Case study: Ga-Mampa wetland, South Africa

Reed-bed wetland in a rural setting

The Ga-Mampa wetland is a palustrine wetland in a steep-sided valley adjacent to the Mohlapitsi River, a tributary of the Olifants River in South Africa (Figure 1). It consists predominantly of reed beds *(Phragmites mauritanus)* and scattered open water, and covers an area of approximately one square kilometer (km^2). The immediate surrounding area is farmland, with five villages located in the valley bottom close to the wetland. An irrigation system located to the north and west of the wetland takes water from the Mohlapitsi River upstream of the wetland. The catchment, with an area of 490 km^2 is mainly rural, with relatively natural grassland vegetation contained within two nature reserves (Lekgalameetse Provincial Park and Wolkberg Wilderness Area).

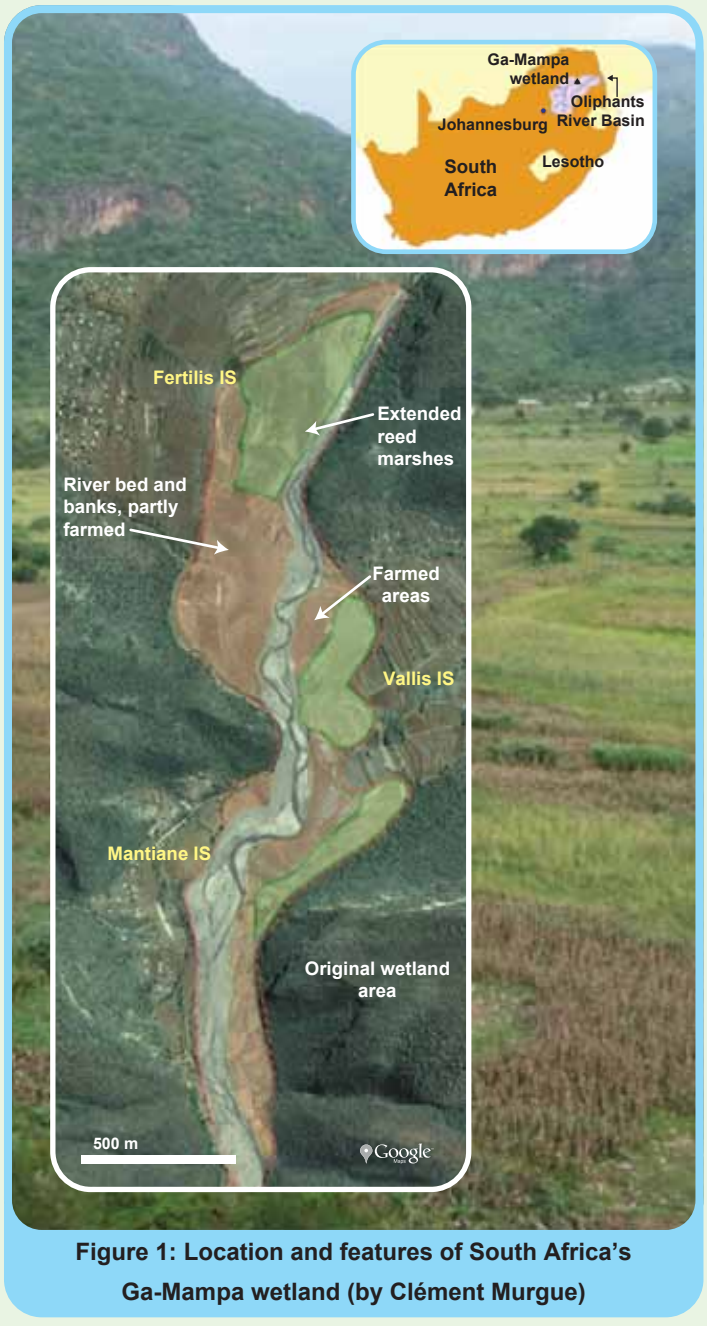

Figure 1: Location and features of South Africa's Ga-Mampa wetland (by Clément Murgue)

Involving the local community in wetland management

The main stakeholders in the wetland are the local community, with a population of 2,580 in five villages. The community stakeholders include the Community Development Forum and its thematic committees, the traditional authorities and the ward councilor. The community uses the wetland for a range of purposes including grazing, collecting reeds and cultivation. Other stakeholders include sector departments at municipal, provincial and national levels (agriculture, environment, water, economic development, tourism); University of Limpopo and its Centre for Rural Community Empowerment (CRCE); and the South African National Biodiversity Institute in charge of the Working for Wetlands Programme.

