WaterLANDS

Deliverable 3.1. Characterising supportive governance and policy

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1. Executive summary

The literature review conducted as part of this work to explore the conditions for successful governance has revealed a long list of recommendations for improving current governance systems. Although they have been formulated in various contexts (e.g. governance of natural resources, Mediterranean coastal wetlands and protected areas) their general concepts can be easily adjusted, transferred and applied to most wetland restoration projects. Moreover, additional specific recommendations emerge from the analysis of governance success and limiting factors reported by the WaterLANDS Knowledge Sites (KS).

The 25 recommendations provided in the Theoretical Governance Framework, complemented by more than 50 possible concrete actions and more than 20 examples of good practices from KS, are a tool to support the implementation of the three Pillars of the ideal governance framework built in this deliverable.

The selected approach to analyse governance systems in the WaterLANDS KS included two steps:

1. ***An in-depth analysis of governance for a first selection of KS***
2. ***A general overview of the additional KS of the WaterLANDS project***

The KS analysis revealed the presence of heterogeneous models of governance, mainly due to different geographical features of the sites (e.g. areal extent), different land ownerships (private land, state land) and different history of sites (change in land use and related anthropogenic pressures, past successful or detrimental experiences of management). Restoration emerged due to different factors. Drastic land-use change (from commercial exploitation to ecological restoration and conservation) has been quite relevant for various KS and marked a decisive change in their governance.

The main human threats that affected wetlands within the KS were related to the poor recognition of their ecological value in the past, with the most severe impacts occurring in the last century. The degradation of wetlands was exacerbated by general low awareness of their ecological functions. A major challenge associated with socio-ecological governance is rooted in the disconnection between those who culturally value ecosystems and those who have authority in an environmental governance domain (Hirons et al., 2016). Climate change is another issue that is common to different KS and which is becoming increasingly relevant. Governance systems analysed in different KS are very heterogeneous, having highly specific features that fit each context. To trace the variability of observed systems to a limited number of categories, the deep analysis made for the first group of 6 KS led to four main categories of governance models: Polycentric model; Monocentric (top-down) model; Community-based model; Networking model.

2. Introduction

Wetlands

Wetlands are amongst the most dynamic ecosystems on Earth: freshwater wetlands are home to 40% of the world's species, are of crucial value to biodiversity, including as habitats for many specialist or migratory species (Wetland-based Solutions, 2020). They maintain ecological processes that provide for key ecosystem services, including water storage and aquifer recharge, water quality regulation and the assimilation of pollutants and excess nutrients, the deposition of excess sediment and the capture and long-term storage of carbon. The most significant European wetland habitats in terms of carbon storage include well-functioning salt marshes, healthy mires, peatlands (bogs & fens) as well as riparian, fluvial and swamp forests. Scientists estimate that up to 87% of wetlands were lost between 1700 and 2000, predominantly inland. Recent losses are mostly coastal and have been even faster, declining by 31% between 1970 and 2008 (WWF, 2019).

Drivers of wetland degradation

Land-use change is the biggest driver of the degradation of inland wetlands since 1970. Wetland areas continue to decline, with ongoing conversion and losses in all parts of the world. Wetland biodiversity losses are mostly due to this land use change and are projected to continue to increase. Since 1970, inland wetland-dependent species have declined far more than species dependent on other biomes, and an increasing number are facing extinction (Global Wetland Outlook: Special Edition, 2021).

The Black Sea and Mediterranean regions show the highest rates of relative wetland loss in Europe (Maes et al., 2020). In addition to wetlands lost already, the increasing aridity trend projected for the Mediterranean areas under the current global change scenarios (Barredo et al. 2016) will surely generate new losses, posing further conservation challenges. Coastal wetlands (suffering from sea level rise), arctic and mountain wetlands (due to cryosphere shrinking) are the ecosystems most at risk (Ramsar Convention, 2021).

The lack of a comprehensive European policy framework targeting these ecosystems in a consistent manner, the mis-definition and misrepresentation of wetlands in different classification systems, and inadequate impact assessment of wetland ecosystems prior to changes in land use are among the main causes of wetland degradation recognised at the European level (Biodiversity information System)[3].

Report objectives

In the context of the WaterLANDS project, this report analyses the importance of governance in successful wetland restoration. It is based on a comprehensive literature review, analyses of the project's KS experiences, analyses of various EU-funded projects experiences and a mapping of key local, regional, national and EU policies undertaken by the authors, with contributions from the members of Work Package 3 of the WaterLANDS project and an external expert from the consultancy

[3] https://biodiversity.europa.eu/ecosystems/wetlands

Thetis, an engineering and consultancy company based in Venice, Italy with expertise in coastal wetlands restoration, planning and management, science-to-policy and science-to practice-projects. Finally, this report provides a theoretical governance framework for successful wetland restoration based on all of the abovementioned outputs.

The overall objective of this report is to **support decision makers, local communities and restoration practitioners to intensify cooperation towards the large-scale restoration of wetlands in Europe.** To do so, it zooms **in on the governance conditions and measures taken across the network of WaterLANDS KS** which are sites where wetland restoration has already happened, generating knowledge. Lessons learned from their experiences can contribute to our understanding of what successful wetland restoration is all about.

In this analysis, we discuss the crucial roles of governance in wetlands restoration which are key to guide fit-for-purpose EU Green Deal policies. Good governance practices in terms of wetlands restoration can help accelerate upscaling across the EU and yield insights into the governance of other domains related to nature-human interactions, where informed discussions amongst and between local communities, stakeholders and decision-makers, are necessary to decide on the future of a given area and the embedded landscape, its biodiversity, carbon stocks/balances, ecosystem services and its resources.

Why aligning governance is crucial

Aligning governance is about the long-term perspective and requires us to overcome weak and fragmented governance systems and improve participation and democracy. Better policies and integration of knowledge/best practices based on lessons from wetland restoration are needed to identify innovative policy and governance pathways that support large-scale wetland restoration.

In light of the threats to the integrity and health of wetlands, it is crucial to understand how wetlands can be restored and how upscaling can take place. This is the ultimate objective of the WaterLANDS Project. The project convenes a network of Action Sites (AS) and Knowledge Sites (KS). In a nutshell, the AS's represent the project's restoration upscaling targets, based on the best practices and knowledge generated by the KS.

3. Defining successful ecological restoration for governance

Ecological restoration has been defined along a broad spectrum ranging from definitions that focus on the actual ecological state of a degraded area to more broad-ranging ones which bring in the human factors that can either enable or inhibit restoration.

In 2004, the Society for Ecological Restoration proposed the following definition: "Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed" (SER, 2004). This process notably involves restoring crucial ecosystem functions and characteristics, such as soil properties, water chemistry and biotic composition as well as the hydrological dynamics of a site. Other early definitions of ecological restoration usually homed in on the mobilisation of scientific data to restore ecosystems that were perceived as degraded so as to restore them to a functional state, or at least one that preceded (most often anthropogenic)

degradation. In this sense, restoration was successful if a functioning system was achieved in line with a set of desired restoration goals (Kentula, 2000). Other authors also emphasized the need for restoration to result in a robust, self-supporting system (Giller, 2005; Ruiz-Jaen and Aide, 2005) or a healthy and self-sustaining system (Palmer et al., 2005).

The term ecological restoration has also often been used in a rather broad and vague way to designate the process of bringing a site, place or ecosystem 'back' to something considered as 'original' or, more precisely, to 'pre-disturbance' conditions, be they anthropogenic or natural (Van Andel et al. 2012). Here, the question of perception is paramount. Although scientific data and observations may indicate that a site is degraded and should be restored, the question of knowing how, to what state and by whom, is a human affair: "Ecological restoration is the process of restoring one or more valued processes or attributes of a landscape" (Davis and Slobodkin, 2004). In this sense, common values are implicitly used to set restoration goals, and can comprise social, environmental, economic, cultural, moral, political, or religious aspects. Successful restoration should therefore result in the provision of goods and services that people value (Martin, 2017). Because restoration is necessarily context-specific, it is also crucial to learn lessons from previous experiences and transfer that knowledge while seeking to establish general principles. Palmer et al. 2005 propose five of them: guiding image of dynamic state, ecosystems are improved, resilience is increased, no lasting harm, ecological assessment is completed. Successful restoration therefore also contributes to existing scientific knowledge and restoration management practices (Palmer et al. 2005).

It is apparent that numerous human factors come into play when it comes to restoration, which is why some authors have proposed more all-encompassing definitions: "Ecological restoration is the total set of ideas and practices (social, scientific, economic, political) involved in the restoration of ecosystems" (Hobbs, 2004). It is thus necessary to take human aspects into account (Shackelford et al. 2013; Wortley, Hero, and Howes 2013). Indeed, ecological restoration is developed and implemented by the involvement and interaction of multiple actors working at multiple levels and scales with differing interests, creating dynamic governance contexts (Richardson and Lefroy 2013). Moreover, the restoration process may affect the interests of these actors positively or negatively. Involved and impacted actors also need to be aware of the ecological restoration outcomes that will be produced, as this can determine their involvement and cooperation or lack thereof during the process (Palmer et al. 2005).

