, IUCN Cambodia, and IUCN Vietnam,. See: [http://www.iucn.org/themes/ssc/our\\_work/freshwater/darwin\\_index.htm](http://www.iucn.org/themes/ssc/our_work/freshwater/darwin_index.htm)

<sup>ii</sup> For more on the UK government Darwin Initiative, see: <http://www.darwin.gov.uk/>

<sup>iii</sup> Many more people than harvesters alone use, consume and depend on wetland products which may be made or collected by others to generate or support their sources of subsistence, income and employment. On average, wetland products are worth almost as much again as all other sources of farm production and off-farm income for user households.

For more information on the Mtanza-Msona integrated assessment or the Darwin Initiative project please contact:

Ms. Jessica Campese  
National Project Coordinator  
IUCN Tanzania Office  
63/1 Galu Street  
Ada Estate, Kinondoni  
PO Box 13513  
Dar es Salaam  
Tanzania

Tel: +255 (0)266 9084 / 9085  
E-mail: [jesscampese@gmail.com](mailto:jesscampese@gmail.com)

Dr William Darwall  
Coordinator, Freshwater Biodiversity Unit  
IUCN Species Programme  
219c Huntington Road  
Cambridge CB3 0DL. UK

Tel: +44 1223 277966  
Fax +44 1223 277845  
E-mail: [William.darwall@iucn.org](mailto:William.darwall@iucn.org)

Integrated wetland assessment project website:  
[http://www.iucn.org/themes/ssc/our\\_work/freshwater/darwin\\_index.htm](http://www.iucn.org/themes/ssc/our_work/freshwater/darwin_index.htm)