Stakeholders were involved in the planning process through a series of meetings and workshops. In some cases, a role-playing game was used to structure discussions. Input from stakeholders was used in three main ways: to identify and refine management solutions; to reveal stakeholder priorities and perceptions; and to select indicators and qualitatively score potential management solutions.

The wetland's ecosystem services and uses

The wetland supports important ecosystem services, including providing water, carbon storage and natural resources (grass for livestock grazing, and reeds and sedges for making crafts) (Figure 2, over page). Although cultivation within the wetland began several decades ago, it was expanded only after the year 2000, following severe floods. These damaged the small-scale irrigation infrastructure on which local people depended and slightly modified the drainage within the wetland, making agriculture more feasible (as a result of scouring and a slight shift in the riverbed). Part of the irrigation system was repaired in 2006, with rehabilitation ongoing. However, in the intervening years, the wetland was increasingly utilized for agriculture and shrank from 0.96 km^2 in 1996 to 0.43 km^2 in 2004. As the crops grown in the wetland (predominantly maize) do not do well in saturated conditions, farmers have dug a large number of channels in an attempt to drain the wetland soils. Moderate to heavy grazing of livestock takes place in the areas of natural vegetation.

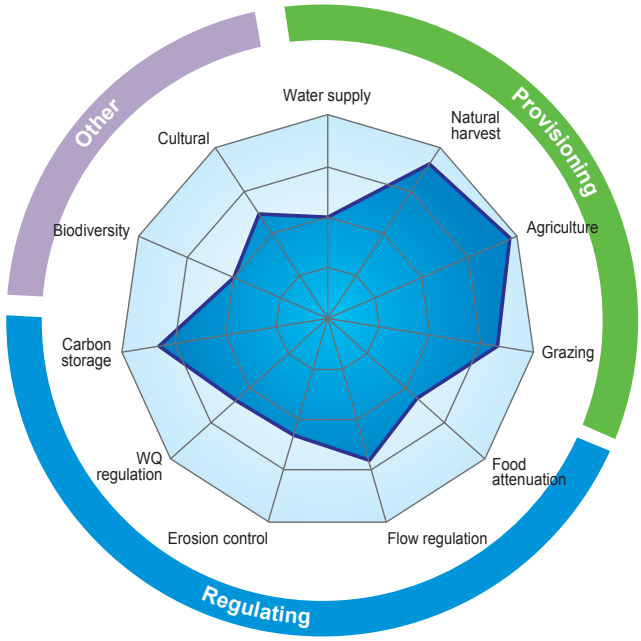

Figure 2: Ecosystem services provided by the Ga-Mampa wetland

Poor management has degraded the wetland

The main management issues relate to increased cropping and grazing in the wetland, and degradation of the wetland due to management practices (artificial drainage, active tillage, uncontrolled grazing of cattle and rapid erosion of the riverbank). There are potential trade-offs in wetland use: between agricultural use and conserving natural biodiversity and traditional uses of the wetland; between livestock grazing and cultivation; and between individual and community interests (Figure 3).

The governance context of the wetland is complicated by changes in the institutional framework accompanying the end of apartheid. Under the old regime, agriculture was controlled and access to resources was regulated. There has been a change to community-based management but without proper handover, so there is an institutional void in natural resource management (NRM). Traditional authorities are still officially responsible for managing communal lands but they have lost their authority. Local governments (municipality, province) are preoccupied with infrastructure and economic development, and hence conservation and NRM have been given a low priority.

