Guiding sustainable agriculture-wetland interactions (GAWI)– sustaining food security and environmental sustainability in wetland ecosystems

Agricultural expansion and intensification are the biggest drivers of wetland ecosystem transformations, frequently at the expense of biodiversity and regulating functions as water retention and purification. On the other hand wetland ecosystems are frequently crucial rich natural resources bases on which the poor depend for food security and livelihoods. With increasing rainfall variability and climate change, this dependency on wetland ecosystems is bound to increase. Given the current rapid degradation and loss of wetland ecosystems worldwide, there is an urgent need to guide the use of wetland ecosystems and wetland-based agricultural practices into a sustainable practice that: (i) ensure the sustainability of the ecosystem and the preservation of the natural resources base, including biodiversity; (ii) fosters the adoption of multiple good wetland agricultural practices that are geared towards optimizing food security and agricultural production while sustaining the ecosystem.

The knowledge question on providing guidance on agriculture-wetland interactions is of global relevance, fitting the global mandate of FAO and Ramsar.
It is, however, foreseen to empirically base and initiate local capacity building in sustainable guidance at a number of pilot projects in which international partners are engaged. Among these: Malawi, Mali, Ethiopia, Mozambique (tbc), India, Indonesia, Vietnam (tbc).

The guidance of sustainable agriculture-wetland interactions is a direct follow-up of the water for food and ecosystems policy that LNV initiated and engaged with, together with FAO, through the FAO/NL conference on the same topic. The proposal is explicitly aimed at fostering the multiple use of natural resources and cross-sectoral engagement across water, agriculture and nature. In addition it feeds a direct demand from the Ramsar convention, supported through LNV multilateral policy, as agreed upon in the COP 10 of Ramsar (see attachment 1). These policy issues of sustainable and multiple uses of water resources across water, agriculture and ecosystem sectors are also reiterated in the outcomes of the CSD-17, as expressed in common vision (attachment 2).

Project outputs:

The outputs to be provided are three-fold:

1) Delivery of a set of three interrelated guidelines, which will be adopted by Ramsar as technical papers at COP 11, to be co-published by FAO:

- Methodological guideline on the application of the Ecosystem Services – DPSIR framework for formulation of multiple response strategies in agriculture-wetland interactions;

- Methodological guideline on the application of the livelihoods framework for the assessment of socio-economic impacts of wetlands use and response strategies;
- A reference manual on Good Wetland Agricultural practices, for inclusion in the response strategies.

2) Capacity building of a sustainable agriculture-wetland " support and training unit" , consisting of number of agriculture-wetland experts/practitioners, who will provide active support to the pilot projects of the various consortium partners in applying and testing the guidance.

3) Participatory formulation, implementation and impact monitoring of multiple response strategy for sustainable agriculture-wetland interactions in 4 to 8 wetland pilot sites, with specific emphasis on food security, livelihoods/poverty reduction, sustainable ecosystem services, and cross-sectoral governance. Fostering of cross-sectoral collaboration and governance at both local and national governance levels through implementation of the response strategy.

Implementation strategy:

The project is to be implemented by the GAWI consortium established in 2006, consisting of FAO, Ramsar (Secretariat & STRP), WUR, Wetlands International, IWMI and Wetland Action. The consortium may be further expanded and strengthened with partners that have expressed keen interest on elaborating the outcomes and recommendations of the GAWI-consortium's first output presented at Ramsar COP10 and WWF5-Instanbul: *Scoping Agriculture-wetland interactions – Towards a sustainable multiple-response strategy* (a joint publication by FAO, Ramsar and WUR: http://www.fao.org/docrep/011/i0314e/i0314e00.htm).

The outputs defined follow directly upon the conclusions and recommendations of the first phase of GAWI, and as adopted by Ramsar COP10 in its strategic plan 2009-11, wherein agriculture-wetlands interactions has been accorded immediate priority. The aim is to deliver the project outputs through the collaborative mechanism of the GAWI consortium, whereby consortium members are encouraged to contribute to individual outputs as per available expertise and means (whether in kind or financial). The overall coordination and project (content) steering will be conducted through the GAWI consortium, and in specific through GAWI-Ramsar STRP consultations. The latter being crucial to secure the endorsement of the GAWI project and outcomes by the Ramsar Convention. The project will aim to appoint for each output a lead/coordinator from the GAWI consortium.

