Convention on Wetlands

Ramsar

Transforming agriculture to sustain people and wetlands

Wetlands are one of the world's most important ecosystems. Covering over 1.5 billion hectares they sustain people, biodiversity, cultural traditions and help to regulate the environment. Conserving and enhancing the natural capital of wetlands, in line with the strategic objectives of the Convention on Wetlands[1], is critical to achieve the Sustainable Development Goals (SDGs).

Wetlands continue to be lost and degraded due to unsustainable agricultural development. Estimates based on available data show that approximately 35% of the world's wetlands have been converted to other land uses since 1970, with agriculture being one of the main drivers of change. More than half of the Wetlands of International Importance (Ramsar Sites) are negatively affected by agricultural practices.

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. 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. In well managed agricultural systems, wetlands are considered assets that support food production, good water management and ecosystem resilience.

This Policy Brief identifies priority actions across sectors to increase the sustainability of agriculture and promote the wise use of wetlands. These actions deliver on the Sustainable Development Goals (e.g., SDG 6, SDG 12 and SDG 15) as well as the goals and objectives of the Strategic Plan of the Convention on Wetlands (e.g., Goal 1 Addressing the Drivers of Wetland Loss and Degradation) while supporting critical efforts to respond to global climate change.

An Oriental White Stork flying over a human-made wetland (rice paddy), Japan. ©Toyooka City

1 Ramsar Strategic Plan 2016-2024, available at: https://www.ramsar.org/document/the-fourth-ramsar-strategic-plan-2016-2024.

2 "Agriculture" is the deliberate effort to cultivate crops and/ or raise livestock for sustenance or economic gain, and includes: 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

- Enhance dialogue between agriculture and wetland/environmental sectors to develop effective strategies for transitioning away from non-sustainable practices through changes to land and water use policies, institutional and financial frameworks.
- Develop policies to address the environmental problems that agricultural practices and systems create based on knowledge of the impacts of different types of agriculture (intensive, extensive, integrated) on inland, coastal and human-made and the benefits from implementing nature-based approaches that support agriculture and wetlands.
- Ensure policies prepared by water, agriculture, climate, and wetland/environmental sectors are coherent and consistent in promoting sustainable agriculture, the wise use of wetlands and delivery of Sustainable Development Goals.
- Apply transformative actions for sustainable agriculture and wetland wise use: i) increase efficiency in the use of resources and reduce excessive use of agrochemicals and over-extraction of water from wetlands; ii) protect wetlands by stopping their conversion for agricultural development and restore wetlands previously converted; iii) improve livelihoods and economic growth, including by promoting integrated and diverse farming systems; iv) enhance the resilience of people, communities and ecosystems; and v) adapt governance for enhanced cross-sectoral collaboration, working in partnership with the agricultural sector and local communities.

The issue

Wetlands perform critical functions in the landscape including by providing a wide range of ecosystem services. Wetlands support agriculture, by providing a source of water for crops and livestock, a habitat for aquaculture and rice production, and on fertile floodplains wetlands also support high agricultural productivity.

However, wetlands continue to be lost and degraded due to agricultural development. Across Europe, the Americas, Oceania, Asia and Africa, wetlands have been converted to agricultural land to support people's livelihoods and economic development, and this conversion is ongoing.

To be environmentally sustainable, agricultural practices should not adversely affect the ecological character of wetlands. Sustainable agriculture, by definition, "conserves land, water, and plant and animal genetic resources, and is environmentally non-degrading, technically appropriate, economically viable and socially acceptable" and is consistent with maintaining the ecological character[3] of wetlands and ensuring their wise use as defined by the Convention on Wetlands.

Policy-makers across the agricultural, water and environment sectors need to: (1) be aware of the different environmental impacts of a range of agricultural practices and systems (intensive, extensive, integrated) on inland, coastal and human-made wetlands and (2) have guidance on the specific policy responses needed to transform agriculture and ensure the wise use of wetlands.