The definition proposed by the UN Decade on Ecosystem Restoration's definition is broad:

> "Ecosystem restoration means assisting in the recovery of ecosystems that have been degraded or destroyed, as well as conserving the ecosystems that are still intact. Healthier ecosystems, with richer biodiversity, yield greater benefits such as more fertile soils, bigger yields of timber and fish, and larger stores of greenhouse gases. Restoring ecosystems large and small protects and improves the livelihoods of people who depend on them. It also helps to regulate disease and reduce the risk of natural disasters."

The objective of restoration is to emulate a self-regulating natural system that is ecologically integrated into the landscape in which it occurs. Wetland restoration can have multiple benefits

including biodiversity conservation, climate change adaptation and human well-being. These benefits can be both collective and individual, impacting personal, ecological, cultural and socio-economic values. The type of restoration chosen for each site will be dependent on the actual state of the wetlands, the projected reference state and potential management options (Wetland-Based Solutions, 2020).
The question of how humans can achieve these objectives, as we will now see, is closely interlinked with governance.

4. Governance for successful wetland restoration

Governance is a crucial and determining factor for sustainable development and natural resource management and conservation. There is growing recognition that governance significantly conditions both the effectiveness of conservation efforts and the extent to which conservation contributes to human well-being (Springer et al., 2021). Successful natural resource management relies not only on science-based ecological restoration techniques, but also on a cooperative environment that requires working with different stakeholders, meeting deadlines, securing funding, supervising staff, and engaging with politicians (Gumiero et al., 2013). Indeed, socio-economic and governmental systems, rather than the environmental domain, were identified as the main obstacles to successful ecological restoration in Europe. Conflicting interests among different stakeholders are recognised to be among the major factors that hinder restoration, together with the lack of funding and low political priority given to wetland issues (Cortina-Segarra et al., 2021).

In the two following sections, some insights about the concept of governance (definitions, pillars, principles and added values) are described, the three proposed pillars in this report are briefly introduced along with some existing mechanisms which can be put into practice to support wetland restoration.

4.1 WaterLANDS pillars, governance definition, principles and added values

The IUCN defines Natural Resource Governance as the norms, institutions and processes that determine how power and responsibilities over natural resources are exercised, how decisions are taken, and how citizens — including women, men, youth, indigenous peoples and local communities — participate in and benefit from the management of natural resources (Springer et al., 2021).

Power over wetland restoration resides in water management and governance and whether land uses are compatible with natural, semi-natural or artificial wetlands. The Global Water Partnership (2003) specifically defines *water* governance as follows: "Water governance refers to the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society." Through this definition, we can see the emphasis on the ability to design public policies and institutional frameworks that are socially acceptable and that must incorporate sustainable development of water resources.

Based on a review of several global assessment frameworks on governance in natural resource sectors, case studies, dialogues, regional analyses and workshops, the IUCN has defined ten core

principles (or key elements) of governance. These ten principles compose the Natural Resources Governance Framework (NRGF), a knowledge product created as a tool to improve governance for equitable and effective conservation. The NRGF can be applied to wetlands since its criteria have been intentionally kept general for use in different contexts and for different types of natural resources. Based on those principles, six benefits of good governance of wetlands have been identified by PAP-RAC (2019) as highlighted below.

Six benefits of good governance of wetlands	
6 benefits of good governance	**Description**
1. Gaining legitimacy and giving voice	Enjoying broad acceptance and appreciation in society; ensuring rights of access to information, participation and justice; fostering engagement and diversity; preventing discrimination; fostering subsidiarity, mutual respect, dialogue, consensus and agreed rules
2. Providing direction	Following an inspiring and consistent strategic vision grounded on agreed values; ensuring consistency with policy and practice at various levels; ensuring clear answers to contentious questions; ensuring proper adaptive management and favouring the emergence of champions and tested innovations
3. Optimising performance	Achieving conservation and other objectives as planned; promoting a culture of learning; engaging in advocacy and outreach; being responsive to the needs of rights holders and stakeholders; ensuring resources and capacities and their efficient use; promoting sustainability and resilience
4. Being accountable	Upholding integrity and commitment; ensuring appropriate access to information and transparency, including lines of responsibility, allocation of resources, and evaluation of performances; establishing communication avenues and encouraging feedback and independent overseeing
5. Sharing the benefits, minimising the costs	Equitably sharing costs and benefits, without adverse impact for vulnerable people and communities; upholding decency and the dignity of all; being fair, impartial, consistent, non-discriminatory, respectful of procedural rights as well as substantive rights, individual and collective human rights, gender equity and traditional rights, including free, prior and informed consent; promoting local empowerment
6. Keeping all parties happy, inspiring their continued support, not as a duty but as a sincerely held desire.	

An even simpler definition of governance is proposed by PAP-RAC (2019) in its Governance Handbook for Mediterranean wetlands: "who holds *de facto* power, authority and responsibility to take and implement decisions". The definition also refers to the quality of governance, namely "how effective and efficient decisions are, and how accountable". It is thus understood as a long-term and often non-linear process, closely related to, but distinct from the concept of management. Governance drives the management of wetlands, but, in its turn, management informs this governance in a continuous and iterative learning and adjusting process. The handbook also paints a rather grim image of how governance is perceived: "governance is often seen as an arcane and self-serving process, and may be treated with world-weary resignation or even suspicion. Certainly, it will involve that most ubiquitous of institutions - the committee in one form or another." If this view is representative of the way restoration practitioners think about governance, it seems that there is much work to be done to establish an idea of governance that facilitates restoration and enhances democracy. To address this, the handbook also introduces some interesting governance concepts, such as wise, vital and adaptive governance.

Moreover, within the UN Decade on Ecosystem Restoration (2021-2030), general principles for ecosystem restoration are described by the FAO, IUCN CEM and SER (2021), while practical approaches for landscape restoration are offered by the 4 Returns Framework. The 4 Returns Framework connects ecology, community values, spirit and culture, business and long-term economic sustainability at landscape level. It allows government, business and communities to co-create and deliver a common vision for a resilient landscape (Dudley et al., 2021):

- It is a conceptual and practical framework to help stakeholders achieve 4 RETURNS (inspiration, social returns, natural returns, financial returns);
- by following five processes (5 Elements: a landscape partnership, shared understanding, landscape vision and collaborative planning, taking action and monitoring and learning);
- within a multifunctional landscape (3 Zones: natural, combined and economic zones);
- with this transformation taking place over a realistic time period (Minimum 20 years)

The above frameworks are fully embedded in the 3 pillars proposed within this report in order to analyse governance landscape in the project KS.

The pillars are built on the literature review and the abovementioned conceptual frameworks within this report. They were developed and organised in a simple way to gather elements which contribute to effective, fit-for-purpose governance of wetland restoration efforts. Three pillars are proposed, which encompass the different steps of governing wetlands, including elements of transformative governance for successful wetland restoration. Finally, the pillars try to reflect WaterLANDS core components, such as co-creation and sustainable legacy:

1. **Co-creation and communication:** This Pillar describes the process by which an ecosystem restoration effort is governed, designed and implemented in such a way that all of the stakeholders and groups that are affected by the restoration project effectively and continuously participate in its creation.

2. **Design and Implementation:** This Pillar designates both the formal and informal governance procedures and practices that are put in place in the context of an ecosystem restoration effort. The pillar describes the key organisational measures that can contribute to the establishment of a "Safe Operating Space" for ecosystem restoration.

3. **Sustainable legacy:** This represents the cornerstone of good governance that conditions the success of restoration efforts. This Pillar encompasses the governance procedures and safeguards that can be implemented in order to ensure that an ecosystem restoration effort's material and immaterial results endure.

Principles, added values and features of Governance

The ten principles of good governance of natural resource (Springer et al., 2021)

- Inclusive decision making
- Recognition and respect for tenure rights
- Recognition and respect for diverse cultures, knowledge and institutions
- Devolution
- Strategic vision, direction and learning
- Coordination and coherence
- Sustainable and equitably shared resources
- Accountability
- Fair and effective rule of law
- Access to justice and conflict resolution

Added values for good governance of wetlands (PAP/RAC, 2019)

1. Gaining legitimacy and giving voice
2. Providing direction
3. Optimising performance
4. Being accountable
5. Sharing the benefits, minimising the costs
6. Keeping all parties happy and inspiring their continued support

Features of Governance, towards Excellence (PAP/RAC, 2019)

- Empowered
- Wise
- Adaptive
- Creative, innovative and lively
- Representative and integrated

