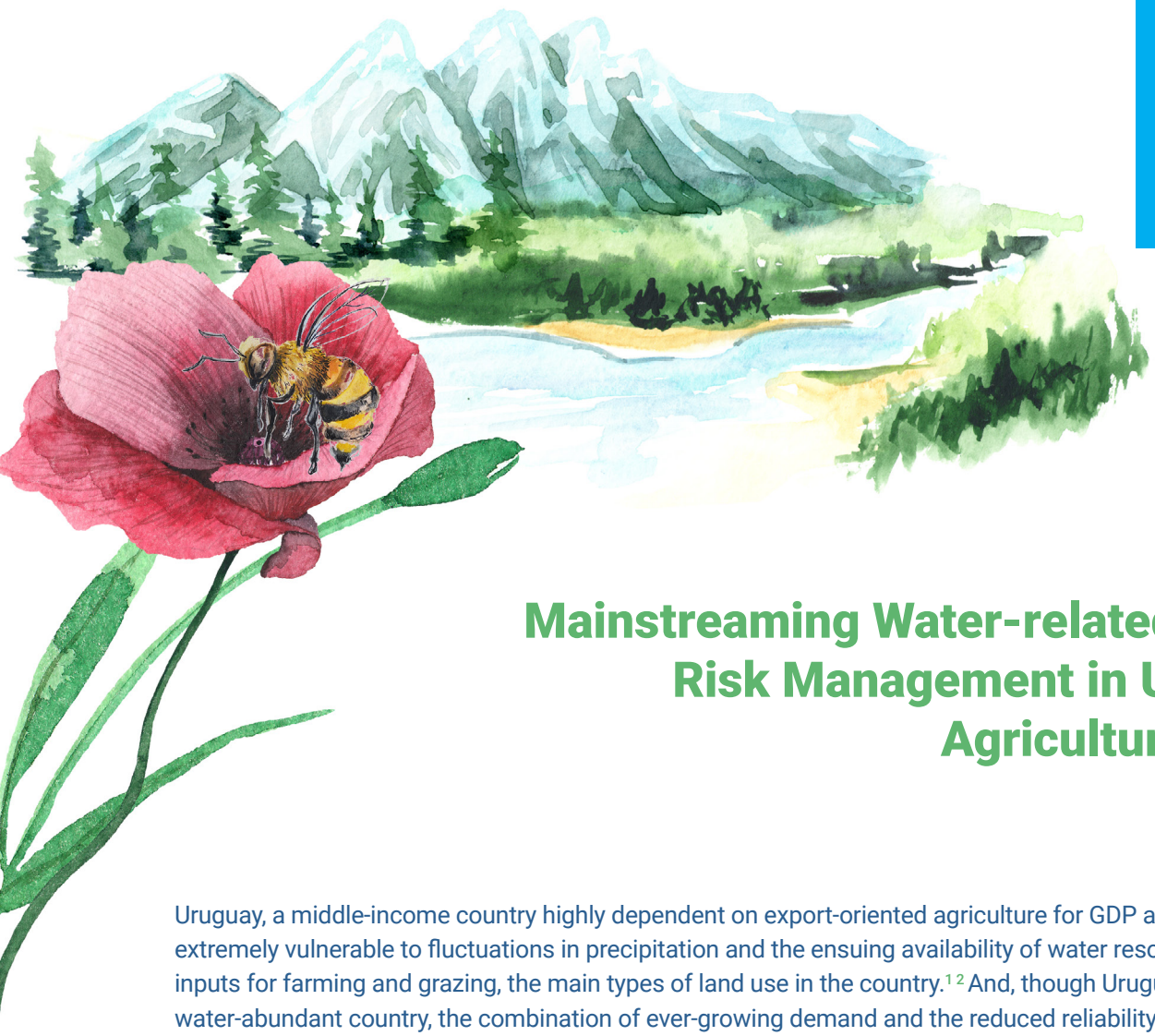

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Mainstreaming Water-related Climate Risk Management in Uruguay's Agricultural Sector

Uruguay, a middle-income country highly dependent on export-oriented agriculture for GDP and employment, is extremely vulnerable to fluctuations in precipitation and the ensuing availability of water resources needed as inputs for farming and grazing, the main types of land use in the country.[1] [2] And, though Uruguay is, in general, a water-abundant country, the combination of ever-growing demand and the reduced reliability of water supplies is threatening to lead to water scarcity (MVOTMA, 2017:232[3]).

In terms of specific climate hazards, drought and frosts produce the greatest losses in rain-fed agriculture (MGAP and SNRCC, 2019), but floods and heatwaves are also significant contributors while storm surges add to economic damage mainly along the coast. Perhaps most importantly, interannual climate variability is on the rise and, "although an increase in rainfall is projected, future, recurring water deficits are also likely to occur."[4] In other words, there may be more rain in the future but its arrival will be anything but predictable.