Options for managing the wetland include:

- rehabilitation of the irrigation schemes, through full commercial farming using drip irrigation; a community-led renovation of the existing gravity irrigation; or an integrated approach including elements of both;
- sustainable wetland farming practices, including wetland-adapted crops, long-term fallow periods, use of animal manure and vegetal inputs, and management of erosion through the use of crop residues;
- land use planning: zoning and rotation practices, with a range of options from 35% to 75% natural area in the wetland, with and without rotation practices; and
- ecotourism activities through partnership with an existing semi-government entity.

Other options identified as prerequisites to better management include improving road access and network coverage; establishing appropriate local resources management institutions; integrating wetland management in local development planning; and improving implementation of legislation at local level. Different combinations of these components were packaged into management 'solutions' with different emphasis on conservation, economic development and social development (Figure 4). Eight solutions were evaluated, including a 'business-as-usual' option.

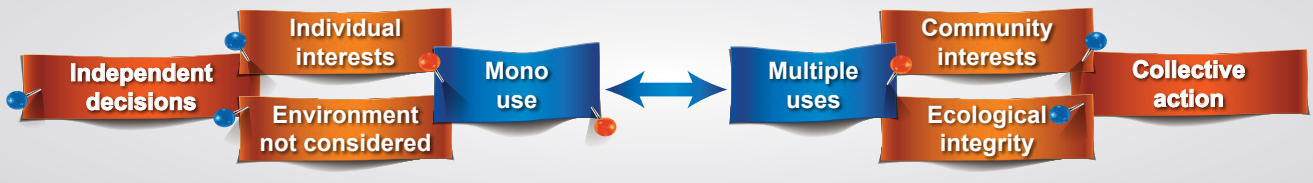

Figure 3:
Potential trade-offs in the use of the Ga-Mampa wetland (by Clément Murgue)

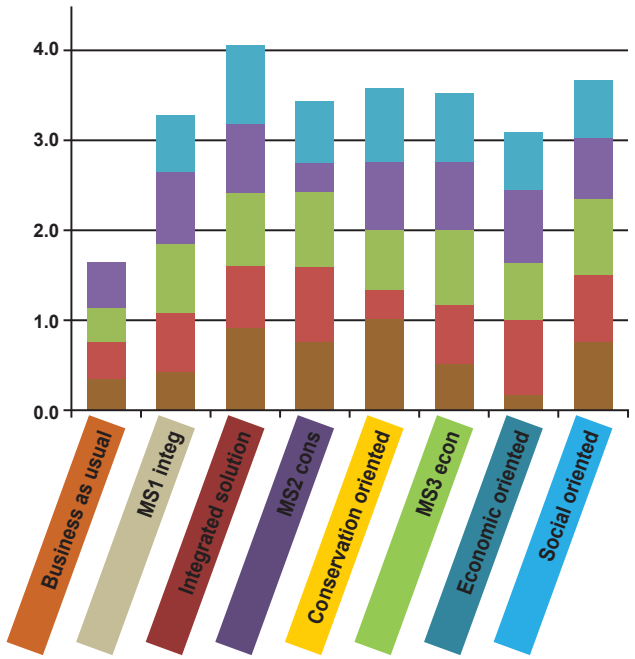

Figure 4: Scoring potential management solutions

Evaluating the potential management solutions

A preliminary evaluation was made based on the qualitative expert scoring of a broad range of indicators regrouped in five classes; the integrated solution scored best using raw scores.

The Ga-Mampa wetland provides water and natural resources for making crafts

When scores were weighted to reflect priorities expressed by different stakeholders, the integrated option still got the highest score, but the ranking of other solutions changed (Figure 5). The strength of the approach was not in the rankings resulting from the analysis, but in the participatory process of exploration, debate and negotiation with stakeholders, used to derive them.

Recommendations for managing the wetland in future

The participatory multi-criteria analysis of wetland management options conducted in the Ga-Mampa wetland allowed initiating and strengthening dialogue between very diverse stakeholders, from local farmers to staff members of sector departments at municipal and provincial levels up to representatives from conservation organizations at national level. The exercise also provided material for decision makers in the form of a diagnosis of stakes and challenges, and documented management options and solutions adapted to the local situation and validated by stakeholders.

