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Draft policy brief on wetlands and agriculture: Transforming agriculture to sustain people and wetlands

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Transforming agriculture to sustain people and wetlands

Summary

Wetlands are one of the world's most highly valued ecosystems. Covering >1.5 billion hectares they sustain people, biodiversity, cultural traditions, and help to regulate the environment. Conserving and enhancing the natural capital of wetlands is critical to achieve the Sustainable Development Goals, and to meet the strategic objectives of the Ramsar Convention[1].

Wetlands support agriculture[2], as a source of water for crops and livestock, as habitat for aquaculture and rice production, and by providing fertile land which supports high agricultural productivity. However, the rapid development and intensification of agriculture has come at a cost for many wetlands.

Transformative action is needed, to reverse the trend of wetland loss and degradation while simultaneously providing food security and responding to anticipated impacts of climate change on wetlands and agriculture. This Policy Brief calls on policy-makers across agriculture, water and wetland sectors to adapt farming systems and practices and take action to ensure the wise use and sustainable management of wetlands.

An Oriental White Stork flying over a human-made wetland (rice paddy), Japan. Source: Case study

[1] Ramsar Strategic Plan 2016-2024

[2] "Agriculture" is the deliberate effort to cultivate crops and/or raise livestock for sustenance or economic gain, and include fisheries, marine products, forestry and primary forestry products. For the purposes of this Policy Brief the focus is on livestock, cropping and aquaculture agricultural systems.

Policy recommendations

Policy-makers need to:

- Work directly with the agricultural sector and local communities to transition away from non-sustainable practices, through changes to policy, institutional and financial frameworks.

- Avoid and reduce agricultural pressures on wetlands, including Ramsar Sites, by addressing the direct drivers of wetland degradation, in particular: land conversion; water extraction and diversion; non-sustainable use of fertilisers and pesticides; over-harvesting of biota; and introduction of invasive species.

- Establish policies and mechanisms to stop the conversion and loss of wetlands for agricultural development, to meet the Sustainable Development Goals and to achieve the objectives of the Ramsar Convention.

- Establish regional, national and local action plans that apply the five principles, outlined in this Policy Brief, for transformative action for sustainable agriculture and wetland wise use.

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The issue

Wetlands perform critical ecosystem functions in the landscape and provide a wide range of ecosystem services. Wetlands support agriculture, as a source of water for crops and livestock, as habitat for aquaculture and rice production, and on fertile floodplains they support high agricultural productivity. Agricultural development, however, continues to be a primary driver of wetland loss and degradation. Across Europe, the Americas, Oceania, Asia and Africa, wetlands have been converted to agricultural land to support people's livelihoods and economic development[3], and this conversion is ongoing[4].

Transforming agriculture and restoring inland, coastal and human-made wetlands is needed to protect wetlands, and to enhance the resilience of nature and people to climate change, food shortages and water stress.

1.7 billion people live in river basins under water stress (UNCCD 2017)	**2.9 billion people** have an unsafe or risky water supply (UNCCD 2017)	**20% of earth's land surface** is degraded (UNCCD 2017)	**35% of the world's wetlands** have been lost since 1970 (Darrah et al. 2019)	**Increased agricultural production** is needed to feed people (FAO/IWMI 2018)
70% of all water extraction is for	**9x more N-fertiliser** is applied	**20-25% of global GHG** emissions are	**>50% of Ramsar sites** are at risk of	**Conservation and sustainable development**

[3] Ramsar Convention, 2018
[4] UNCCD, 2017

agriculture (FAO 2011)	compared to the 1960s (FAOSTAT)	caused by agriculture and forestry (IPCC 2014, 2019)	degradation due to agricultural practices (RSIS database)	**goals cannot be achieved** on current trajectories (IPBES 2019)

Buffalo ploughing a human-made wetland. Source: Ramsar photograph library

Wetlands help sustain agriculture and people

The benefits of wetlands for agriculture and people extend beyond production values (i.e. contribution to food security and livelihoods), which are well established[5]. In well managed catchments, they contribute significantly to regulating climate, water, nutrients, biota and soils: essential functions for sustaining people in inland and coastal regions of the world[5]. For instance, on about 5-8% of the land surface, wetlands store about 30% of global soil carbon stocks[6]. Wetland-agriculture linkages also sustain human wellbeing, providing a sense of place and cultural identity.