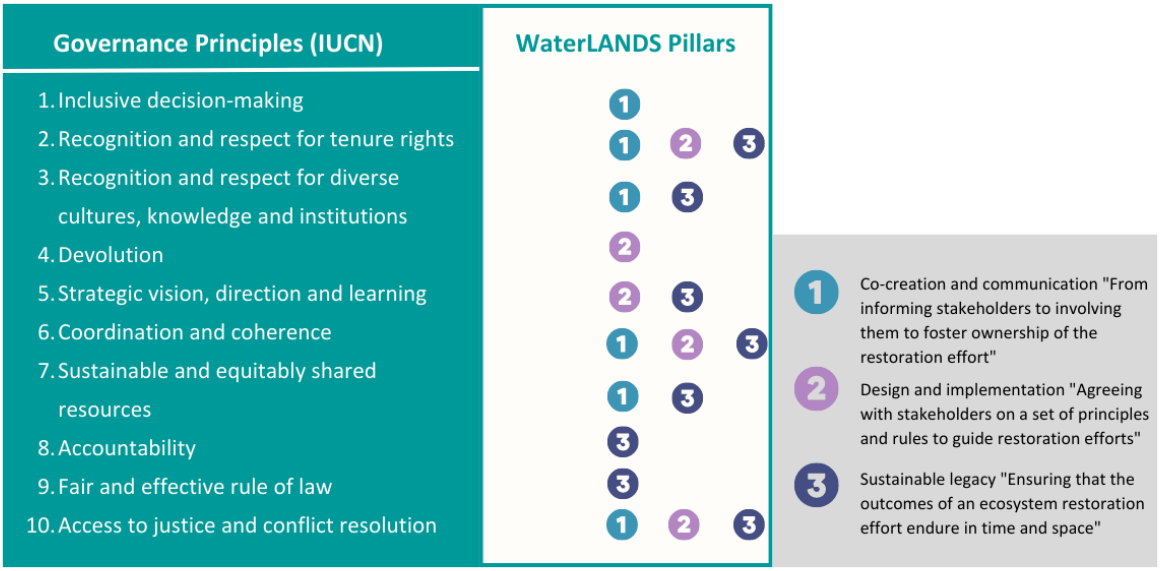


Figure 4.1 - WaterLANDS pillars and their relationship with the IUCN's governance principles

4.2 Governance in practice

There is a considerable body of literature that is relevant to different aspects of governance for wetlands. Several documents, though not specifically addressing wetlands, refer to similar sectors (management of natural resources) or strictly related systems (protected areas, water management).

As observed for protected areas (IUCN, 2013), governance takes place at several levels that often interact with each other. Interactions can be horizontal (through collaboration and exchanges between different government departments or economic sectors) or vertical (through hierarchy). Moreover, multi-level governance can take place through formal (e.g., by law or legal contracts and agreements) or informal (e.g., because of relationships and trust) channels.

Although much has been written on Governance, it risks remaining an elusive concept if not implemented in practice. However, there is a considerable amount of experience on how theoretical principles and values of governance are translated into operational mechanisms and real-life examples.

Voluntary Environmental Contracts

Voluntary environmental contracts are tools that are being used to practically apply governance principles to the management of rivers, marine protected areas and wetlands. They are established on a voluntary basis but they are formally adopted (signed by all partners) and binding in terms of liability, financing, and timing. Both public and private actors can be the signatories to such contracts.

These contracts are negotiated, multi-level agreements between different parties to proactively manage a system through an inclusive and deliberative decision-making process (Interreg Med TUNE UP, 2021). The contracts are centred on a shared vision of the territory that takes into account an intersectoral approach. The basic idea is that the differences in knowledge among stakeholders are

opportunities to change from a condition where conflicts prevail and hinder successful restoration actions to a new condition, where collaboration creates a shared learning process. In this regard, "social learning" "knowledge co-creation" and "convergence of goals" are based on the involvement of multiple stakeholders (Collins, 2014).

Environmental contracts have been initially proposed and tested in some European countries (e.g. France, Belgium, Italy). They have been further encouraged at the Mediterranean level for wetlands within the Interreg Mediterranean WETNET project (coordinated management and networking for Mediterranean wetlands 2016-2019) and for marine protected areas within the TUNE UP project (Promoting multilevel governance for tuning up biodiversity protection in marine areas, 2019-2022). The Interreg CREW project (Coordinated Wetland management in Italy-Croatia cross border region, 2018 - 2021) applied the voluntary wetland contract tool to the Adriatic region.

The environmental contract overall approach is based on vertical and horizontal collaboration in order to achieve effective coordination among institutions at all levels by integrating funding, planning tools and human resources while limiting conflicts between preservation and economic issues.

Contracts cover strategic issues (construction of shared scenarios and common vision), organisational issues (establishment of a system of rules formally subscribed by participants) and operational issues (development of an action plan to concretely implement restoration measures).

Legal constraints can limit the possibility to actually establish Contracts in some countries, especially whenever they are not envisaged by any national law. TUNE UP and WETNET results suggest that possible solutions can include the establishment of intermediate steps such as a "Memorandum of Understanding", or "Memorandum of Collaboration". However, these agreements do not have financial commitment for the signers, nor budget provisions, so their strength is lower (Interreg Med TUNE UP, 2021). Indeed, the effectiveness of environmental contracts depends on how they are actually implemented, monitored and periodically re-assessed (Moore & Rutherfurd, 2019).

Maristanis (Sardinia region, Italy) – a wetland contract approach

The Oristano Coastal Wetlands Contract is a voluntary act of shared commitment to improve the protection and implement an integrated management plan of the wetlands in the Gulf of Oristano (Ramsar and Natura 2000 sites).

The legal basis of this tool can be found in Italian environmental law (Legislative Decree 152/2006, transposing and implementing the EU directive 2000/60/EC) and at the local level, in the Regional guidelines for the activation of the River Contracts, adopted by the Autonomous Region of Sardinia in June 2019. These guidelines provide information on legal, regulatory and management aspects of the Contract. The process began in 2017 with the beginning of the MARISTANIS project on the Integrated Management of the six Ramsar Areas of the Gulf of Oristano, co-funded by the Swiss Foundation MAVA for Nature and coordinated by MEDSEA.

After a first declaration of intents signed by the different municipalities of the area (2019), the Action Program of the Contract was defined, the Contract was signed (2021) and a Coordination Group was established by the signatories of the Contract, which are recognised as political decision makers and coordination officers. A 6-month participatory process began. It included the organisation of meetings with associations, economic

sectors and the population in the whole territory of the Maristanis Area.

The Contract intends to implement a multidisciplinary and concerted policy action that involves all stakeholders towards effective management and sustainable development of the territory. This will facilitate the alignment among the various plans and programs that frame the governance and management of this coastal wetland.

The action programme is fully part of the Wetland contract and is organised along seven strategic axes:

- Participatory governance;
- Landscape restoration and valorisation of the cultural heritage;
- Green economy, towards a model of sustainable development;
- Strengthening of resilience and adaptation to climate change;
- Communication and environmental awareness raising.

For each strategic axis, the Action Plan identifies the responsible actors and the timeline for the implementation of the measures.

Source: PAP/RAC, 2019; http://www.maristanis.org/

Public–private partnerships

Public-private partnerships (PPP) are long-term agreements between the government and a private entity to provide goods and services to the public, where both parties share management responsibility and risks. In the broad meaning of this term, public-private partnerships can take different forms. When implementing a riparian restoration project, a contract with private partners can be necessary to agree on possible land use changes. In fact, restoration projects can involve land acquisition from private actors or preclude some incompatible uses commonly practiced in the area (e.g. intensive agricultural or cattle grazing uses). In France, the so-called *obligation réelle environnementale* (ORE) is an agreement or contract between two parties applied to specific ecosystems. This type of tool has already been used for wetlands. Property owners may conclude a contract with a public authority, public institution or private legal entity acting for the protection of the environment, for a duration up to 99 years. Since they are real obligations (as in real property), ORE will last no matter if the land is being sold or not, which distinguishes them from regular agreements. The purpose of the ORE contract as stipulated by the Environmental Code is "the maintenance, conservation, management or restoration of elements of biodiversity or ecological functions" (Environmental Code, Article L. 132-3)

The PPP partnership approach is being pursued in floodplains throughout northern Europe (Gumiero et al., 2013). The "room for the river" approach promoted by the Dutch government since 2007 is aimed at restoring the river's natural floodplain to protect areas at major risk of flooding. Dykes are being relocated further inland and new areas (including agricultural areas) are being more frequently voluntarily inundated under controlled conditions, to create or restore wetland ecosystems able to mitigate flood risks.

A balance between habitat conservation, farming needs and safety from floods is at the foundation of this approach. When the overall national/regional/local government strategy and long-term vision is

not fully shared with key stakeholders, farmers can claim inadequate consideration of their views and perspectives in a process that allows the government to use their land, for example for temporary flood-water storage. Landowners are called upon to use their property for providing an important service, but if they have not been involved in the design of the flood management strategy and the associated operating rules, they might not support this action. Conversely, the cooperation of local and regional authorities with other institutions and actors in related sectors (agriculture, fishery, forestry, sports/tourism, business, NGO, etc.) has proven to be a valuable tool in achieving biodiversity objectives, while participatory systems of government have been highlighted as essential to successfully implement regional and local biodiversity strategies and action plans (McKenna et al., 2014).