Guideline modules:

The guideline modules on *methodological application of the DPSIR, Good Wetland Agricultural Practices (GWAPS)* and *livelihoods perspectives* have been identified in the previous phase as the primary issues to address in agriculture-wetlands interactions. The way in which to address these issues have been explored and assessed during the previous GAWI phase (see Water Report 33), and are currently being worked out in a detailed conceptual approach and work plan. The main features of which are set out below:

DPSIR approach for multiple response strategies:

The DPSIR analytical framework forms the main methodological approach to deal with agriculture-wetland interactions in a comprehensive and congruent manner. By combining the DPSIR framework with the ecosystem services framework of the MA, a congruent analytical framework is provided that explicitly focuses on:

- the sustainability of the ecosystem, defined in terms of the attainment of a balance in ecosystem services, that characterizes the state (S) of the system;
- the socio-economic impacts (I) of the benefits that are derived from the ecosystem services and how these impact upon livelihoods;
- the environmental, economic and policy drivers (D) that influence the specific exploitation/use of ecosystem services;
- the technological production and resources management means that are being deployed by stakeholders in the (agro)wetland ecosystem to respond to drivers and exploit the ecosystem services for the attainment of specific livelihood benefits – which lead to specific pressures (P) on the exploitation and manipulation of the state of the ecosystem.

The DPSIR analysis provides a congruent analysis of the complex of interrelated causal chains across drivers, pressures, state and impacts, which enables the formulation and targeting of multiple responses strategies that are aimed to redress the state and impact of wetland ecosystems use through specific responses at driver-pressure (policy), pressure-state (technical) and state-impact (livelihood and governance) causalities. (See also WR33.) The DPSIR provides the common analytical framework to foster cross-sectoral and interdisciplinary collaboration and integration (e.g. across crop production (agronomy), fisheries/aquaculture, livestock (animal husbandry), (agro)forestry, nature conservation & BD, water management, policy, governance and socio-economic analysis).

The guidelines module on DPSIR approach will be a methodological guideline on the application of the DPSIR on agriculture-wetland interactions in ecosystems, with specific emphasis on the outcome of formulating a multiple responses strategy that is specifically targeted at different elements of the drivers, pressures, state and impacts complex; encompassing the different disciplines and strategies it will entail. This module will provide a detailed methodology and examples for a stepwise approach of compiling the DPSIR (element by element), and identify their causal interrelations through the

composition of the DPSIR “horendogram”. The module will be an elaboration of section II of WR33, with specific focus on defining the multiple responses strategy on the basis of the analysis. Whereby emphasis is given (with examples) to the implications that responses are multiple in their nature (e.g. technical, managerial, policy, economic, social, governance etc.), and can be applied by multiple agents/stakeholders either simultaneously or sequentially.

Good Wetlands Agriculture Practices (GWAP) module:

The GWAP module is specifically targeted to inform technical responses of agricultural practices that may favorably alter the pressures (P), and thereby the driver-pressure-state interactions. Drivers as fulfilling the attainment of food security are factors strongly shaping current agriculture-wetland interactions, and are there to stay (see WR33). The principal aim is thus to define GWAP that (a) acknowledge the existing drivers to exploit wetland ecosystems for their provisioning services, and (b) foster agronomic and water management practices that have a minimal disturbing/detrimental influence on the state of the ecosystem, and hence the other ecosystem services. GAWP, in analogy with the well established GAP (good agricultural practices), need then to be defined in terms of production and management techniques/practices that have a minimal impact in (a) agricultural based pollution and biodiversity impact (fertilizer/herbicide management, biodiversity, carbon sequestration etc), and (b) the hydrological and ecological state of the ecosystem. In addition, GWAP will need to foster diversification of agriculture, as a strategy of minimizing mono-stresses associated with mono-culture on the state of the ecosystem. Although primarily intended to address the pressure-state interactions of agricultural uses of wetland ecosystems, well established GWAP may also serve, as is currently increasingly the case with GAP, to address driver-pressure interactions when used as product certification tools in agricultural markets.

