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Agriculture and wetland interactions: recent progress and STRP-related activities 2009-2012

Introduction

1. This paper provides a brief summary of some activities relevant to Ramsar progress on issues of interactions between wetlands and agriculture which have involved the Scientific and Technical Review Panel (STRP) or address STRP-related issues during the 2009-2012 period. It covers two main areas of activity:

   i) four workshops/symposia held in follow-up to Resolution X.31 (2010) on *Enhancing biodiversity in rice paddies as wetland systems*; and
   ii) recent work implementing the Guidelines for Agriculture and Wetlands Interactions (GAWI) initiative.

Workshops implementing aspects of Resolution X.31

2. An 'International Workshop on Rice Paddy and Wetland Conservation: Best Practices in Asia' was held in Takashima, Japan on 6-7 August 2010. The workshop proceedings report *Successful Cases on Sustainable Rice Paddy Farming Practices and Wetland Conservation in Asia* was was compiled by Wetlands International Japan, edited by the STRP, and published in January 2011 by the Ministry of the Environment of Japan.

3. The report contains 15 papers on different aspects of rice and biodiversity management from around Asia, and is available at: http://www.wetlands.org/_strp/WGAgandwet/Library/Report%20Takashima%20meeting-Successful%20Cases%20on%20Sustainable%20Rice%20Paddy%20Farming%20Practices%20and%20Wetland%20Conservation%20in%20Asia_final.pdf .

4. Although there are no summary or overall conclusions provided in the report, the Foreword gives a flavour of the scope and range of issues covered:

> This volume contains the proceedings from the International Workshop on Rice Paddy and Wetland Conservation: Best Practices in Asia held in Takashima, Japan on August 6-7, 2010. Organized by the Ministry of the Environment, Japan together with the Ramsar Regional Centre East Asia,

Wetlands International Japan, the Ramsar Centre Japan, and Takashima City, it provided a regional platform for wetland scientists, managers and the broader wetland community to come together and discuss the sustainability of rice paddy farming practices and wetland conservation.

In many ways, the rice paddy itself can be considered a form of wetland. The Ramsar Convention recognizes the potential role of such "man-made" [*vere* "human-made"] wetlands in regional wetland conservation, especially in supporting migratory bird species. The supplemental benefit of well-managed rice paddy can be seen in the large numbers of birds utilizing these habitats along flyways. Given the widespread decrease of bird populations in Asia and ongoing impacts to wetlands, the role of rice paddy may increasingly be critical to species survival. Whilst the many drivers of habitat loss and degradation (including agriculture) need to be addressed regionally, the potential for habitat restoration and approaches which better integrate wetland conservation with agricultural production also need to be considered.

The concept of "multi-functionality" lies behind many of the presentations from this Workshop. Often referred to as "eco-agriculture" or "agri-ecology", the recognition and protection of ecological components and processes within the agriculture landscape is a core principle in what many regard as a more sustainable way of production. For wetlands, this approach requires the conservation of not only natural wetland systems across the farming landscape but also the adoption of land uses and practices which assist in the maintenance of these wetlands. In rice production systems this affects the selection of rice varieties, how rice is grown and harvested, the sources of farm water and the hydro-biological connectivity of the farm to surrounding wetlands.

It may result in less or no pesticide use, winter flooding of rice fields, crop types which encourage native species, and farming infrastructure which favours the movement of animals and plants between farms and adjacent wetlands. Many other novel advances in multi-functionality are occurring within agricultural systems which do not affect yields, and these too should be encouraged.

Importantly, the benefits from well-managed rice paddy extend outside of biodiversity conservation to groundwater recharge, climate moderation, flood and erosion control, landslide prevention, provision of plant and/or animal food resources and medicinal plants. This has been explicitly recognized by the Ramsar Convention through the adoption of Resolution X.31 "Enhancing biodiversity in rice paddies as wetland systems". Significantly, it is many of these "ecosystem services" which may be the most influential in achieving better recognition of the values of traditional rice paddy cultivation, and in doing so, help to drive regional wetland conservation. A better understanding of such services is needed in Asia, especially their valuation as part of decision support tools in landscape management. In particular, the cultural values associated with integrated rice paddy-wetland systems require further research.

Papers on this theme are presented by authors drawn from across Asia representing various different organizations in the public, private and community sectors. From the role of rice paddy in climate change mitigation to integrated methods of agricultural intensification, and from the policy drivers for achieving change to the best practices on-ground – these proceedings provide a contemporary assessment of the challenges and opportunities facing the region in balancing food production with nature conservation.

5. Two further workshops were proposed during this one in Takashima: one on specific issues of rice and pesticide usage, and the other on rice and wetland conservation.

