

Section III

Responses and guidance

This section focuses on responses and on the ways to move towards guidance. Chapter 9 explores in greater depth than Chapter 3 the response experience in the case database, identifying specific clusters of similar responses and key variables that can affect response development and implementation. Chapter 10 reflects on the experience exposed by the analysis in this report and identifies both potential areas in which to develop responses as well as key areas where further information and conceptual development are needed.

Chapter 9

Response scenarios

Chapter 3 provided an initial review of the DPSIR data concerning responses. The data used in Chapter 3 were aggregated from the database. This obscured the fact that most individual cases have multiple actors and multiple responses, and with one or more DPSI elements being addressed. A somewhat fuller discussion of responses has been given in the relevant sections of Chapters 4–8 for the specific cases reported in detail there. This chapter presents a more holistic approach to the responses of all the database cases, recognizing that they have these three constituent parts (actors, response mechanism, and DPSI element addressed) and that these interact. Hence, it is better to conceptualize a response as being a combination of parts, or a scenario. Moreover, response scenarios are situation-specific, or context-specific, with particular facilitating or constricting circumstances. Having a favourable context, as well as involving appropriate actors and addressing the relevant DPSI elements sensitively, is vital for responses to be able to address effectively the negative aspects of AWIs and to facilitate, or promote, positive measures.

The focus in this chapter is on identifying types of response scenarios that have been implemented and that appear to help achieve a better balance between provisioning and regulating services in wetlands. While it is possible to identify the characteristics of the responses used, it is more difficult to judge the degree to which they were successful in meeting their goals as the data are limited. Nonetheless, this chapter provides an exploration of responses that have been used in different situations and so provides some ideas to be developed in the next stage of the GAWI work.

RESPONSES IN THE CONTEXT OF THE DPSIR ANALYSIS

The DPSIR model has shown links between:

- drivers of change;
- pressures that lead to state changes;
- state changes that can undermine regulating and provisioning services;
- impacts of various socio-economic dimensions, including provisioning services and conflicts.

In addition, there are numerous feedback mechanisms that often reinforce changes.

The analysis in Chapter 3 shows that the bulk of the responses are on the state-change element, and then on the impacts and pressures identified in the DPSIR analysis. This suggests that, for the most part, the responses are coping mechanisms, trying to address the symptoms of the situation rather than focusing on the underlying drivers creating the AWI situations. To some extent, this is to be expected as the immediate “problems” can be identified and can more easily elicit responses in a wetland site, river basin or coastal situation, rather than trying to change the international terms of trade, government policies, or poverty that have been driving the use of wetlands for agricultural purposes to the level where negative consequences result. Hence, an initial

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point is that there is a need to pay more attention to addressing the drivers of change in the bigger picture and seeking to redirect drivers to produce more beneficial AWIs where the balance between provisioning and other services (regulating, cultural and support) is achieved.

Linked to this, it is also important to propose that a response scenario should consider all elements in the AWI situation, as identified by the DPSIR analysis, so that the results from the drivers, in terms of pressures, state changes and impacts, and the feedback mechanisms that they set up, can be addressed. Given that there is often a need to address the situation quickly, it is understandable that ameliorating the negative aspects of state changes and pressures be considered first, rather than waiting for policy-level work to feed through to address the drivers. However, such action tends to be palliative rather than to address the root causes.

Further reflections on the findings in Chapter 3 suggest that it is important to note that the socio-economic impacts, in terms of livelihoods and poverty, need to be given attention at the same time as the biophysical state changes are being addressed. The conflicts that can be created between interest groups through agricultural development in wetlands, especially in less developed countries where marginalization may occur, must be addressed to prevent them escalating and to help create a socio-economic basis for sustainability. In particular, agriculture cannot simply be displaced or greatly reduced without consideration of alternative incomes or livelihoods.

Given the complex and multidimensional nature of responses, it is important to involve all stakeholders, as they may have different roles to play with respect to different DPSIR elements. An inclusive and participatory approach is needed, giving the different stakeholders a forum in which conflicts can be resolved, an opportunity to contribute to wetland management decisions, and ownership over the measures to be applied.