The concept of Ecosystem Services (ES) has opened more possibilities for cooperation between different agencies, filling the gap for an integrated approach to environmental issues. Good ecosystem condition is particularly linked to the provision of regulating services. It is also linked to the delivery of provisioning and cultural ecosystem services under moderate use intensity (MEA, 2005). For example, biologically diverse agricultural ecosystems in good condition can provide provisioning services for food and other agricultural materials in a sustainable way. They can also provide a range of regulating and supporting services, some of which are essential for agricultural production, such as pollination, soil formation, natural pest control, regulation of climate, nutrients and the water cycle, and carbon storage in soil and biomass. Finally, they can provide cultural services from traditional rural landscapes and habitats for biodiversity. The four identified categories highlight the need for cross-sectoral cooperation and PPP in order to bring different expertise and knowledge.[4]

Different types of participatory processes

Public participation can be any process that directly engages the public in decision making and gives full consideration to its contributions. Through public participation, stakeholders have the opportunity to be actively involved in governance processes, influencing major and minor decisions. Three different levels of participation (ECNL, 2016) can be identified: (1) access to information (the public is informed about the issues, options and solutions); (2) consultation (the public's feedback on alternative solutions is gathered); and (3) active involvement (development of partnerships, permanent committees, working groups where different actors participate in the decision-making process). Public participation plays an important role within environmental management as it is legally required, for example, as part of environmental impact assessment and strategic environmental assessments (Schernewski et al., 2017) although it is not always done. Several benefits of public participation in restoration actions have been recognised (e.g. reducing conflicts, creating trust, providing a sense of ownership or responsibility). However, a significant body of literature has also explored inefficiencies and trade-offs (additional cost, prolonged time to conclude the actions), revealing that, while public participation is a necessary element for successful restoration projects, it

[4] EU guidance on integrating ecosystems and their services into decision-making: https://ec.europa.eu/environment/nature/ecosystems/pdf/SWD_2019_305_F1_STAFF_WORKING_PAPER_EN_V2_P1_1042629.PDF

is not a sufficient condition (Eftec, 2017). Especially in complex restoration projects, keeping participation at the lower levels (only ensuring access to information and involving actors in consultation processes) revealed itself to be an insufficient condition, demonstrating a need for more collaborative mechanisms where stakeholders have a more active role in decision making. The establishment of a governance committee that represents key partners and stakeholders is considered a common step (PAP/RAC, 2019).

Transboundary governance actions

While the governance of wetlands is mainly a national or subnational issue, international and transboundary issues may arise when a wetland is part of a wider area, or catchment that is shared between neighbouring countries. Relationships between neighbouring governance bodies need to be established (PAP/RAC, 2019). Cross-border and transnational cooperation, taking the form of multilateral/bilateral/transnational agreements, may therefore be essential components of wetland governance for successful restoration. As with the transboundary governance of protected areas (IUCN, 2013), transboundary governance for wetlands presents unique challenges, as this typically involves and affects many parties. Governance involves at least the main management bodies of the two countries that share the wetland. However, depending on the size of the area, governance may also involve several national, provincial, district or local authorities, as well as indigenous peoples, local communities and private landowners.

Prespa Lakes, a transboundary park

Encompassing two lakes, the transboundary Prespa basin is located in an area of the Western Balkans that is shared by three countries: Albania, Greece and North Macedonia. The lakes are part of the same ecologic system because of their hydrological connection and proximity.

In 1990, after a period of conflicting opinions about conservation actions among the various stakeholders, the Society for the Protection of Prespa (SPP) was founded as an umbrella NGO bringing together ten environmental organisations. By the end of the 1990s, the Prespa basin started to be managed in a coordinated manner across the borders of the three neighbouring countries. This transboundary collaboration materialised with the Declaration on the establishment of Prespa Park, issued by the three countries' prime ministers under the auspices of the Ramsar Convention. Over the following years, an informal multi-stakeholder Coordination committee for Prespa Park was established on the initiative of different actors from the Ramsar Convention and MedWet, with the support of various NGOs across the three countries. This informal structure was composed of representatives of the national environmental authorities, local authorities and NGOs. It worked for nine years under its Secretariat (the Society for the Protection of Prespa). The committee offered a platform for trilateral dialogue between different parties of the three countries, trust creation, exchange of information and convergence of different views.

In 2010, the three ministers of the environment and the European Commission (EC) signed the International Prespa Park Agreement, a legally binding agreement that only started to operate in 2021 due to long lasting political problems and to low priority assigned to biodiversity in the political agenda. During the decade of institutional stagnation, three NGOs continued to collaborate establishing a permanent network (PrespaNet) that elaborated a Transboundary Strategic Framework for the Conservation of Prespa to implement joint projects and activities.

Lesson learnt from this case study include:

- The relevance of the official top-down designation of Ramsar sites in Prespa that stimulated the transboundary collaboration;
- The key role of NGOs (especially the Society for the Protection of Prespa), as a catalysing agent for collaborative governance;
- The importance of dialogue, trust and overall scientific understanding of basin-wide ecosystems;
- The importance of ensuring a long-term financing system for the conservation and sustainable management of Prespa lakes.

Source: Catsadorakis et al., 2021

5. Policy framework for EU wetlands governance

This section provides a general overview of main policies issued at the international level that can support wetland restoration in Europe. Due to the broad definition of wetlands that includes different types of inland, coastal and marine ecosystems (see section 2), the issue of wetland restoration appears quite fragmented in a high number of policies. Besides the Ramsar Convention which directly addresses the "wise use of wetlands", many other policies offer opportunities for wetland conservation and restoration by setting goals and targets for water quality, biodiversity, risk management and sustainable development.

The main policies at the global, European and macro-regional levels are described in the following sections, highlighting their possible role in enabling improved governance for wetlands restoration. Beyond this general overview, the concrete role that these policies had in supporting restoration of WaterLANDS KS is described in Section 5 of this document. Section 5 also includes some references to national policies that were considered relevant or are expected to be relevant in the next future, to support successful wetland restoration of KS.

5.1 Policies at Global level

Convention on Wetlands of International Importance especially as Waterfowl Habitat, Ramsar Convention, 2 February 1971

The **Convention on Wetlands of International Importance especially as Waterfowl Habitat, "Ramsar Convention, 2 February 1971"** is the only global convention that focuses specifically on wetland biodiversity and ecosystems.

"Wise use" is at the heart of the Ramsar Convention and applies to all wetlands. It is defined as "the maintenance of [a wetland's] ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development".

The Action Plan 2014-2026 stresses the need for cooperation, which is extremely relevant for governance issues. It promotes cooperation platforms at different spatial and ecosystem levels and mechanisms to bring together managers, private and public stakeholders. Partnerships and international cooperation are crucial, since the wise use of wetlands ultimately involves a range of actors well beyond those strictly responsible for the management of individual wetlands.

Contracting Parties should implement the Ramsar Strategic Plan at national and regional levels by developing national wetlands policies, strategies, action plans, projects and programmes or other appropriate ways to mobilise action and support for wetlands.

Opportunities from the Ramsar Convention

The Ramsar Convention requires a proper management of Ramsar sites through adequate planning systems.

Article 3.1 of the Convention specifies that "Contracting Parties shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List". **Management plans** for all Ramsar Sites are required, according to Resolution 5.7 and Resolution VIII.14. Finally, the effective conservation and management of the Ramsar Site Network is one of the three strategic goals of the Ramsar Convention Strategic Plan for 2016-2024. The Plan calls for efforts to enable the participation of stakeholders, including indigenous peoples and local communities.

→ Management plans for Ramsar sites help obtain financial resources, provide wider context for local decisions on management planning, link local actions with wider (national and international) wetland policies, enable communication within and between sites, organizations and stakeholders.

→ Ramsar guidelines for the management of designated sites encourage a planning process that includes multiple actors, defines common objectives, and establishes adequate financial resources.

→ For Transboundary Ramsar sites, the Ramsar convention encourages enhanced collaboration between authorities on both or all sides of the border.

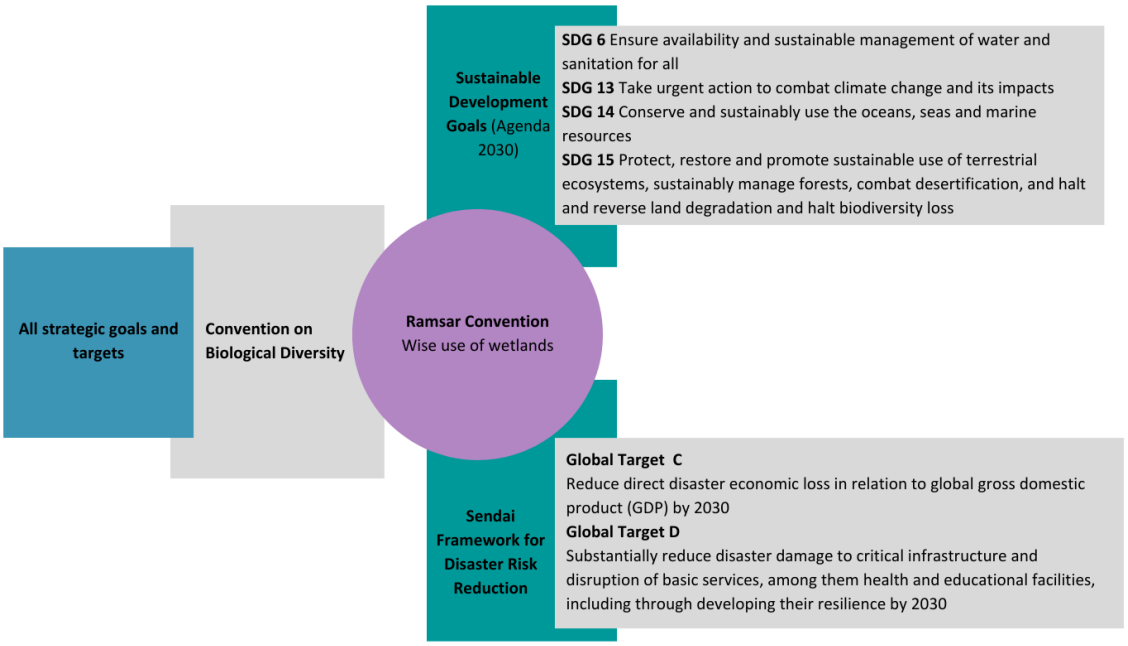


Figure 4.1 - The wise use of wetlands in the Ramsar Convention and its relation with the Sustainable Development Goals and the global targets of the Sendai Framework for Disaster Risk Reduction.