6. The "Pesticides, rice and wetlands" workshop was held in Singapore from 3-4 March 2011, hosted by James Cook University Singapore and supported by the RoK Ministry of Environment, the Ministry of Environment-Japan, and the Ramsar Regional Centre East Asia. A workshop report was issued in May 2012, and is available at http://www.ramsar.org/pdf/Singapore_Workshop-report.pdf. Its summary and conclusions are provided here:

1. The State of Scientific Knowledge

The excessive use of pesticide is likely to result in greater probability of pest outbreaks because of impacts to ecosystems (e.g. Brown planthopper in rice) and off-site migration of pesticides exceeding environmental guidelines is occurring and likely to be adversely impacting on downstream ecosystems.

Better understanding of current pesticide use and screening level risk assessment is needed as too the development of integrative assessment programs. Persistence, fate and effects of pesticides in tropical rice wetlands should be a priority, together with analysis of impacts on benthic organisms impacts and the role of sorbed pesticides. Mixture toxicity (chronic and acute) requires further research.

The ecosystem services of rice wetlands require improved understanding and quantification, and such services need to be valued.

A Resolution adopted by the Ramsar Convention on pesticide use, control, management can and should be used to improve this situation.

2. Policy Approaches

Improved policy is required for the more efficient/effective use (for wetland biodiversity
conservation) of pesticides. Note this may imply reduced use, no use or alternative non-pesticide pest control methods.

Improved policy on subsidization of pesticide use (especially poor practice), and conversely subsidization of good practice e.g. through 'insurance' schemes for trialling new/better practices, is needed. Pesticide use and productivity (eg

do subsidies actually work for production?) needs to be examined as too the externality costs on biodiversity and wetland conservation.

Contracting parties of the Ramsar Convention should develop and apply risk assessment procedure before pesticide use, together with strict enforcement of labelling/packaging requirements to minimize adverse effects on biodiversity.

Contracting parties should develop regulation on certification and training for retailers to provide better pesticide application advice, and parties should develop a reporting mechanism for pesticide usage.

Better coordination among pesticide, environment and wetland related government agencies is needed and should be harmonised across countries (e.g. through the Global Harmonizing System for chemical trade.

Improved monitoring of the impact of pesticide use on wetland biodiversity and evaluation of effectiveness of regulation is needed and this could be through the establishment of a dedicated research centre on the impact of pesticide use on wetland biodiversity.

3. Communication, Education and Public Awareness

Existing programs such as that by the FAO on rice IPM in Asia, which has subsequently created national IPM programmes, is acknowledged and supported. Similarly, efforts from NGOs (e.g. PAN AP) to discourage the use of highly toxic chemicals is acknowledged.

Government IPM programmes as occurs in Vietnam and the Philippines (KASAKALIKASAN) should be supported.

It is recommended farmers should move from IPM to eco-agriculture approaches using education and through incentive-based farmer participation, which reward 1) gaining knowledge, 2) improving profitability and 3) advancing cultural awareness. This should be tracked through attendance and active participation in local educational activities and formal assessment of uptake of education in whole of farm activities.

Market based approaches through branding of eco-agriculture products (not just IPM or organic) and supported through certification of "biodiversity friendly" rice is recommended. There is a need to develop standards of biodiversity friendly rice and need to develop farmer registration processes.

This should be tracked through identifying the availability and market share of biodiversity friendly rice and monitoring this over time, the number of registered farmers and the number of certification schemes in place.

The general public (including policy makers) should be better engaged through promotion of the health benefits (e.g. nutrition) of biodiversity friendly rice, food safety in terms of absence in use of pesticides, food security (local

provenance) and national heritage and cultural (eco-tourism). The value of eco-tourism associated with biodiversity friendly rice should be tracked.

Better ways to translate scientific information for use by farmers, markets and the general public (through multimedia, fact sheets for policy makers) is needed, as well as the synthesis of existing scientific information to create new integrated perspectives of rice wetland management.

Visualizations of biodiversity friendly rice production systems could be a tool used to assist."

7. Following up on the Singapore workshop, a further one on rice paddy and pesticide issues, the "Sangju Rice Paddy Symposium", was held in August 2011, hosted by Sangju City (RoK), Gyeongsangbuk Province, and the RRC-East Asia and supported by the Limnology Laboratory in Pusan National University. The purpose of the symposium was to develop the text of a COP11 Draft Resolution (COP11 DR15) concerning the sustainable use of pesticides in rice paddies. Presentations and discussions focused on the increasing upward trend in the use of agricultural chemicals in rice paddies and the impact that this has had on rice production, pest outbreaks, and the health of the rice farmers. Participants also shared information on the conservation and management of the rice paddies and lotus fields at GongKumJi – a potential Ramsar Site.

8. A further workshop, on "Wetlands and agriculture (including rice paddy issues)", was held as part of the Asian wetland Symposium in Wuxi, China, on 13 October 2011. A report of the workshop is not yet available. Amongst the actions called for in the "Wuxi Declaration" adopted by symposium participants is: "6. Maintain the ecological character of rice paddy ecosystems and other wetland agricultural ecosystems, e.g., by avoiding the overuse of pesticides, to secure food security, enhance biodiversity and protect human health."