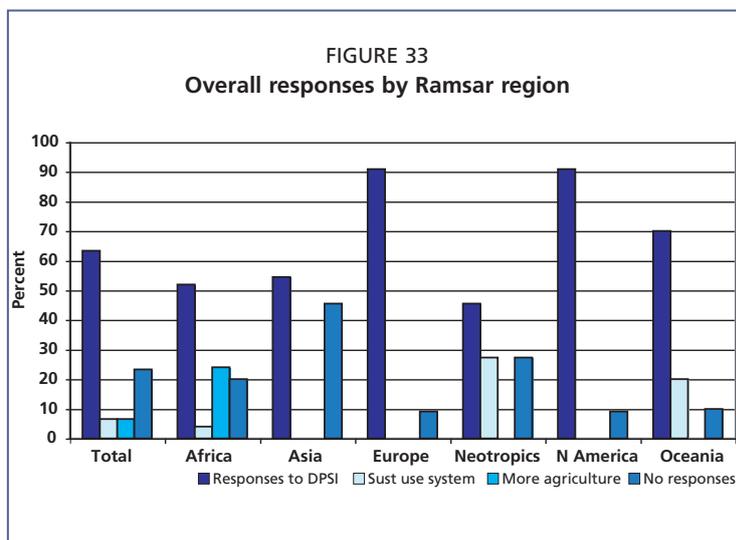
CHARACTERISTICS OF RESPONSE SCENARIOS

In order to analyse the response scenarios, all 90 cases were studied separately (Figure 33).

Almost 63 percent of the cases have responses of some sort attempting to address the DPSI elements of the AWI situations, while 24 percent have no responses reported, or only have proposals for responses. In addition, almost 7 percent show some evidence of an established sustainable-use regime, usually because of a low-intensity and subsistence form of agricultural use. In contrast, there is evidence of ongoing and increasing agricultural exploitation in almost 7 percent of the cases, without any explicit reference to

the need for responses to address negative aspects of this situation where these occur.

The regional analysis of these data shows that the highest level of response was in the cases from Europe, North America and to a slightly lesser degree Oceania, with the lowest rates of response in the Neotropics. This is partly a reflection of the cases that were obtained, and the degree of reporting on responses. However, it is also a reflection of the different levels of awareness of AWI situations and prioritization of these issues relative to other

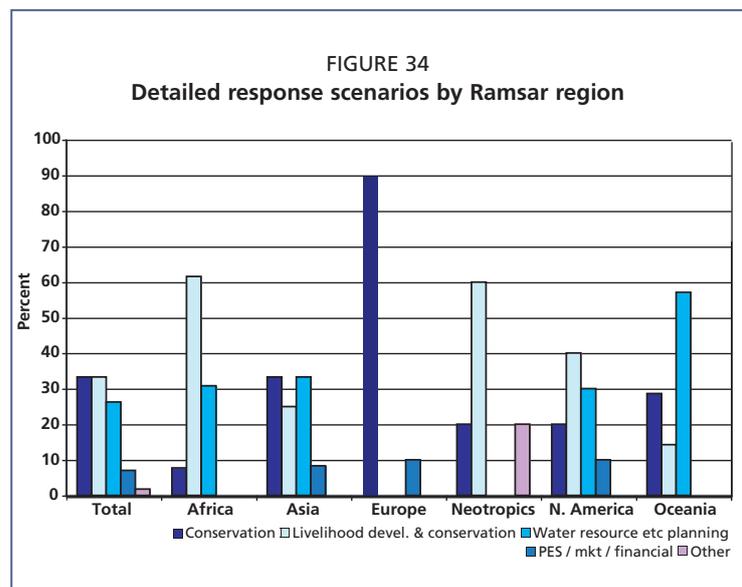


considerations (such as poverty and economic growth), and the differences in the resources available to address AWI issues. The relatively recent development of pressures on wetlands in Africa is reflected in the fact that this is the only region with cases that show responses to include increased agricultural development of wetlands, irrespective of sustainability and environmental issues. Existing sustainable wetland-use systems refer to systems that are of long-standing and where no pressures are reported to exist. These are mostly found in the less developed countries, especially the Neotropics, Oceania (Papua New Guinea and Micronesia) and Africa.