Already, erratic rainfall, drought and flooding have led to severe socioeconomic and environmental impacts, forcing Uruguyans to prioritize certain activities, reallocating available water from one sector[5] to another, depending on seasonal water availability (e.g., livestock, agriculture, energy production, transport, industrial uses and tourism). Of course, climate effects are not limited to the economy; forest ecosystems and related wildlife are subject to a greater incidence of fires while freshwater fish stocks have also suffered, in addition to a vast array of other impacts throughout the country.[6]

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1 Ministry of Livestock, Agriculture and Fisheries [MGAP] and National System of Response to Climate Change and Variability [SNRCC], 2019.

2 Ministerio de Ambiente de Uruguay (MA), 2021.

3 Most of the threats can be summed up as a combination of growing demand and variability in and/or a decrease in water supplies causing a shift from a state of abundance to one of scarcity.

4 (MGAP and SNRCC, 2019, p. 53)

5 To avoid any confusion, this document uses "sector" to refer to different parts of the economy related to climate change in general. Uruguay uses the term "sectors" for mitigation, and "area" for adaptation.

6 MVOTMA, 2017, p. 197.

Reacting to these trends, the government of Uruguay has begun to formulate sector- and area-specific lines of action in its **national planning strategy for adaptation** to manage water-related climate risks. For example, National Adaptation Plans (NAPs) are already available for agriculture, cities and coastal areas and are under development for the energy and health sectors. While all of these sectors depend on or are related to reliable water supplies, this case study will focus on agriculture, as it is by far the largest consumer of water and one of the sectors with the greatest vulnerability to climate change.

Uruguay's Adaptation and Integrated Water Resources Management Policy Framework

Uruguay has a number of national strategies and plans for formulating and implementing climate adaptation and water management measures.

The country's 2017 Nationally Determined Contribution (NDC), potentially the most important source of guidance for implementing its National Climate Change Policy, establishes integrated and sustainable watershed management as a core adaptation and water management approach. And, based on an exhaustive analysis and diagnosis of 11 priority areas for climate change adaptation, the NDC has developed a series of adaptation measures for sectors such as water resources, health, agriculture, disaster-risk reduction, urban infrastructure and biodiversity, among others. Regarding water resources, the most critical sector addressed by the NDC is agriculture, representing 5.8% of GDP and 80% of national water demand, which is where the National Adaptation Plan for Agriculture (NAP-Agro) comes in.

The NAP-Agro details the following measures to help this highly vulnerable sector manage climate risks:

- the climate resilience of agro-ecosystems;
- promoting the uptake of climate insurance;
- enhancing information systems, and technology development and transfer mechanisms;
- strengthening farmers' networks and organizations (i.e., institutional capacity),
- prioritizing knowledge generation and capacity-building; and, finally,
- continually refining adaptation policies and measures through research and analysis.[7]

The **NAP-Agro** also offers a roadmap for coordinating the different adaptation efforts in the agricultural sector. For example, it stresses the need for continuous capacity-building, enabling technical staff and policymakers to integrate risk management across Water Resources Management and Climate Change Adaptation. With this in mind, **NAP-Agro** uses a matrix of **32 indicators** for adaptation monitoring,[8] many of which stand out for their link to water resources and gender inclusion.[9]

An excellent example is the "Training in adaptation measures" indicator in the area of "Livelihoods". This gender-disaggregated indicator not only addresses climate variability and change in the framework of projects, programmes and policies, but also helps with the development of education and training programmes to reduce knowledge gaps between men and women. The NAP-Agro Action Plan's adaptation measure number 57, "Incorporation of actions for mainstreaming the gender approach in adaptation support policies", exemplifies this gender lens.[10] [11]

7 One example: A Cost-benefit Analysis on Intermittent Rice Irrigation in Uruguay, an adaptation measure with multiple co-benefits.

8 MGAP and SNRCC, 2019:118-125. Matrix based on the FAO guide (Tracking Adaptation in Agriculture Sector- Climate Change Adaptation Indicators).

9 See Uruguay's Gender and Climate Change Strategy for more information on how the country is addressing the climate impacts with a gender lens: https://www.gub.uy/ministerio-ambiente/politicas-y-gestion/genero-cambio-climatico-uruguay#:~:text=La%20Estrategia%20de%20g%C3%A9nero%20y,g%C3%A9nero%20de%20la%20pol%C3%ADtica%2C%20integrando

10 MGAP and SNRCC, 2019, p. 104.

11 For more details see: https://www4.unfccc.int/sites/NAPC/Documents/Parties/NAP%20Agriculture%20Uruguay.pdf

NAP-Agro's measures and approaches are bolstered by the National Water Policy (Law 18.610/009) and the National Water Plan 2010-2030 (NWP). The National Water Directorate (DINAGUA) began developing the NWP in 2010 with the aim of mainstreaming a set of key principles, including (i) integrated and sustainable water management, (ii) participation of water users from civil society organizations, (iii) incorporation of the concept of risk in water planning and management, and (iv) research, innovation and capacity-building along with environmental education.