The Ramsar Convention acts as the lead partner for wetlands in implementing the **Convention on Biological Diversity, Rio de Janeiro, 1992 (CBD)**. The two conventions, though with different composition of Parties, share common objectives: the Ramsar Strategic Plan 2016-2024 targets were fully aligned or compatible with the CBD's Aichi Biodiversity Targets and CBD Strategic Plan for Biodiversity. Though all targets are relevant for wetlands, since they occur in all biomes, Target 14 places special emphasis on the governance of wetlands restoration, by requiring the restoration of all ecosystems that provide essential services, including services related to water, taking into account the needs of all social groups, including the most vulnerable. The two Conventions collaborate through a succession of Joint Work Plans. Their Fifth Joint work plan (2011-2020) invited the national focal points of the two conventions to cooperate in a proactive and flexible way to implement the work program.

Conservation and wise use of wetlands (main goal of the Ramsar Convention) can also contribute to fulfilment of two other global frameworks: the **United Nations Sustainable Development Goals** and the **Sendai Framework for Disaster Risk Reduction**. Indeed, wetlands can be regarded as green infrastructure able to offer protection against floods and other extreme events (Sebesvari et al. 2019).

Kunming-Montreal Global Biodiversity Framework, December 2022

The 15th Conference of Parties to the UN Convention on Biological Diversity adopted the "Kunming-Montreal Global Biodiversity Framework" (GBF), including four Goals and 23 Targets for achievement by 2030. Among the four overarching global goals for 2030, Goal B: "biodiversity is sustainably used and managed and nature's contributions to people, including ecosystem functions and services, are valued, maintained and enhanced, with those currently in decline being restored, supporting the achievement of sustainable development, for the benefit of present and future generations by 2050" is particularly relevant to wetland restoration.

The GBF emphasises the need to restore, maintain and enhance nature's contributions to people, including ecosystem functions and services through Target 2 and Target 11. Indeed, regulation of air, water, and climate, conservation of soil health and pollination and reduction of disease risk, as well as protection from natural hazards and disasters, through NBS and ecosystem-based approaches are highlighted.

Other relevant targets include Target 15 and 19, which focus on engaging businesses and mobilising financial resources to implement national biodiversity strategies and action plans. While Target 15 zooms in at legal, administrative or policy measures to encourage and enable businesses to support conservation, and in particular to ensure that large and transnational companies and financial institutions are held accountable, Target 19 focuses on substantially and progressively increasing the level of financial resources from domestic, international, public and private sources.

Opportunities from the Kunming-Montreal Global Biodiversity Framework

→ **Target 2** will have a catalyzing effect for wetland restoration, as it states that Contracting Parties shall "Ensure that by 2030 at least 30 percent of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity."

→**Target 11** will also boost restoration actions, with specific focus on disaster risk reduction and protection from natural hazards. Wetlands are effective NBS and are known to act as buffer zones to storm surge, absorbing the worst impacts and storing excess water.

→ **Target 15** will increase transparency on risks, dependencies and impacts on biodiversity for large and transnational companies and financial institutions along their operations, supply and value chains and portfolios. Wetlands will benefit from more sustainable consumption patterns and reduced pressures from extractive industries, which will be under increased scrutiny by policy-makers and regulators/legislators.

→ **Target 19** will increase total biodiversity related international financial resources from developed countries to at least $ 20 billion per year by 2025, to at least $ 30 billion per year by 2030. It will also leverage private finance, promoting blended finance, implementing strategies for raising new and additional resources, and encouraging the private sector to invest in biodiversity, including through impact funds and other instruments. Innovative schemes such as payment for ecosystem services, green bonds, etc. will provide new tools to support biodiversity conservation and restoration. The role of collective action and community-based approaches will also be strengthened, thus benefiting local communities in protecting their territories and ecosystems.

5.2 Policies at European level

While wetlands are not covered by a specific policy or legal instrument, they are included in the scope of various environmental measures (Water Framework Directive, Floods Directive, Natura 2000 Directive, Biodiversity Strategy and the Marine Strategy Directive) come together. Due to the cross-cutting nature of wetlands, different policy and legislative instruments overlap and complement each other in addressing different issues that are of overall relevance for wetlands.

The need for a general policy framework that explicitly addresses wetlands in Europe has been advocated by the Joint Research Centre (the European Commission's science and knowledge service) (Maes, 2020) to better integrate existing policies and ensure an ecosystem-based approach to decision making processes.

Moreover, EU policies give fundamental support to wetlands protection and restoration and to their governance, but they need to be fully translated into concrete and prioritised actions in the national and regional governmental agenda.

It is particularly relevant to mention the European Green Deal, approved in 2020, which is a set of policy initiatives by the EC with the overarching aim of making the European Union (EU) climate neutral in 2050. This legislative package is crucial to support wetland restoration and upscaling. A lot of hope rests on the EC's proposal for a Nature Restoration Law, the first continent-wide, comprehensive law of its kind. It is a key element of the EU Biodiversity Strategy, which calls for binding targets to restore degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters. In this proposal, particular attention is given to wetlands restoration.

The Water Framework Directive, the Floods Directive and the Marine Strategy Framework Directive

The Water Framework Directive (WFD)[5] applies to inland, transitional and coastal surface waters as well as groundwater. It establishes a framework for the assessment, management, protection and improvement of the status of surface and groundwater bodies within river basin districts, across the EU.

Although the WFD refers to wetlands (Recitals 8 and 23, Article 1(a) and Annex VI(vii)), it neither defines wetlands nor assigns protective measures/protections to them. The WFD does not explicitly deal with wetlands relative to rivers and lakes. However, wetlands clearly benefit from WFD obligations on national authorities to protect and restore the status of water. Wetlands can be dependent on groundwater bodies, form part of a surface water body, or be part of protected areas, that are all addressed by the WFD. To implement and achieve the objectives of the Directive, Member States (MS) shall establish a River Basin Management Plan (RBMP); these may include measures to mitigate pressures on wetlands that may affect the ecological and chemical status of water bodies related to hydrology. The creation of wetlands or their restoration can also be included in the RBMP (as listed in Annex VI of the Directive) to support the achievement of environmental objectives, for instance by abating pollution or favouring groundwater recharge (EC, 2012).

The **Floods Directive (FD)**[6] aims to establish a framework for the assessment and management of flood risks, aiming at the reduction of the adverse consequences for human health, the environment, cultural heritage and economic activity associated with floods in the Community (Art.1).

It states (Art. 9) the need to coordinate for the implementation of both directives as well as the goals with those of the WFD, based on the proposition that flood risk management can proceed together with nature protection and restoration, and deliver benefits for both people and nature. Moreover, MS shall coordinate the adoption and revision of FRMP and RBMP, and may integrate them to the

[5] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

[6] Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks

RBMP, and with the same revision frequency of WFD RBMPs, so as to maximise synergies between the implementation of the two Directives.

Article 7 of the Floods Directive specifies that FRMPs may also include the promotion of sustainable land use practices, improvement of water retention as well as the controlled flooding of certain areas in the case of a flood event. Indeed, there are many win-win solutions that support the achievement of both Directives. Restoration of impaired wetlands, reconnection of wetlands to water bodies or creation of new wetlands have a key role to play in this direction (ICPDR, 2020), as natural water retention measures can increase the retention capacity within catchments and enhance their natural functioning.

Besides the WFD and FD, the EU Marine Strategy Framework Directive (MSFD)[7] is also relevant to coastal wetlands. Adopted in 2008 to "protect more effectively the marine environment across Europe", it is the first EU legislative tool dealing with the protection of marine ecosystems and biodiversity. The Directive covers the whole extent of marine wetland habitats being defined by the Ramsar convention as "Marine waters less than six metres deep at low tide".

Opportunities from the EU WFD and FD

The WFD and FD redefine governance along hydrological boundaries by using a river basin district approach that transcends administrative boundaries.

The preparation of RBMPs and FRMPs at the district level requires the cooperation of different national, regional and local authorities. For river basins crossing national borders, the WFD requires MS to coordinate. In this regard, governance structures are being progressively formalised, and international RBMPs increasingly developed (EC, 2019).

→The preparation of RBMP and FRMPs within the WFD and FD offers excellent opportunities to harness the attention of multiple actors on cross-cutting themes, harmonise assessment approaches and establish a consistent and effective Plan of Measures with high relevance for wetlands within the basin.

→The implementation of WFD and FD can trigger the establishment of international agreements or international coordinating bodies to manage transnational river basins where wetlands are located or to manage river basins located at the country borders. Article 3 of the WFD states that "MS shall ensure that a river basin covering the territory of more than one MS is assigned to an international river basin district. At the request of the MS involved, the Commission shall act to facilitate the assigning to such international river basin districts."

→The implementation of the WFD (Art. 14) which requires participation of interested parties and FD (Art. 9 and 10) offer potential for participative approaches to water management, with positive interconnections also for wetlands.