Where there were responses, these were analysed using the initial DPSIR data presented in Chapter 3 and additional information from the checklists. These were then grouped into four scenarios that had some commonality of approach, focusing on: (i) biodiversity conservation; (ii) water resource management; (iii) balancing of conservation and sustainable livelihood development; and (iv) developing market / financial mechanisms. While these categories are not exclusive, and there are considerable variations within the groups, some generic characteristics can be identified for each, as explained below.

Figure 34 shows that there are two leading response scenarios: Conservation; and Livelihood Development and Conservation. The Conservation scenario group (33 percent) includes various cases where protecting or enhancing the natural state of the wetlands, or the human-created biodiversity and/or landscape of a wetland is sought (as with fen meadows and inland fish ponds in the latter case). In most cases, such action is led by the state, with or without some degree of involvement by a local or international NGO, and with varying degrees of community engagement. Some of these cases include the development of ecotourism to create new economic drivers, but this is not explicitly stated in most of these cases. The majority of these cases involve the creation of new drivers, such as incentives for land-use changes and land management practices, state purchase of land for conservation, legislation about the protected status of an area, or the removal of subsidies that had encouraged wetlands cultivation and drainage. In some cases, there are incentives through increased income from ecotourism, or harvesting / fishing / shooting benefits, although these three benefits are more common in the following scenario. Specific technical measures are also common where rehabilitation occurs to address state changes and to reduce pressures. Where displacement of people occurs, responses to address negative socio-economic impacts are also reported, such as alternative income opportunity development.

The Livelihood Development and Conservation scenario group (33 percent) includes cases where there are combinations of conservation/rehabilitation of wetlands or parts of them, with measures to address the livelihoods of communities using wetlands, across a range of market orientations. In these cases, a balance is sought in wetland land use in terms of provisioning and other ecosystem services, and sometimes in terms of the distribution of benefits among stakeholders. One-quarter of the cases in this group (five – eight percent overall) explicitly try to address wetlands and their



catchments in an integrated manner. This approach seeks to improve the environmental, and especially hydrological, functioning of the system and to produce a better-functioning landscape without the alienation of wetlands from the community for conservation use alone. It also seeks to improve the sustainability of agricultural land use in the catchments and in the wetlands. This is sometimes referred to as a “functional landscape approach”. These cases are typically led by local and international NGOs working with community participation and may involve NGO–government collaboration. There are often specific technical measures to address state changes caused by management practices in the wetlands and catchments, as well as to support the generation of income benefits from semi-conserved wetlands, through fishing, reed-based crafts, and duck shooting. In some cases, these initiatives may involve clarification of community rights to wetlands in order to reduce excessive exploitation caused by open access and to encourage communities to manage wetland resources more effectively.

The third scenario group is Water Resources and River Basin Planning (26.3 percent). This involves a focus on the hydrological system, usually a river basin. As such, it addresses the larger spatial units, rather than individual wetland sites (and catchment) and *in situ* management – which are often the focus in the above two response scenarios. The water resources approach attempts to introduce innovations to manage a river basin in a way that recognizes the multiple stakeholders, the need for efficient use of water, and the importance of environmental flows. These responses are usually led by the state, but with varying degrees of community participation – generally more so in high-income countries. They involve different degrees of rebalancing of water allocations so that in some way the natural hydrological regime prior to agricultural interventions can be replicated to better meet the needs of nature, including wetlands. This response scenario usually includes legislative and institutional development measures to establish management organizations, as well as water allocation arrangements to achieve a more balanced use of water, often with financial incentives to encourage more efficient use. Technical measures are often applied in these cases with respect to water use.

The last specific scenario group is Payment for Environmental Services / Financial / Market Mechanisms (5 percent). It includes three cases where there are a range of financial mechanisms (charges, markets and incentives) that act as new drivers to influence land use and water management in wetlands and their catchments. The experience is difficult to generalize, and it could be argued that these cases should be included in some of the categories above. However, the evidence suggests that these cases involve recognition among stakeholders of the need for the ecosystem regulating and support services provided by wetlands to be better valued (or valued in new ways) and for payments to be made for these and so ensure improved management. To date, there is only one case of PES (for catchment management), one case of tradable water rights, and one case of incentives for land-use change in wetlands to meet environmental management goals (flood control) rather than conservation per se.