1.7 billion people live in river basins under water stress[1]	**2.9 billion people** have an unsafe or risky water supply[2]	**20% of earth's land surface** is degraded[3]	**35% of the world's wetlands** have been lost since 1970[4]	**Increased agricultural production** is needed to feed people[5]
70% of all water extraction is for agriculture[6]	**9x more N-fertiliser** is applied compared to the 1960s[7]	**20-25% of global GHG** emissions are caused by agriculture and forestry[8]	**>50% of Wetlands of International Importance** are at risk of degradation due to agricultural practices[9]	**Conservation and sustainable development goals cannot be achieved** on current trajectories[10]

[1,2,3] UNCCD 2017, [4] Darrah et al. 2019, [5] FAO/IWMI 2018, [6] FAO 2011, [7] FAOSTAT, [8] IPCC 2014, 2019, [9] RSIS Database, based on analysis of RIS data from 2015 to November 2019 (n=567 Wetlands of International Importance) that omits earlier data that was incomplete or submitted in an earlier RIS format, [10] IPBES 2019

3 Resolution IX.1 Annex A, 2005: Ecological character is the combination of the ecosystem components, processes and benefits/services that characterise the wetland at a given point in time

Buffalo ploughing a human-made wetland. © Atsushi Tanabe

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

Wetland loss due to land conversion continues to be a global concern. Data available shows that around 35% of the world's wetlands have been converted to other land uses since 1970, with agriculture being one of the major drivers of change. Meanwhile human-made wetlands used for farming, such as rice paddies, have rapidly increased in extent.

Unsustainable 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.

The degradation of wetlands is context specific, but many wetlands throughout the world are under pressure, even including those supposedly receiving higher levels of protection. For example, more than half the Wetlands of International Importance are negatively affected by agriculture, with drainage (affecting 23% of sites), livestock farming (25%) and pollutants/ effluents (22%) identified as some of the major pressures (Figure 1).

Action is needed from policy-makers and wetland managers to evaluate the long-term consequences of unsustainable agricultural practices on wetlands, and wetland values need to be better integrated into policy responses related to land and water use.

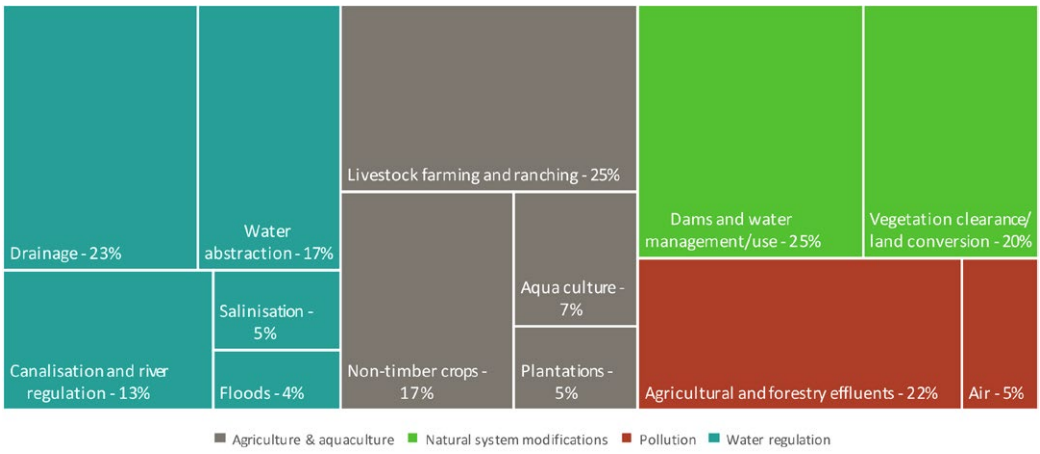

Figure 1. Agricultural threats to Wetlands of International Importance. Percentage (%) of Wetlands of International Importance negatively affected by agricultural practices (threats). Refer to Briefing Note 13 for further information.

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 to plant native forest species, helping to preserve the ecological character of the Wetland of International Importance.