[7] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)

Habitats and Birds Directive (Natura 2000 network)[8]

Natura 2000, the largest coordinated network of protected areas in the world, was established with the aim to ensure the long-term survival of Europe's most valuable and threatened species and habitats. The EU Birds Directive (BD) and the Habitats Directive (HD) establish the Natura 2000 network.

While Annex I of the HD lists habitats types that need protection/special areas of conservation, MS provide protection to several wetland habitats with its implementation, including certain types of peatlands (raised bogs, mires and fens), wet forests (swamps) and coastal wetlands (lagoons, estuaries). The same goes for Annex II that lists species that need protection/special areas of conservation for MS to protect. The BD lists the species that need protection/special areas of conservation and MS provide protection for birds by supporting special conservation measures. In defining special conservation areas, MS are required to pay particular attention to the protection of wetlands and particularly to wetlands of international importance as defined by the Ramsar Convention.

The network of Natura 2000 covers about 41% of wetlands[9,] while the remaining 59% is outside the network of the EU wetlands area. Around 90% of coastal lagoons and salt marshes (coastal wetlands) are thus protected. However, other wetlands such as lakes and ponds, open mires, riparian, fluvial and swamp coniferous forest are located outside the network. Moreover, traditional wetland habitats of cultural interest, such as rice fields, are totally lacking representativeness, as they are not listed as (semi-natural) habitats of community interest (Maes, 2020).

Opportunities from the Birds and Habitats Directives

The Habitat Directive defines (Art.6) how MS shall manage and protect Natura 2000 sites, with important opportunities for the governance of natural sites, including wetlands. MS must (i) take appropriate conservation measures, to maintain and restore the habitats and species for which the site has been designated to a favourable conservation status; and (ii) avoid damaging activities that could significantly disturb these species or deteriorate the habitats of the protected species or habitat types.

Conservation measures can be defined in appropriate site-specific management plans or integrated in other existing development plans. They can also be framed in appropriate statutory, administrative or contractual measures.

→The implementation of the Article 6 of the Directive offers the opportunity to gather governance actors together to develop a new vision for wetlands, establish a new plan for restoration and

[8] Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds" and "Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

[9] According to the “extended wetland layer”, based on a wide definition of wetlands that include Inland wetlands, coastal wetlands and other hydrologically connected ecosystems (Maes, 2020)

coordinate the integration of different existing plans at a wider spatial scale. It also offers the opportunity to legitimise restoration actions, setting common procedures and rules (formal agreements, memorandum of understandings) between different institutions involved in restoration.

→The implementation of the Habitat Directive can favour securing EU funding for restoration of endangered wetlands, whenever the site is designated as a Special Area of Conservation.

→ Together with the Rural Development Fund, LIFE is the EU's main source of funding for implementing the Habitats and Birds Directives and has concretely helped to establish management plans and perform restoration works for several Natura 2000 sites.

EU Biodiversity Strategy

The EU Biodiversity Strategy and its associated Action Plan, a core component of the EU Green Deal, establishes an ambitious framework to protect nature and reverse the degradation of ecosystems. Wetlands are fully recognised in the EU Biodiversity Strategy as ecosystems able to provide ecosystem service benefits by mitigating flood damage losses, reducing carbon emission and ensuring adaptation to climate change.

Opportunities for wetlands can arise from the achievement of the ambitious targets set by the Biodiversity Strategy by 2030 including:

- Restore at least 25,000 km of rivers into free-flowing rivers through the removal of primarily obsolete barriers and the restoration of floodplains and wetlands.
- Restore significant areas of degraded and carbon-rich ecosystems;
- Legally protect a minimum of 30% of the EU's land area and 30% of the EU's sea area and integrate ecological corridors, as part of a true Trans-European Nature Network.
- Effectively manage all protected areas, defining clear conservation objectives and measures, and monitoring them appropriately.

As recognised by the Biodiversity Strategy, EU targets risk being elusive concepts if they are not translated into legally binding requirements for MS. A concrete opportunity for the restoration of wetlands therefore arises from the proposed Nature Restoration Law (2022/0195 (COD) due to its aim of providing an effective framework to ensure implementation. The 2022 legislative proposal presented by the EC proposes legally binding targets to restore 20% of degraded EU ecosystems, aligned to the targets set by the Biodiversity Strategy.

Opportunities from the EU Biodiversity Strategy and the Proposed Nature Restoration Law

The 2022 EC's proposal for a Nature Restoration Law (conceived as a Regulation, and thus directly binding for MS once entered into force) requires MS to prepare "national restoration plans", maximising synergies with climate change mitigation and adaptation.

→If the approach of the 2022 EC's proposal is adopted, it will subject MS to binding targets for restoration of their ecosystems. This will have the potential to directly boost wetland restoration and reinforce coherence of local restoration projects in a national framework, with a periodical revision process.

→Authorities at national, regional and local levels would play a major role in mapping and assessing ecosystems and their services, and in planning, funding, implementing and monitoring restoration programmes.

On carbon emissions reductions, in November 2022, the European Commission adopted a proposal for a first EU-wide voluntary framework to reliably certify high-quality carbon removals. The proposal is expected to boost innovative carbon removal technologies and sustainable carbon farming solutions, and contribute to the EU's climate, environmental and zero pollution goals. The proposed regulation will significantly improve the EU's capacity to quantify, monitor and verify carbon removals. Higher transparency will ensure trust from stakeholders and industry and prevent greenwashing. The European Climate Law, signed in 2021, makes it legally binding for the EU to achieve a balance between greenhouse gas emissions and removals by 2050, and to achieve negative emissions thereafter. It also includes an ambitious 2030 climate target of at least 55% reduction of net emissions of greenhouse gases as compared to 1990. The proposal for carbon removal certification is therefore crucial to achieve the EU's long-term climate objectives under the Paris Agreement and make the European Green Deal a reality. This proposal could strengthen the role of wetlands as NBS for carbon emissions reduction (EC, 2022).

5.3 Policies at Macroregional level

Ramsar Regional Initiatives (RRIs) are centres or networks for regional cooperation and capacity-building on wetland-related issues in specific regions. Regional initiatives relevant for Europe are the Nordic-Baltic Wetland Initiative, the Mediterranean Wetland Initiative, the Carpathian Wetland Initiative, and the Black Sea Coastal Wetlands Initiative.

Some of these initiatives work within the framework of international Conventions, like the Barcelona Convention, the Danube River Protection Convention and the Carpathian Convention, described in the following sections.

Mediterranean Sea – The Barcelona Convention

The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention, as amended in 1995 and entered into force in 2004) aims to prevent, abate and combat pollution, to protect and enhance the marine environment and to contribute to the sustainable development of the Mediterranean area. Its Protocol on Integrated Coastal Zone Management (ICZM Protocol, adopted in 2008) is a unique instrument that provides the

legal framework for this approach. This important step in the Mediterranean policy framework emerged after six years of efforts by the Mediterranean Action Plan. The Protocol responded to the urgent need for action in Mediterranean coastal zones which, despite their valuable natural and cultural heritage, is being increasingly impacted by anthropic pressures and degradation.

Wetlands are recognised as "specific coastal ecosystems" under Article 10 of the ICZM Protocol: signatories must "undertake, to the extent possible, the restoration of degraded coastal wetlands with a view to reactivating their positive role in coastal environmental processes".

According to Article 6 of the ICZM Protocol, "appropriate governance" is one of the key ICZM principles and requirements, allowing "adequate and timely participation in a transparent decision-making process" ICZM is based on the 'ecosystem approach' as an interdisciplinary and integrated governance approach that recognises the richness and complexity of ecological systems. It bases decision-making on the ecological limits and spatial boundaries of ecosystems and integrates social, ecological and governance principles to preserve healthy and productive ecosystems and related services.

Opportunities from the ICZM Protocol

Coastal wetlands are recognised as specific coastal ecosystems in the ICZM Protocol, which identifies the principles for integrated coastal management and planning. The protocol encourages the following governance measures:

→participation in a transparent decision-making process by local populations and stakeholders. Participation is recognised as a key element of appropriate governance of coastal systems.

→institutional coordination among different sectors and different governance levels

→formulation of comprehensive coastal strategies, plans and programmes

Under the Ramsar Convention, the Mediterranean Wetlands Initiative (MedWet) encourages and supports wetland managers and governments to adopt policies and take action on the ground to drive the conservation and sustainable use of Mediterranean wetlands. It includes the 27 Mediterranean Contracting Parties to the Ramsar Convention, as well as Palestine, the Ramsar Secretariat, intergovernmental institutions, NGOs, and specialist national wetland organisations.

Convention on cooperation for the protection and sustainable use of the Danube river, "the Danube River Protection Convention", Sofia 1994

The Danube River Protection Convention (DRPC) forms the overall legal instrument for cooperation on transboundary water management in the Danube River Basin. Its main objective is to ensure that surface waters and groundwater within the Danube River basin are managed and used sustainably and equitably. The signatories of the Convention have agreed to co-operate on fundamental water management issues. The coordination and implementation of the DRPC is entrusted to the

International Commission for the Protection of the Danube River (ICPDR). The ICPDR's basin-wide vision is that floodplains/wetlands all over the Danube River area are re-connected and restored. Indeed, disconnection of adjacent water bodies was considered as one of the main hydrological alterations of the Danube River basin.