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Agriculture is one of the major drivers of wetland loss and degradation

Wetland loss due to land conversion continues to be a global concern. Since 1970 around 35% of the world's wetlands have been converted to other land uses, with agriculture frequently identified as one of the major drivers of change. Over the same time, the development of human-made wetlands used for farming has occurred with large increases, for example, in the extent of rice paddys[7].

[5] E.g. FAO, 2019
[6] Ramsar Convention, 2018
[7] Darrah et al. 2019

Non-sustainable agricultural development continues to degrade wetlands, at local and catchment-scales. The application of fertiliser (nutrients) and pesticides is growing, particularly in Asia and Latin America, and agriculture drives high water stress in large areas of Asia, northern Africa, Australia, and the Americas, affecting people and wetlands[8].

The degradation of wetlands is context specific, but many wetlands globally are under pressure. For example, >50% of Ramsar sites are negatively-affected by agriculture-based practices (threats) with drainage (affecting 23% of sites), livestock farming (25%) and pollutants/effluents (22%) identified as some of the major drivers (Figure 1). Action is needed from policy-makers and wetland managers to evaluate the long-term consequences of non-sustainable practices on wetland values.

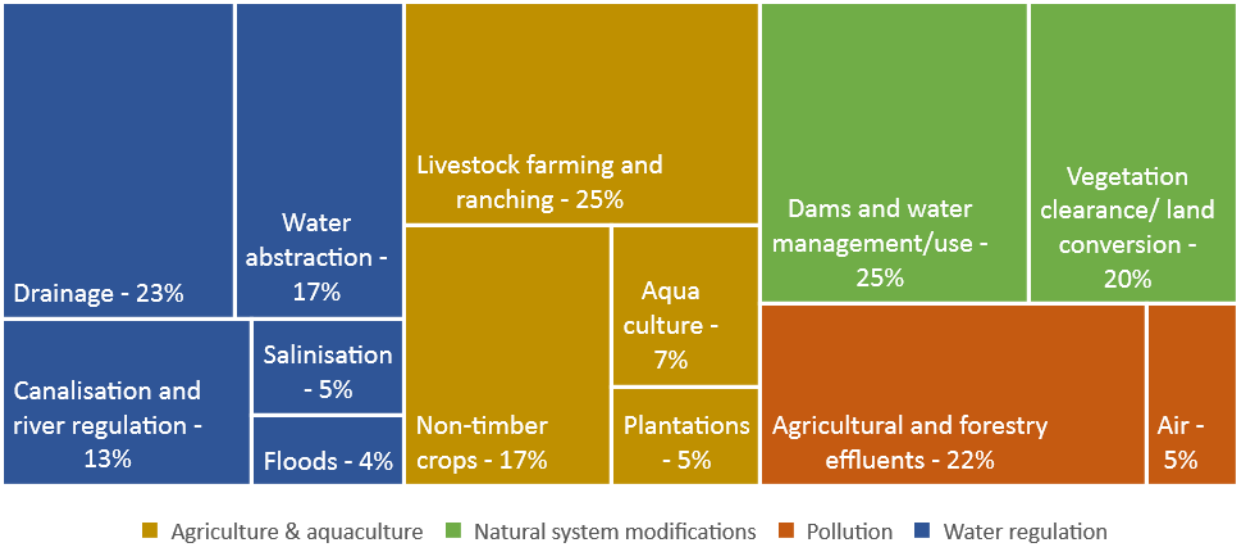

Figure 1. Agricultural threats to Ramsar Sites. Percentage (%) of Ramsar sites negatively affected by agricultural practices (threats) Refer to Ramsar Briefing Note X for further information.