Implementation of the GAWI approach *(Information provided by Adrian Wood and Geraldo van Halsema)*

9. The Guidelines for Agriculture and Wetlands Interactions (GAWI) initiative, developed during the 2006-2008 triennium, was based on the understanding from the Millennium Ecosystem Assessment that sustainability in wetlands requires the achievement of a balance in ecosystem services.

10. The work of the GAWI initiative was reported to Ramsar Contracting Parties at COP10 in COP10 DOC. 26, and its report was published as a joint FAO, Ramsar, and Wageningen University & Research (WUR) report in the FAO Water Reports series (http://www.fao.org/nr/water/docs/WaterReports33.pdf).

11. Agricultural use of land in and around wetlands (AWIs) tends to put sustainability under pressure because of the imbalance in ecosystem services which develops and the stresses on those services, including biodiversity, which are created. These imbalances and stresses also threaten to undermine agriculture itself and can create conflicts because of the way in which agriculture's monocultural orientation appropriates resources and ecosystem services at the expense of other livelihoods and wetland users.

12. The GAWI work showed how analysis of AWI situations can be undertaken using the DPSIR (demands, pressures, state changes, impacts and responses) framework to understand the processes threatening wetland sustainability and then identify interventions which can reduce the ecosystem-service imbalances and help achieve sustainable use. The GAWI guidance has emphasised the need for diversification towards a better mix of uses of ecosystem services in wetlands to ensure sustainability, with more attention given to regulating and support services (such as flood moderation and nutrient cycling), and with provisioning services (such as food, water and material provision in different ways) diversified to reduce the emphasis on agriculture, especially mono-cropping. This guidance can be used to develop functional and strategic planning of land and water use in individual wetlands and at a basin scale, to ensure that both wetlands and catchments have a better balance of ecosystem services, benefits and livelihoods for their beneficiaries, and thus improve prospects for sustainability.

13. During the period 2009-2010, the GAWI method was tested in two countries, India and Malawi, to assess its value in analysing AWI situations and stimulate the development of policies to maintain food security and ensure sustainability in wetland ecosystems. Led by Wageningen University & Research and funded by the former Netherlands Ministry of Agriculture, Nature & Food Quality, this project analysed one agriculture-wetland situation in each country with support from Wetlands International (India) and Wetland Action (Malawi). The findings were used in consultative multi-agency policy workshops, hosted by FAO, to produce a multiple response strategy, with recommendations on policy, natural resource management methods, and governance arrangements.

14. In Malawi, the analysis was of seasonal and semi-permanent wetlands, whose sustainability is under increasing pressure from expanding food production, as these areas are seen as an essential part of an adaptive strategy in response to climate change for both food and water security. In India, Lake Kolleru, a Ramsar wetland site on the Montreux Record of heavily degraded wetlands, was studied with a view to developing a plan to revitalise the ecological state and biodiversity of the wetland so it can be removed from the list of endangered wetlands.

15. In Malawi, the workshop participants found the GAWI approach applicable to a range of agro-wetland situations where it could help define sustainability, especially in terms of the balance of multiple ecosystem-service uses. In the workshop the different government sector agencies were able to identify actions which would contribute to the overall sustainability of the seasonal wetlands through sector-specific innovations for improved wetland and catchment management practices, thereby providing sector-specific sustainability agendas. Stakeholders explored together the wider or catchment setting of the wetlands with a view to developing a strategic approach to improving the functioning of these areas, with the main focus on improved hydrological regulation. This work has also contributed to the current policy reforms in Malawi, by integrating the GAWI framework into the Decentralised Environmental Guidelines and the Wetland Regulations under the Environmental Management Act.

16. In India, the tensions between large-scale irrigated agriculture and aquaculture were analysed and the GAWI-framed study informed a meeting of the Kolleru Management Committee. Revitalising water regulating services in terms of quantity and quality was seen

as the primary step in order to ensure the sustainable state of the wetland which will improve biodiversity, while enhanced water productivity can also improve the productivity and economic benefits of the sectors. Sustainable innovations to increase the value of wetlands with cross-sector collaboration were seen as a more sustainable way to maintain wetlands than the imposition of conservation regulations and restrictions which will further fuel a politicised and entrenched situation.

17. The results of this work have shown that the GAWI framework can be applied in a range of different ecological and socio-economic settings (including small seasonal wetlands in Malawi and Lake Kolleru in India) and can produce relevant, practical and well-targeted multiple response strategies for wetland management which will enhance the sustainability of agriculture and wetland ecosystems. Critically, the GAWI approach has proved effective at bringing together different stakeholders and sectors – water, agriculture and nature – and achieving their effective cooperation towards a mutually agreed objective: sustainable agriculture-wetland interactions.