Opportunities from the Danube River Protection Convention

Within ICPDR, the Expert Group on River Basin Management and the Expert Group on Flood Protection develop tasks related to the implementation of the EU Water Framework Directive and Floods Directive. Expert groups work in the same direction, recognising that coordinated planning under the WFD and FD has the potential to identify win-win solutions that can deliver on the objectives of both policies (ICPDR, 2020).

Opportunities for restoration of wetlands in the Danube area can derive from:

→cooperation between all EU and non-EU countries that belong to the Danube river basin, bringing together all interests upstream and downstream.

→coordination of the public participation procedures in the preparation of river basin and flood risk plans

→coordination of efforts to manage flood risk in a sustainable way.

The Carpathian Convention

The Carpathian Convention is a subregional treaty to promote the sustainable development and protection of the Carpathian region. It was signed in May 2003 by seven Carpathian States. The Parties to the Convention are called upon to cooperate in the protection and sustainable development of the area in order to improve quality of life, strengthen local economies and communities, and conserve natural values and cultural heritage. The Convention encourages, *inter alia*, public participation and stakeholder involvement, transboundary cooperation, and the ecosystem based approach.

Wetlands are not explicitly mentioned in the Convention text. However, Article 6 of the Convention addresses the topic of "sustainable and integrated water/river basin management". In the Carpathians, waters flow to the Black and Baltic Seas via four large river catchments of the Danube, Dniester, Vistula and Oder rivers. In this respect, the regional Carpathian Wetland initiative (CWI) was founded to strengthen the collaboration with the Ramsar Convention. CWI aims to contribute to the implementation of the Memorandum of Cooperation between the Convention on Wetlands (Ramsar Convention) and the UNEP Interim Secretariat of the Carpathian Convention (UNEP Vienna ISCC), signed on 13 December 2006 in Kyiv, Ukraine. According to this memorandum, the Secretariat of the Convention on Wetlands and Carpathian Convention will develop a collaborative programme for sustainable wetland and water resource conservation and management. CWI seeks to ensure and support the effective conservation and wise use of wetlands in the Carpathians and beyond.

Opportunities from the Carpathian Convention and CWI

CWI is expected to facilitate collaboration between the Carpathian Convention, the Ramsar Convention and its Parties in their efforts in conservation and wise use of wetlands in the Carpathian region and beyond, through local, national, regional and international activities.

Several opportunities for wetland governance arise from the collaboration of the two conventions. In particular, CWI has the potential to:

→facilitate effective cooperation between different sectors (environmental protection and water management in particular);

→ identify and develop specific wetland restoration projects in major Carpathian river catchments;

→ emphasise the importance and value of transboundary wetland ecosystems and develop common objectives and principles for their management and wise use, based on the experiences of successful case studies;

→ coordinate with other international initiatives, projects and networks both in the region and globally.

Coordination and cooperation between institutions and regional and local authorities so as to encourage shared responsibility is also a requirement of the Protocol on Conservation and Sustainable Use of Biological and Landscape Diversity, issued under the framework of the Carpathian Convention.

The following section looks at the governance systems in the KS and offers an analysis of the results while identifying governance models that emerged from the KS lessons. It also discusses the Success and Limiting factors based on the results of a previous survey. Finally, it looks at how international and national policies are implemented at KS, which influence they exert on wetlands restoration and how governance systems are organised to achieve the objectives set.

6. Governance systems in the WaterLANDS Knowledge Sites

6.1 Methodological approach

The selected approach to analyse governance systems in the WaterLANDS KS (Table 5) included two steps:

1. ***A deep analysis of governance for a first selection of KS***

   This selection was based on a preliminary analysis of governance conditions previously performed within this project deliverable. Several selection criteria were considered, to include different types of wetlands, different geographical areas, different governance systems, size and diversity of stakeholders involved. The collection of KS includes six sites (one of them split in two subsites), encompassing both inland wetlands and coastal wetlands and representing three different biogeographical regions (Continental, Mediterranean, Atlantic) and 6 different countries.

Information for each KS was derived from the analysis of scientific literature, technical reports, and websites. It was then complemented by interviews or written interactions with the local contacts. A dedicated factsheet for each KS was prepared. It includes a detailed description of challenges related to restoration activities, implemented measures, main actors and roles, strategies and plans, success and limiting factors favouring or hindering replication. The factsheets are reported in Annex I of this report, while general conclusions are reported in section 7.2.

2. *General overview of the additional Knowledge Sites of the WaterLANDS project*

This activity involved the preparation of a common questionnaire shared with the KS' contacts that was specifically designed to obtain fundamental information useful for the development of a theoretical governance framework. Results from the previous step were used to design the questionnaire. In the first section, recipients were asked to freely report about the governance scheme in place in their wetland. Then they were asked to respond to specific questions (closed-ended questions) about: the governance model, the support from global, European and national policies, and the funding availability. Finally, recipients were asked to assess success and limiting factors of governance coming from the cross analysis of the first group of KS. This assessment was conducted using a semi quantitative score system (0- no relevance/low relevance; 1- medium relevance, 2- high relevance). The main conclusions derived from the questionnaire results are reported in Section 6.2. Additional KS include seven sites, mainly embracing inland wetlands (forests and peatland habitats).

It is important to note that the Finnish site, Siikaneva has not been included in this study because this KS has not been restored and does not provide any governance lessons. It is a pristine wetland site used as a reference as part of the European Carbon Monitoring Network (Integrated Carbon Observation System - ICOS).

	Name of the site	**Country**
First selection of Knowledge Sites (deep analysis, factsheets in Annex 1)	Abbeyleix Bog	Ireland
	Doñana wetlands	Spain
	Camargue	France
	Venice Lagoon	Italy
	Belene Island	Bulgaria

	Wetlands around Warsaw (Calowanie Fen and Kampinos)	Poland
Additional KS (General overview)	Jämtand Mountain	Sweden
	Store Mosse	Sweden
	Karrendorf Meadows (Greifswald)	Germany
	iCASP Yorkshire	England
	Tudu-Sirtsi	Estonia
	Engbertsdijksvenen	The Netherlands
	Mazury Forest	Poland

Table 5. KS of the WaterLANDS project included in the analysis of governance conditions

6.2 Results

The KS analysis revealed the presence of heterogeneous models of governance, mainly due to different geographical features of the sites (e.g. areal extent), different land ownerships (private land, state land) and different history of sites (change in land use and related anthropogenic pressures, past successful or detrimental experiences of management).

Restoration emerged due to different factors. Drastic land-use change (from commercial exploitation to ecological restoration and conservation) has been quite relevant for various KS and marked a decisive change in their governance. For example, in the Camargue, the acquisition of the site by the Conservatoire du Littoral and the termination of salt production, determined the implementation of a restoration programme. Similarly, at Abbeyleix Bog, a community-led limited company (Abbeyleix Bog Project Ltd) led the restoration programme after negotiating a 50 year lease with the semi-state company Bord Na Mona[10] that had used the site for fossil peat extraction. Conversely, the private (and

[10]Bord Na Mona is a semi-state agency which was sanctioned to mine peatlands at industrial scale post-WW2 to enable Ireland to be more independent from British-imported coal which dried up during the war and also to create employment in the Irish midlands. Now Bord na Mona is involved in the restoration of peatlands, as partner to the National Parks and Wildlife Services (NPWS) in their projects. They stopped peat mining in 2019, nine years earlier than their initial deadline of 2028. They were also big employers in the region which leaves hope for an opportunity to redirect the workforce towards restoring peatlands and keep employment at the same level.

fragmented) ownership of wetlands, and limited possibilities of gathering funds for land purchase by NGOs, was highlighted as a barrier for restoration (Calowanie wetlands).

The main human threats that affected wetlands within the KS were related to the poor recognition of their ecological value in the past, with the most severe impacts occurring in the last century. The degradation of wetlands was exacerbated by general low awareness of their ecological functions. The construction of dykes (creating an artificial separation from hydrologically interconnected bodies) and drains were common practices used to favour peat extraction (Abbeyleix Bog) or the agricultural use of land (Belene, Calowanie). A progressive drying of wetlands, with a steep drop in groundwater levels was a common observed consequence of human activities in wetlands.

A major challenge associated with socio-ecological governance is rooted in the disconnection between those who culturally value ecosystems and those who have authority in an environmental governance domain (Hirons et al., 2016). Community-based experiences, such as those described in the Abbeyleix Bog, can help to close this gap. Community-based governance actors can be potent allies in changing entrenched governance and decision-making systems.

Climate change is another issue that is common to different KS and which is becoming increasingly relevant. In Camargue, the ecological restoration programme (hydrological reconnection of water bodies previously artificially separated to maximise salt production) has strengthened the ecosystem functioning to improve the resilience of the system to climate change. The use of an adaptive management approach and the implementation of nature-based solutions, such as the abandonment of the coastal dyke, allowing the reconnection of the sea to the lagoons, were essential to achieve the multiple objectives of the project. For the Venice Lagoon, the need to protect the city and other minor islands from the increasing risk of flooding due to sea level rise struggles to balance the need to preserve the functioning of the lagoon's ecosystem and to pursue the environmental objectives set by European Directives.