[Case study] **Addressing agricultural pressures on wetlands - Bita River Basin, Colombia**

The Rio Bita Ramsar site is an 824,500-hectare wetland complex found within the Orinoco river basin in Colombia. Vast areas of wetlands within the basin are under threat due to the intensification of agriculture. In an effort to reduce pressures on wetlands, working with the Omacha Foundation, the Bita forestry sector has established an integrated environmental management plan, that clearly zones areas of the basin for conservation, restoration and sustainable production. The conservation agreement was endorsed by the Ministry of the Environment and has promoted the protection of wetlands alongside sustainable agriculture, that is further enhanced by actions to reduce hunting pressure, prevent fires and planting of native forest species, helping to preserve the ecological character of the Ramsar site.

[8] FAO, 2020; FAOSTAT; AQUASTAT

Savannahs, flooded forests and the gallery forest of the Bita River Basin, Colombia. Source: Case study

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Moving to sustainable agricultural practices

Urgent action is needed to improve regulatory and economic policies, farm practices, water infrastructure and to reduce pollutant use. Transformative change will require policy-makers to establish financial incentives, strengthen environmental policy and laws to control non-sustainable development, build capacity, and enhance cross-sectoral cooperation, taking pre-emptive and precautionary action to increase sustainability at the catchment scale.

Kafue Flats, Tanzania, a Ramsar site that supports biodiversity and people's livelihoods. Source: Ramsar photograph library

To guide policy development, better understanding of the impacts of agricultural practices on inland, coastal/marine and human-made wetlands is needed, as different agricultural systems create different environmental problems (Table 1). Intensive forms of agriculture are often dependent on high water use, high inputs of nutrients and pesticides, which can degrade the ecological character of wetlands[9]. Whereas the development of extensive forms of agriculture can result in wide-scale land conversion and loss of wetlands, or the introduction of new crops causing changes in wetland biodiversity. However, these different forms of agriculture can become sustainable by avoiding or mitigating negative impacts on the drivers of wetlands (Table 1).

Adapting agriculture to integrated production systems (crop-livestock-forestry-fish) can result in more efficient use of water and nutrients, reduce environmental impacts on wetlands, and enhance the social and economic resilience of local farmers and indigenous peoples reliant on agriculture within or near wetlands. Integrated systems can also support sustainable intensification, that is, increasing production on existing farmland, while avoiding the need for further conversion and degradation of natural wetlands.

Table 1. How different agricultural systems influence the drivers of wetlands. Refer to Ramsar Briefing Note X for definitions of intensive and extensive agricultural systems.

	Agricultural system

[9] E.g. Verhoeven & Setter, 2010

Anthropogenic drivers of change in wetlands		a) Rainfed extensive	b) Rainfed intensive	c) Irrigated intensive	d) Horti-culture		e) Livestock extensive	f) Livestock intensive		g) Aqua-culture extensive		h) Aqua-culture intensive	
					open	glass		pasture	landless	ponds	coastal shell-fish/seaweed	ponds	cages
Physical regime	Water quantity/ frequency		■	■	■	■		■		■		■	
	Sediment	■	■	■	■		■	■		■	■	■	■
	Salinity			■	■								
Extraction	Water			■	■	■	■	■	■	■		■	
	Soil & peat	■			■	■				■		■	
	Biota	■	■				■			■	■	■	■
Intro-duction	Nutrients		■	■	■	■		■	■	■		■	
	Chemicals		■	■	■	■		■	■			■	
	Invasive species		■	■	■	■				■		■	■
	Solid waste				■						■		■
Structural change	Drainage		■	■	■	■		■					
	Conversion		■	■	■	■		■		■		■	
	Burning	■					■						

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Building resilience of wetlands to climate change and increasing food demand

Integrated assessments[10] have repeatedly demonstrated the explicit connection between improved food security, poverty reduction, environment sustainability and responding to anticipated impacts of climate change, including for wetlands. Maintaining the sustainable production of food and fibre from wetlands, reducing the emissions from degraded wetlands, and protecting biodiversity is all dependent on conserving the soil-water properties of wetlands[11].