Although primarily targeting technical response measures, it is not deemed feasible to provide comprehensive technical guidelines on GWAP. The intrinsic pitfall, of which GAWI phase I suffered, is that the 42 classes of Ramsar wetland types with numerous types and typologies of agricultural uses/systems, as well as 22 types of *in-situ* and up- and downstream basin level agriculture-wetland interactions, will lead to an unyielding number of possible practices/interactions to cover. Besides, a considerable body of work and reference material already exists within the fields of GAP (agricultural practices), the EU-Water Framework Directive (aquatic ecological criteria) and Integrated Pest Management (IPM) (agriculture and biodiversity services) that may well be adopted within the proposed framework of GWAP. Therefore a framework is currently being worked out by WUR for how to address and best give shape to the GWAP module. As a point of departure, criteria will be developed which GWAP will need to fulfill from the point of view of sustainable agriculture, hydrology and ecology. This is to be followed by an assessment of to what extend existing reference material (GAP and EU-WFD) may fulfill the defined criteria from a wetland ecosystems perspective, and what may be the ensuing gaps that remain to be filled. The GWAP module may thus take the form of providing a framework/methodology to define a set of criteria and objectives for GWAP to include in the response strategy, accompanied by a reference guide to existing

sources/material that may provide technical guidelines on existing good practices that may fulfill the set criteria.

Livelihoods module:

The livelihoods approach has been frequently linked and applied to the principle of "wise use of wetlands" adopted by the Ramsar convention, in particular with regard to the frequent dependency of the rural poor on wetlands in sustaining their livelihoods (re. wetlands & poverty reduction programs). Within the DPSIR framework, the livelihoods approach may provide a practical tool to analyze the socio-economic impact (I) of the use and management of (agro)wetland ecosystems, in terms of who is benefitting from the current driver-pressure-state configuration in livelihood means, and whose livelihoods are under threat due to changes in the state of the ecosystem, and hence the services/benefits it can provide. As reported in WR33, there is for instance a stark tendency for tradeoffs to occur with intensified crop production at the expense of fish population, and hence between crop-based livelihoods and fisheries dependent livelihoods.

In order to seemingly fit the livelihoods approach into the overarching DPSIR framework, the guidelines module for the livelihoods approach will need to be framed in terms of informing and complementing the DPSIR analysis. In particular on three fronts:

1. the socio-economic Impact (I) can be described from a livelihoods perspective, with specific focus on how identified livelihoods (or livelihood strategies) are given shape through specific pressure-state (i.e. specific ecosystem service) – impact configurations; and whether there are other pressure-state configurations (re. GWAP) feasible that can provide similar livelihood means;
2. in terms of intra-livelihoods socio-economic impacts, provide a methodological tool to analyze and map the intra-livelihood impacts of DPSIR configurations and the state of ecosystem services – e.g. the pressure-state configuration of crop-dependent livelihoods may adversely influence the state of the ecosystem in terms of fish population (or forestry), and hence lead to positive livelihoods impacts for crop dependent livelihoods, but negative ones for fish/forestry dependent livelihoods;
3. diversification of the use of multiple ecosystem services forms the backbone of the sustainability concept – both diversification within provisioning services (e.g. agriculture) as across ecosystem services (e.g. provisioning, regulating, cultural). This has implications for the livelihoods approach to be adopted within the response strategies in that a diversification of livelihoods means/strategies is targeted – whether within livelihoods or across livelihoods. GWAP may provide tools to achieve diversification within agriculture, but the diversification across regulating and cultural services, and how these may provide for tangible livelihood means, is still a socio-economic hurdle to take that merits specific focus and attention.