Additionally, the NWP explicitly emphasises the adoption of Climate Risk Management Strategies (CRMS) for flood and drought. These CRMS include flood and drought risk mapping, zoning rules based on mapped flood risks, water harvesting and conservation practices, and institutional and technical capacity-building for implementing risk management activities, among others, in addition to climate scenarios.[12] CRMS allow data and knowledge to be incorporated into decision-making and planning processes in a more effective and tangible manner than relying on climate scenarios alone. Of course, climate scenarios are still part of this approach but they will be **downscaled climate scenarios**, reducing the high degree of uncertainty inherent in larger-scale climate projections. This CRMS-focused approach recognizes that, "In the long term, climate projections will inform decision-making regarding production practices and planning investments in resilient infrastructure." (MGAP, SNRCC, 2019:76)

What Can the World Learn from Uruguay's Approaches?

1. Strengthening (climate) risk management is key for all sectors, but **CRMS must be used along with IPCC's predictive climate models or global and regional circulation models (CGMs/RCMs)**, despite the challenges associated with data availability and downscaling. And, in the case of Uruguay, integrated water resources management is central for effective CRMS not only in NAP-Agro but in all the NAPs. For instance, adaptation measure number 4 in NAP-Cities refers specifically to incorporating CRMS in the planning processes across a range of public services such as sanitation, storm drainage and drinking water to reduce vulnerabilities, a precept of IWRM.[13] Similarly, in NAP-Cities, IWRM and urban flooding are explicitly mentioned key principles and concepts.[14]
2. Countries usually assess the vulnerability of each sector separately, **but the key to true risk management and resilience lies in generating a multisectoral vision**, and IWRM for adaptation may just be the best vehicle for doing this, as water literally flows through and links every sector. With regard to agriculture in particular - one of the main drivers of the country's economy, and source of livelihood security for a large portion of the population - CRMS with sufficient hydrological, climatic, and other monitoring data to support decision-making in order to provide accurate and timely climate information and forecasts (daily, seasonal, etc.) will be of utmost importance. This includes identifying methods and tools (e.g., Early Warning Systems) that can help strengthen public policy formulation, enhance production systems' adaptive capacity, and improve the development of databases, information-sharing platforms and other instruments that optimize the use of climate information.[15]
3. Uruguay's NAPs and other tools related to the "National Climate Change Response System" regularly report on the range of public and private institutional actors that have helped integrate adaptation planning at the national level, and the sheer number of actors is proof of how well different sectors and government ministries and agencies are working together.[16] This cooperative effort has been facilitated by Uruguay's institutional framework, to some extent,

12 For more details, please see the NWP's chapter on water-risk management: https://www.gub.uy/ministerio-ambiente/politicas-y-gestion/programas/programa-3-gestion-del-riesgo-hidrico

13 MVOT and MA, 2021a, p. 116; 125; 125.

14 MVOT and MA, 2021b, p. 28.

15 MGAP and SNRCC, 2019, p. 119.

16 Within the adaptation measures in the Action Plan to 2025 there are different projects in diverse areas such as production systems (No. 23, 24 and 25), Livelihoods (43 and 46), institutional capacities (No. 48, 49, 55, 56, 57, 59, 60, 61, 62 and 63). To see details of the projects, consult the document here.

but mainly by **a dynamic and open intersectoral dialogue process, helping to create shared visions and objectives, linking sectoral and institutional processes, and fostering a sense of intersectoral collaboration stretching from the national to the local level.**

4. **Institutional arrangements do indeed work, but only once they have had sufficient time to become consolidated, having generated trust across the different institutions involved and thus widespread willingness to contribute to adaptation initiatives.** For instance, in the "Institutional capacities" dimension of the Action Plan (2025), agricultural policy institutions are identified as key to the development of sustainable production systems adapted to climate variability and change. A prime example of this comes from the ongoing "Strengthening institutional capacities for the monitoring and evaluation of land uses and status" project, which promotes the strengthening of capacities and institutional arrangements for carrying out regular land monitoring and designing public policies.[17]

Despite Uruguay's successes at mainstreaming water-related concerns in its national strategies and climate planning, many challenges remain with respect to institutional arrangements and the enabling environment for adapting agriculture to climate change. Above all, inter-agency coordination is one of the pillars of IWRM and climate change adaptation that must be further strengthened.[18]

For instance, as part of the adaptation measures included in the NAP-Agro Action Plan to 2025, an enabling environment for the participation of the different institutions related to agriculture is considered essential for designing adaptation policies and tools aimed at fostering climate-resilient production systems.[19] Fortunately, the National Water Plan and the different NAPs that prioritize IWRM as a principal adaptation strategy represent a major opportunity for enhancing institutional arrangements and coordination among key institutions in the country.

17 (MGAP and SNRCC, 2019, p. 101).

18 Indeed, Uruguay's National Climate Change Response System, coordinating NAPs, other climate-related policies and tools, the national and provincial ("departamentos") governments, academic institutions, and civil society, is hard at work in this regard.

19 (MGAP and SNRCC, 2019, p. 105).

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