Addressing global needs by ensuring an adequate food supply and mitigating and adapting to the impacts of climate change will require engineering and nature-based responses to restore wetland functioning, underpinned by effective governance and participation by local communities[3]. Instead of converting wetlands to address one outcome (food supply), efforts to re-wet wetlands and capture carbon can be coupled with sustainable farming practices, such as paludiculture (farming on peat soils), and agroecology on wet pasture.

[Case study] **Improved collaboration and dialogue between agriculture and wetland sectors - Baie de Somme, France**

The Picardy Maritime Plain is a wetland (6,000 ha) in France highly valued for its diverse natural and cultural heritage. Historically shaped by livestock agriculture, its ecological character has been threatened due to farmers moving away from livestock farming to undertake more intensive (and

[10] E.g. Millennium Ecosystem Assessment 2005; Molden 2007; Boelee et al. 2011; IPBES 2018

[11] Moomaw et al. 2018

more profitable) crop cultivation. Over a period of 9 years, the Baie de Somme Grand Littoral Picard Joint Association, Somme Chamber of Agriculture, and Artois-Picardie Water Agency, have been supporting livestock farmers to return to the plains, helping to preserve biodiversity and undertake sustainable agriculture within the wetland.

Wet meadows of the Picardy maritime plain, France, support important habitat for wetland biodiversity. Source: Case study

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Policy responses – Transforming agriculture to sustain people and wetlands

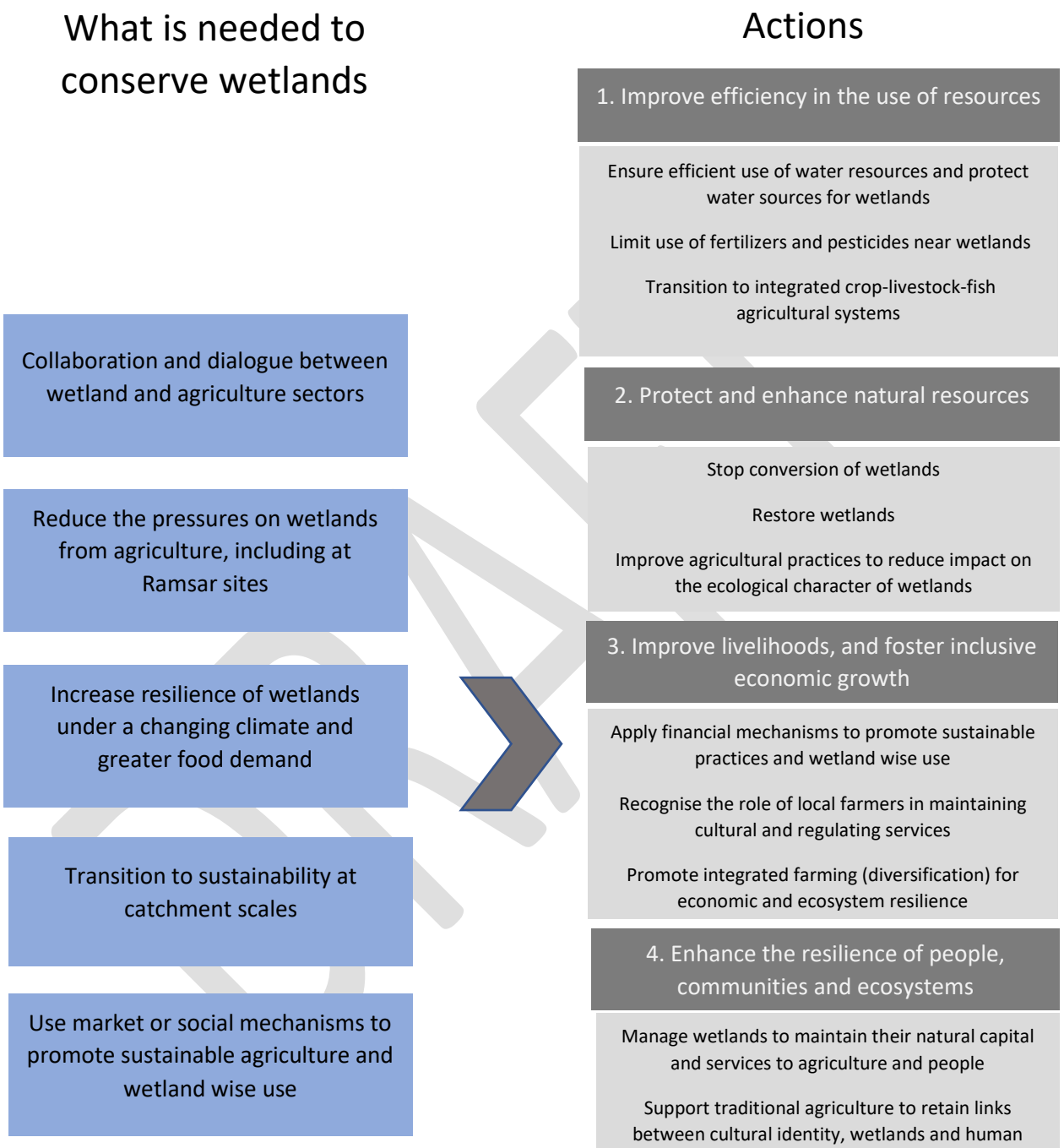
Humanity's challenge of providing food for people while enabling ecosystems to thrive remains. On current trajectories it will not be possible for environmental and sustainable development goals to be achieved[12]. The implications for wetlands are considerable. More than ever, the agriculture and environmental sectors must respond to the increase in global food demand, while ensuring the wise use of water and wetlands[13].