Piloting multiple response strategies with the guidance modules:

Outputs two & three are defined in terms of piloting the methodological guidance of the three modules in a number of agriculture-wetland pilot project/programs GAWI consortium members are involved with, by means of training and backstopping a GAWI support & training unit. The unit will consist of selected experts/practitioners from either GAWI consortium members and/or pilot programs. The support unit will be established and trained by GAWI through a 3 day workshop, to be held in the first quarter of 2010. The aim of the workshop is to train and discuss with the participants the application of the GAWI guidance modules in the pilot projects/programs. Each member of the support unit will support one pilot case in conducting the comprehensive DPSIR analysis, including the GWAP and livelihood modules, to map out current dpsi-configurations, characterize the sate of the ecosystems services and, formulate in consultation with project staff and stakeholders a comprehensive multiple responses strategy that targets specific elements of dpsi. The GAWI teams involved in the development of the guidance modules will be responsible for preparing and delivering the workshop training on their subject, including the provision of training and support material. The workshop will comprise of five parts: (i) overview of agriculture-wetland interactions and ecosystem services (WR33); (ii) DPSIR framework and analysis – building the dpsi-horendogram; (iii) GWAP for redressing pressure-state and driver-pressure interaction in provisioning services; (iv) livelihoods approach for socio-economic impact assessment and livelihoods informed response strategies; (v) formulating a comprehensive multiple response strategy.

In the second and third quarter of 2010 each member of the GAWI support unit will engage with one pilot project/program to elaborate the DPSIR analysis and formulate a multiple response strategy. (For non-project members at least one field visit will be conducted during this process to discuss and elaborate the DPSIR and response strategy with stakeholders.) During this period the GAWI team members working on the guidance modules remain available and engaged for consultation and backstopping, through electronic means. The support unit members will report back immediately any identified shortcomings, queries or gaps to respective GAWI team members, and summarize their DPSIR analysis, multiple responses strategy and methodological reflections and feedback into a GAWI pilot-case summary report by the end of the third quarter of 2010.

At the end of third quarter / beginning of the fourth quarter of 2010 a feedback workshop will be held with the support unit and GAWI team members. This to discuss the results of the pilot applications of the GAWI guidance, feedback the main conclusions and recommendation into the guidance modules, and reflect, through comparison of the pilots, on the strengths and weaknesses of the responses strategies and the remaining guidance required to strengthen these.

The pilot projects/programs to be included in the GAWI pilot case will stem from the existing agriculture-wetland project portfolio of GAWI consortium members. Wetlands International (WI), for instance, is keen to include their agriculture-wetlands project of Mali (Inner Niger Delta), India, Indonesia, Argentina (tbc) and Malawi (with WA – tbc).

Likewise, IWMI/CPWF may be in a position to contribute cases from East and Southern Africa, as well as South Asia (tbc), as are Wetland Action and FAO (both tbc). It is foreseen that GAWI support unit will be primarily composed of members stemming from the GAWI consortium partners that are involved with/in the respective pilot projects (either as project officer or thematic program officer), who will be contributed 'in kind' by the GAWI partner. Likewise, the GAWI team members working on the guidance modules and organization of the workshops, will be provided 'in kind' by the GAWI partners. For the operational costs of the workshops, each GAWI consortium partner is expected to contribute a financial share.

Threats that may influence the implementation.

The wetland site pilot activities are largely dependent on ongoing and partially in the pipe-line program activities of GAWI consortium partners. With regard to ongoing programs, most are committed till the end of 2010, but have no guaranteed funding yet for 2011. Pipe-line programs are set to be committed by the beginning of 2010, but may be subdued to delays or cancelations as stemming from the funding agencies. The listed four pilots are the low estimate (secured 2010), and the 8 the high estimate including pipe-line.

Budget

WUR:

100 person-days of expertise for 2010 (€100,000 equivalent), of which €10,000 are set apart for financing of workshops. WUR will provide four experts (1 overall GAWI coordination and DPSIR module, 1 Livelihoods module, 2 GWAP module)

Ramsar STRP (CHF 30,000) to be further specified

FAO (tbc) to be further specified and confirmed. Preferably with expert contributions to DPSIR and GWAP modules, and financial support of workshops and pilots.

Wetlands International (€80,000), to be specified (at least 1 expert on Livelihoods, and 3 tot 4 pilot and corresponding Support Unit members)

Wetland Action (tbc and specified)

IWMI/CPWF (tbc and specified)

WWF (to be approached)