The regional distribution of these four groups shows that there are major variations by region, with the dominant approaches being: conservation in Europe; livelihood development and conservation in Africa, the Neotropics, and North America; and water resources management in Oceania. Asia shows the most balanced pattern of responses, with conservation and water resources management each accounting for one-third of responses, and livelihood development and conservation accounting for 25 percent (Figure 34).

These variations in responses probably reflect, in part, variations in socio-economic conditions. The richer countries of Europe (and New Zealand) are able to afford to pay for wetland conservation, or use financial mechanisms to achieve wetland land-use change. However, in many of the cases from Africa, the Neotropics and Asia, there is a need to focus on livelihood development in order to address poverty issues. The cases of sustainable livelihood development and conservation in North America are

due to the linkages between the duck lobby and farmers to create wetland conditions that can give increased benefits for ducks, farmers and hunters. Other important regional patterns are the importance of conservation in Asia (33 percent) and Oceania (29 percent), and water resources management in Oceania, North America, Asia and Africa (all more than 30 percent).

SPECIFIC CASES OF SUCCESSFUL RESPONSE SCENARIOS

In order to explore the different types of response scenarios and to identify the links between these and the circumstances that facilitate or constrain them, a number of cases of each type of response are briefly summarized in this section.

Conservation

Lake Kolleru, India

This appears to be an extreme case of removal by government agencies of non-conservation land uses (namely, about 12 500 ha of fish ponds) from the lake and its wetlands to encourage the return of migratory bird species after a 17-year absence. The reason for this was the designation of this lake as a wildlife sanctuary in 1999, as well as its role in balancing water flows between two delta systems. Some alternative land has been made available for a small percentage of the people displaced, while others have been given training opportunities for non-farming/non-fishing enterprises.

Drentse Aa, the Netherlands

Measures have been necessary to respond to the upwelling of polluted groundwater in the Drentse Aa's riverine wetlands in the Netherlands. This has involved using legislation to control pesticide and fertilizer use on farms in the upper valley, as well as the purchase of the lower valley area for use as a nature and cultural landscape conservation area (Chapter 5).

Lake Ellesmere, New Zealand

This coastal lagoon has been seriously affected by the development of commercial farming in the catchment. In particular, effluent entering the lagoon has negative cultural and spiritual implications for the local Maori population. There has also been a decline in local fish stocks, with potentially negative implication for tourism (fishing and duck hunting). Recognizing these negative developments and their implications, a trust was set up to articulate the views of local stakeholders and to develop a joint management plan with the Department of Conservation.

Uganda wetlands policy

Uganda has a strong wetlands policy that seeks to move the country from conversion to conservation. This goal has come about as the result of major destructive uses in wetlands, associated with rice cultivation and grazing, among other agricultural activities. While in the two cases from Uganda, both recognize the national wetlands policy and agree for the need to seek conservation, one specifically addresses the limits of this policy given the intensive agricultural use of wetlands. In this case, wetland conservation measures are applied only in limited areas, and mainly to prevent degradation caused by bank-side cultivation.

Livelihood development and conservation

Wetlands for ducks, the United States of America

Initiatives from an NGO, Ducks Unlimited (DU), in North America has sought to combine the interests of farmers and the duck conservation / hunting lobby in innovative ways. With respect to rice cultivation in the United States of America, DU is working with the Rice Growers Federation to develop hydrological regimes that suit

the ducks – stable winter water levels – and that allow the ducks to undertake weed control during their sojourn on the fallow rice fields. A similar balance of farmer and duck interests has been achieved in Lizard Marsh in Manitoba, Canada. Here, changes in the water management regime and hay-harvesting practices have allowed more hay to be obtained while higher water levels have been kept in parts of the marsh to allow the ducks to breed. Other wetland maintenance and rehabilitation activities in the United States of America have been facilitated through a combination of government policies that provide incentives, or drivers, for wetland maintenance. These are the Clean Water Act (which prevents the filling-in of wetlands) and the Food Security Act (which withholds payments to farmers who convert or modify wetlands).