The strategic goals of the Ramsar Convention[14] call on Contracting Parties to address the drivers of wetland loss and degradation, and to effectively conserve Ramsar Sites and wisely use all wetlands. Action is needed across multiple agencies that govern and support land use, water use, agricultural development, and wetland management. Most critically, enhanced dialogue between agriculture and wetland/environmental sectors is needed to strengthen policies and undertake coordinated action.

Building on the five principles for transforming food and agriculture to achieve the SDGs (FAO 2014, 2018), we identify for policy-makers, the **priority actions to transform agriculture to sustain people and conserve wetlands** (Figure 3).

[12] IPBES, 2019
[13] E.g. FAO/IWMI, 2018
[14] Ramsar Convention Strategic Plan 2016-2024

Figure 3. Actions to transform agriculture to sustain people and conserve wetlands (adapted from FAO, 2014; 2018)



Waituna Lagoon, New Zealand, a coastal lagoon regularly opened to the sea to prevent inundation of low-lying livestock pasture. Source: Case study

Limitations and further research

This Policy Brief draws on various global assessments of water, food and wetlands, and synthesizes the key issues facing wetlands in the context of agriculture. The recommendations for policy-makers are based on global trends in water use, pollutants, wetland loss, and food demand. However, it is recognised that agricultural-wetland interactions are context-specific. Further information and research may be required at regional, national and river-basin scale on the status and trend of wetland-agriculture interactions, including projected changes in water and land use, and wetlands, due to changes in climate and socio-economic drivers.

Authors

Hugh Robertson, Department of Conservation, New Zealand; Anne van Dam, IHE Delft, The Netherlands; Marlos de Souza, FAO, Italy; Priyanie Amerasinghe, IWMI, Sri Lanka; Max Finlayson, Charles Sturt University, Australia; Ritesh Kumar, Wetlands International, India; David Stroud, United Kingdom

Citation

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Further reading

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