Savannahs, flooded forests and the gallery forest of the Bita River Basin, Colombia.

Moving to sustainable agricultural practices

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

Better recognition is also needed of the role of wetlands in supporting agriculture. In well managed catchments, wetlands contribute significantly to regulating climate, water, nutrients, biota and soils: essential functions for sustaining agriculture.

In all forms of agriculture good management practices can be incorporated to maintain the ecological character of wetlands. To guide policy development, understanding is needed about the impacts of different agricultural practices on inland, coastal/marine and human-made wetlands (Table 1). Intensive agriculture is often dependent on high water use, and high inputs of nutrients and pesticides, which can degrade the ecological character of wetlands.

Kafue Flats, Tanzania, a Wetland of International Importance that supports biodiversity and people's livelihoods. ©Daniel Phiri

Table 1. How different agricultural systems influence the drivers of wetlands. Refer to Briefing Note 13 for definitions of intensive and extensive agricultural systems.

Anthropogenic drivers of change in wetlands		Agricultural system											
		a) Rainfed extensive	b) Rainfed intensive	c) Irrigated intensive	d) Horticulture		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	■					■						

There are many alternatives available to fit different situations and needs. Adapting agriculture to integrated production systems (e.g., crop-livestock-forestry-fish), or low input forms of agriculture (e.g., agroecology or regenerative agriculture) 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.

Building resilience of wetlands to climate change and increasing food demand

Integrated assessments have repeatedly demonstrated the explicit connection between improved food security, poverty reduction, environment sustainability and responses to climate change, including for wetlands. Maintaining the sustainable production of food and fibre from wetlands, reducing greenhouse gas emissions from degraded wetlands, and protecting biodiversity are all dependent on conserving the soil-water properties of wetlands.

Addressing global needs of 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. For example, instead of converting wetlands to address one outcome (food supply), and as a consequence increasing overall vulnerability of food security and people in the long term, 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. Policy makers and agricultural producers have a critical role in implementing these Nature-based Solutions (NbS) to enhance resilience in agriculture, while addressing climate change and enhancing wetlands.

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 more profitable) crop cultivation. Over a period of nine 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. ©SMBS-GLP

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 global environmental, sustainable development and climate goals will not be achieved. The implications for wetlands are profound. More than ever, the agriculture and environmental sectors must provide an integrated response to the increase in global food demand, while ensuring the wise use of water and wetlands.

The strategic goals of the Convention call on Contracting Parties to address the drivers of wetland loss and degradation, and to conserve Wetlands of International Importance effectively 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.

Waituna Lagoon, New Zealand, a coastal lagoon regularly opened to the sea to prevent inundation of low-lying livestock pasture. © Living Water Partnership

Building on the 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 2).

These actions encompass: Increasing efficiency in the use of resources, including reducing the excessive use of fertilizers and pesticides and reducing the over-extraction of water from wetlands; Protecting and enhancing wetlands, by stopping the conversion of wetlands for agricultural development and restoring degraded wetlands previously converted for agricultural use; Improving livelihoods and economic growth, by promoting integrated and diverse farming systems (e.g., crop-livestock-fish systems); Enhancing the resilience of people, local communities and ecosystems, including by adapting agricultural practices based on climate scenarios; and Adapting governance for enhanced collaboration across sectors and financial instruments that promote sustainable production, including mechanisms to avoid, mitigate and offset adverse effects on wetlands, working in partnership with the agricultural sector and local communities as well as consumers.

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, river-basin and site-specific scales 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. This includes further evidence on the benefits of integrated practices, including agroecology/natural systems practices, on wetlands. The solutions presented in case studies serve to illustrate examples of specific actions, but these solutions may not be suitable in other contexts.

Figure 2. Actions to transform agriculture to sustain people and ensure the wise use of wetlands. Adapted from FAO (2014), FAO (2018), van Dam et al. (2021)

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

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The Convention on Wetlands

The Convention on Wetlands is a global inter-governmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.