Stakeholder	Solutions order (best →worst)							
Group 1	integ	soc	MS 2	cons	MS 3	MS 1	Econ	BAU
	86	80	79	79	70	61	56	32
Group 2	integ	soc	cons	MS 2	MS 3	MS 1	Econ	BAU
	84	79	77	74	67	62	54	28
Group 3	integ	soc	MS 2	cons	MS 1	MS 3	Econ	BAU
	82	80	77	70	66	65	59	40
SH 3 (Ward council)	integ	cons	MS 2	soc	MS 3	MS 1	Econ	BAU
	84	80	78	78	69	59	51	32
SH 6 (LDA municipal)	integ	soc	MS 2	cons	MS 3	MS 1	Econ	BAU
	83	80	76	73	68	64	57	30
SH 11 (LEDET)	integ	cons	soc	MS 3	MS 2	MS 1	Econ	BAU
	86	81	79	75	74	58	58	30
SH 16 (AIR)	MS 2	soc	integ	MS 1	Econ	MS 3	cons	BAU
	82	81	77	68	67	66	56	38

Figure 5: Weighted ranking of the potential management solutions

Because of the cognitive complexity of the exercise, the process did not find a solution accepted by all stakeholders; further work is needed to reach this stage and develop a functional management plan. Nevertheless, the process itself was useful as it made external stakeholders aware of the complexity of local natural resources management issues, and provided information to local farmers to help them build their own project. In this endeavor, feasibility of solutions should be considered carefully.

The difficulties in finding a compromise solution suggest that the process needs to be simpler, with fewer criteria for multi-criteria analysis. Sound information on management options and better communication of research results to all stakeholders, in a format adapted to various audiences, are crucial.

Research made it clear to all stakeholders that because the origin of wetland management problems lay outside of the wetland, it is necessary to consider management of the resources of the Ga-Mampa Valley as a whole. Rehabilitation of irrigation systems is, therefore, at the core of all proposed management solutions. In order to support the further process of management solution elicitation, we recommend the following:

- whenever technical, economic or institutional changes are considered, a flexible approach is recommended, allowing for progressive adoption, and accounting for the diversity of the situations and objectives of the farmers;
- stakeholders at all levels should be continuously involved. CRCE seems the most appropriate organization to engage with stakeholders in the long run, and to use research results and help develop and implement a wetland management plan;
- when rehabilitating irrigation schemes, a business plan is needed based on observed achievements of similar projects;
- if drip irrigation is finally chosen as the technical alternative for rehabilitation of irrigation schemes, a pilot project with a small group of volunteer farmers would be recommended before extending it to the entire valley; and
- additional research on sustainable wetland farming, including monitoring of present practices and results (yields, economic returns), observation of practices in other sites and implementation of on-farm trials.

Technical solutions alone will not solve the management problems of the Ga-Mampa Wetland. Institutional empowerment and stimulation of collective action is necessary to achieve a balance between private use of the wetland for cropping and communal multiple uses. This entails assisting the local community in decision-making and long-term capacity building.

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About WETwin

The WETwin project aims to enhance the role of wetlands in integrated water resources management for twinned river basins in the European Union (EU), Africa and South America in support of EU water initiatives. The objective is to improve community service functions while conserving good ecological status.

Partners

VITUKI Environmental and Water Management Research Institute, Hungary (coordinating partner)
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Antea Group, Belgium
Potsdam Institute for Climate Impact Research, Germany
WasserCluster Lunz, Austria
UNESCO-IHE Institute for Water Education, the Netherlands
National Water and Sewerage Corporation, Uganda
International Water Management Institute, South Africa
Escuela Superior Politécnica del Litoral, Ecuador

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Factsheet topics

1: Lessons learned from a comparative assessment
2: Enhancing governance in wetland management
3: Devising a Decision Support Framework
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