Functional landscape approach, Africa

There are a number of cases of this approach in Africa, where field-based organizations, usually NGOs, work with communities to improve the livelihood benefits they can obtain from wetlands in a sustainable way and also to maintain the wider environmental functioning – of the catchment for the wetland, and of the wetland for downstream users. One of the most interesting cases is where a local NGO is working in collaboration with the Working for Wetlands Programme (of the South African government), which is trying to re-establish wetlands in order to improve the functioning of the national hydrological system. In another case, a local NGO in Ethiopia is involved in supporting communities to resist government policies that encourage complete wetland transformation, and instead are trying to generate a better balance of catchment and wetland farming that can maximize benefits from the overall natural resources base.

Esmeraldas Province, Ecuador

In response to extensive destruction of mangroves caused by immigrants engaged in fish pond production of shrimps and the negative impacts that this had upon the local gathering economy based on cockles, crabs and fishing, a mangrove reserve has been created. This has given clear rights to the local population and reduced the pressures on their economy. With donor project support, local mangrove committees have been developed to control the size of cockles collected and improve the long-term sustainability of their livelihoods.

Ganges Delta, Bangladesh

There has been involvement of government, NGOs, local community and international agencies in wetland conservation and development initiatives in recent years in degraded sites in the Ganges Delta. The approach combines traditional conservation, including the designation of Ramsar sites, with more bottom-up development approaches. The IUCN Bangladesh Country Office, in collaboration with Ministry of Environment and Forests, the United Nations Development Programme (UNDP) and three national NGOs, has implemented the “Community-based Haor and Floodplain Resource Management Project” in five degraded areas. Responses have focused on both capture and culture fisheries. More attention has recently been paid to developing rice–fish culture systems that are in tune with the flood–drought cycle and that do not seek to alter the environment yet improve household livelihoods.

Water resources and river basin planning

Environmental flows in Australia

As a result of increased environmental awareness in Australia, and especially the adoption of ecologically sustainable development by the government as a guiding principle in 1992, there has been increased awareness of the damage to wetlands as a result of irrigation water offtake disrupting river flows. Responses to this have been

seen in the development of community-based river/floodplain advisory committees or other institutions, with government and local stakeholder representation. Key outcomes have been attempts to improve the efficiency of irrigation water use in order to allow the retention of sufficient water for environmental flows that will to some extent replicate pre-irrigation hydrological flows. However, there are reports that there is sometimes a lack of commitment in government agencies to these goals, poor follow-up by government staff and conservation groups, and continued resistance from the irrigation industry.

Jewel Project, Hadejia-Nguru wetlands, northern Nigeria

River basin water resources planning and management was introduced more than 20 years ago in the Hadejia-Nguru wetlands in order to improve irrigation development in the area. However, poor design and maintenance led to sedimentation and weed buildup in the channels. This is now being addressed through a more participatory approach that is trying to create a hydrological system that also addresses the need for environmental flows to maintain wetlands as well as meeting irrigation needs.

River projects in Canada

In Canada, there is a long history of river management for irrigation and other commercial needs. With increased community awareness and interest in water management for environmental and recreation needs, new river management structures have been developed. These involve wider participation and include the needs of the environment and recreational groups in the formulation of water resources / river basin plans.

Market, PES and financial mechanisms

Deschutes River, the United States of America

Owing to shortages of water for farm irrigation and increasing recognition of the need for improved water quality for recreational activities (which could generate farm income), a community of local and regional stakeholders formed a not-for-profit river conservancy. Through this organization, they created a system of water rights that could be transferred or leased, allowing the holders of these rights to be compensated for not using their full allocation. They also developed target flows for habitat restoration and wildlife in order to meet recreational needs and develop tourism, with a view to diversifying farm income.

Bhoj Upper Lake, Bhopal, India

This is a collaborative programme involving an international non-governmental organization (INGO) working with the local government to fund catchment rehabilitation through voluntary contributions from the tourism industry. This seeks to create improvements to the lake and wetland ecology that will benefit the tourism operators and also improve the livelihoods of the catchment farmers.

RESPONSE SCENARIOS AND FACILITATING CIRCUMSTANCES

A key finding from studying the individual response scenarios is that, in most cases, there is a combination of country-specific or site-specific circumstances or factors that have made particular responses feasible or led to responses being implemented. (This is also seen in the detailed case studies in Section II.) These may relate to: public awareness and support; community motivation and local organization; government policies; national or international legislation; resources availability for actions with respect to wetlands; and pressures/interests from international agencies, INGOs, national or local NGOs, and interest groups.

The dominance of the “conservation” responses in Europe is very much influenced by EU legislation, especially in the cases from the new EU members. However, this builds

on national interest groups and legislation in many countries, with public concerns and national lobbies interested in wetlands, biodiversity and bird conservation. Ecotourism is mentioned in many of these cases as a way of generating additional funds to meet the opportunity costs of land-use change for wetland conservation or the maintenance of less-productive, but more ecologically desirable, uses. However, in most cases, the state is the major source of funding for land purchases for conservation, for payments to farmers (which redirect the drivers for wetland transformation and exploitation through agriculture towards conservation uses), and for technical measures applied to achieve conservation goals.

Conservation in other high-income countries, such as New Zealand and those of North America, is also the result of similar state, community and interest group actions, with state funding important. In the cases of conservation in lower-income countries, there is more involvement from INGOs or local NGOs in support of the state or even local communities. However, in India, the national government and state governments are reportedly funding directly some “rigorous” conservation measures in lake wetlands owing to recognition of their ecological importance. Similarly, in the United Republic of Tanzania, livestock have been “removed” from the Usangu wetlands for both conservation and water resources reasons.

In Africa, and other lower-income continents, the major responses are “Livelihood Development and Conservation” owing to the considerable and diverse uses made of wetlands by communities for provisioning services and the inability of the state or other agencies to displace large populations without political implications or major costs. In these cases, there is often a combination of local or international NGOs working with community-based initiatives, with varying degrees of government involvement. There are also cases of Livelihood Development and Conservation in North America, where DU is working with farmer groups to create win–win situations, where the benefits to farmers and interest groups coincide, and are in line with government policies and incentives that can contribute to these initiatives.

Water resources and river basin planning usually involves government leadership, but it may have different facilitating circumstances. In Australia, the government policy of ecologically sustainable development, combined with local wetland/conservation interest groups and concerns about water management in drought-affected areas, created conditions where discussions about re-establishing environmental flows were easily taken up. The same is true in some respects in Canada, but community interests, especially recreational concerns, have also been important in the cases there. In Asia and Africa, water resources planning has a strong livelihood/provisioning element, with the state trying to address the different interests as situations become more competitive.

The group of responses listed as “PES, Market and Financial” are very diverse, being found in the United States of America, the Netherlands and India. They appear to be the result of very different stimulating and facilitating circumstances – water shortages and farm income pressures, flooding and EU agricultural policy changes, and sedimentation/pollution, respectively. There are also different response initiators, these being communities, the state and an INGO. These represent new initiatives that require some innovative spark or set of circumstances to start their formulation. In the Netherlands, it was the coincidence of flood regulation with the change in the CAP policy; in Bhopal (India), links between community groups and an INGO; and in the United States of America, a combination of water resources shortages and pressures on farmers that could not be addressed in traditional ways.

CONCLUSIONS

In order to achieve sustainable AWIs, a better balance between provisioning and other ecosystem services in wetlands is needed. This requires reducing the pressures from provisioning services and increasing the role that the regulating, cultural and support

services play in the wetland. Analysis of the case database shows that four groups of response scenarios can be identified. While they have specific focuses, there is some overlap in several between the activities and actors involved in the different scenarios.

From the analysis of the response experience, some further conclusions beyond those reached in Chapter 3 can be identified. Combining the findings in these two chapters, it can be suggested that for responses to be effective they need to:

- include multiple elements that help address several or all elements of the DPSI analysis in an AWI situation, including feedback mechanisms;
- address both *in situ* or on-site issues and basin-level issues, recognizing the functional linkages of wetlands;
- involve all stakeholders in an open and inclusive process so that the skills and contributions of the different groups, organizations and individuals can be utilized and ownership of the responses shared;
- include institutional development, as this is critical to response development and implementation;
- be sensitive to the specific circumstances they are operating in, and respond to facilitating factors and bottlenecks.

Overall, responses must be sensitive to socio-economic, poverty reduction and ecological needs in wetlands in order to ensure the sustainable use of wetlands for multiple ecosystem services that benefit soci