6.2.1 Governance models in KS

Governance systems analysed in different KS are very heterogeneous, having highly specific features that fit each context. However, to trace the variability of observed systems to a limited number of categories, the deep analysis made for the first group of 6 KS led to four main categories of governance models. The identification of such models was also supported by literature references (e.g. Carlisle et al., 2019; Termeer et al., 2010).

These categories of governance systems should, however, be regarded as broad theoretical models. The actual governance structures observed in the KS differ from these models or may be a combination of more than one model. Indeed, polycentric and monocentric systems are located at two ends of a spectrum of systems. They almost always coexist and are often intertwined in complicated ways (Morrison et al., 2019). Similarly, community-based models and networking models should not be considered completely alternative to polycentric or monocentric but can emerge within existing governance contexts. For this reason, the assignment of the most appropriate model to each KS may be imprecise.

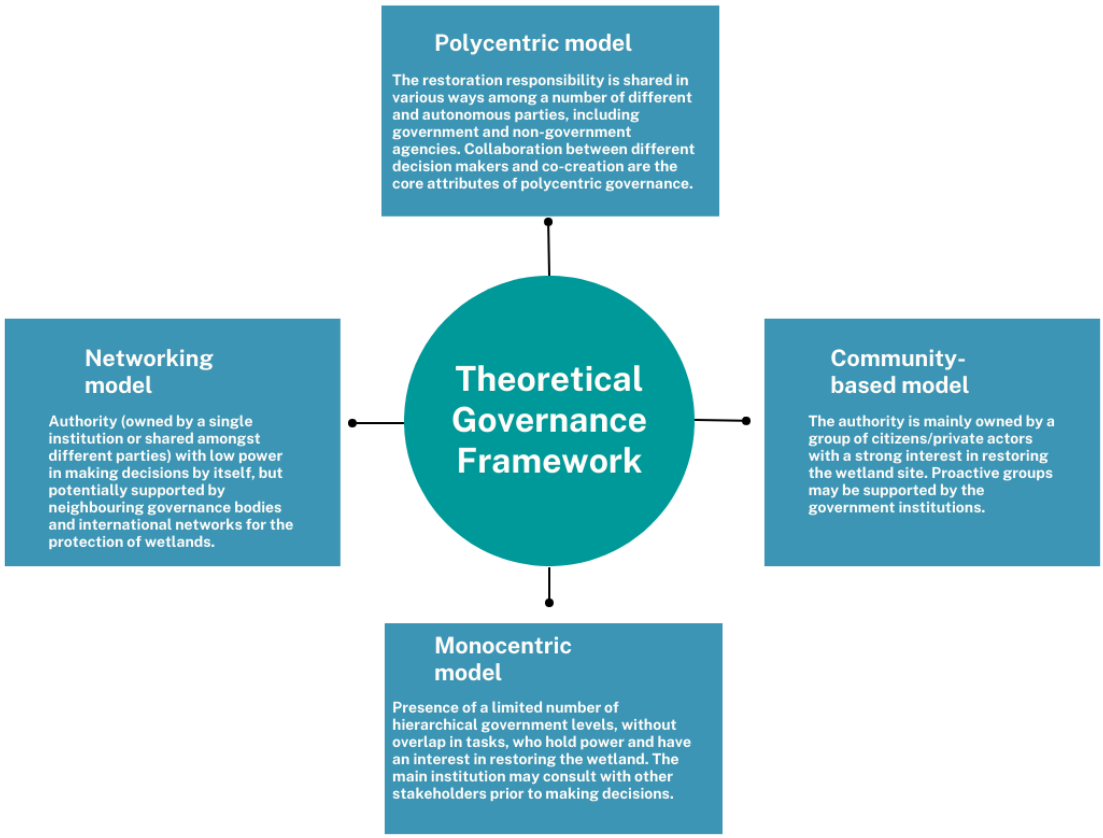


Figure 6.2: Four governance models in KS

The deep analysis of the first group of KS, as well as the general overview of the additional KS (questionnaire results), reveal that most systems can be broadly categorised as polycentric models, since wetlands are managed by many independent government and non-government actors that together influence the decision-making process.

Indeed, new governance systems have been developed largely as a critique of monocentric governance, moving away from governance dominated by hierarchical power, towards governance characterised by shared responsibility of public and private actors that received increasing scientific interest (Zeijl-Rozema et al., 2008, Termeer et al., 2010, Morrison et al., 2019). This interest arose from Elinor Ostrom's important theoretical work which demonstrated the effectiveness of polycentric governance systems. Indeed, Ostrom showed that small, local communities were able to manage shared natural resources such as fishing, water or forests, and that, over time, rules for managing the common were established to maintain the resources' long-term sustainability (Ostrom, 1990). According to her, no governance system is perfect, but polycentric systems have considerable advantages given their mechanisms for mutual monitoring, learning, and adaptation of better strategies over time (Ostrom, 2010).

Governance models for the first selection of Knowledge Sites

A clear example of polycentrism is that of Camargue, where the restoration process was set up in place by the Regional Natural Park (coordinating manager, public authority) working in partnership with the

Tour du Valat[11] and the National Society for Nature Protection[12] (co-managers) under the aegis of the Conservatoire du Littoral[13] (landowner). A multi-stakeholder committee involving all categories of local stakeholders was established. Similarly, the Doñana knowledge site can be seen as polycentric governance system, being mainly managed by the Andalusian Regional Authority in close collaboration with the Doñana Natural Space Participation Council which brings together administrations of different governance levels, different organisations and social and economic agents, and the scientific community.

In Venice Lagoon, the presence of several multi-level governance decision centres (national, regional and local levels) with different responsibilities suggests that the system exhibits a certain degree of polycentrism. Indeed, the power is shared among many actors with partly overlapping responsibilities. However, the system suffers from an uneven distribution of power among key actors (originating from the fact that most of funding is managed at national level and a unique concessionaire of the national government was identified to execute public works, see Annex document for further details) and, above all, cooperation is extremely limited. For this reason, the governance system has been defined as hierarchical and monocentric with limited possibilities for stakeholder participation (Munaretto et al., 2012).

The restoration of Abbeyleix Bog is an example of a community-based model, since the decision-making process is led by the Abbeyleix Bog Project, a community-led limited company not for profit, founded from a previously established association of residents, with strong interest in the conservation and restoration of the local bog. A Technical Advisory Group brings together the landowners, representatives of national and county institutions, an independent conservation organisation and community-appointed representatives.

Finally, the experience of restoration of Belene Island, in the Bulgarian Nature Park of Persina, can represent a networking model. In this case, the international dimension of restoration is a key distinctive feature of this wetland. Indeed, this area located by the Romanian border is part of the Danube River basin that in its lower stretch crosses areas from Bulgaria, Romania, Moldova and Ukraine. An overarching vision for the entire lower Danube River stretch was set up before the restoration started, through the international agreement for the lower Danube Green Corridor. This agreement sets up ambitious objectives for the whole area that the GEF (Global Environmental Fund) contributed to achieve locally in the Belene Wetland. The involvement of international experts from the World Bank was also decisive since they brought their knowledge and contributed to an effective design of restoration measures. Conversely, the current international unstable political situation can become a threat, relegating environmental issues to the lowest priorities of governments.

[11] Research Institute for the conservation of Mediterranean wetlands, a private institution with the legal status of a non-profit foundation that works in the public interest.

[12] Authority responsible for the Camargue Natural Reserve.

[13] French national coastal protection agency.

Governance models for the additional KS

The analysis of responses coming from the questionnaire revealed that governance systems of this group of KS are better represented by polycentric models (four sites), while monocentric systems are represented by the three other sites. Neither community-based models nor networking models were expressed by the questionnaire's recipients.

The main reason why KS were considered as polycentric systems is related to the presence of multiple parties (government and non-government) involved in restoration of wetlands. In the North of England (iCASP Yorkshire KS), the vast majority of peat restoration is carried out by the six peatland partnerships plus individual land owners. Partnerships are umbrella organisations funded by various agencies and authorities and bringing together different associations. iCASP, the Yorkshire Integrated Catchment Solutions Programme funded by the UK Natural Environment Research Council, is developing a shared understanding of environmental issues between partners, using scientific research as a cornerstone for integration (Richardson et al., 2021).

However, in other governance systems actually defined as polycentric by KS' contacts, collaboration between decision centres, a core element of polycentrism, is actually considered very limited or even absent. For example, at the Swedish sites Jämtland mountains and Store Mosse, governance suffers from lack of cross-sectoral dialogue and from inefficiencies due to the overlapping of roles of multiple actors. The same applies to the Estonian KS Tudu Sirtsi.

Conversely, the Engbertsdijksvenen site (The Netherlands), defined as monocentric in the questionnaire, actually displays some elements of polycentrism, since responsibility is shared between multiple levels of governance (national, regional and local). Finally, governance of the Mazury Forest KS (Poland) is dominated by hierarchical relations between different actors. However, restoration projects have initially been inspired and proposed by an expert group of foresters.

The main conclusion is that all KS have certain degrees of polycentrism. However, some features (lack of coordination and dialogue, limited participation) prevent them from being fully defined as polycentric models and instead look more like monocentric ones.

6.2.2 Success and limiting factors

First selection of KS

This mix of experiences collected from the analyses of the first group of KS has revealed the presence of some recurrent key positive elements of governance (success factors) that actually led to successful restoration activities. Conversely, some other elements of governance acted as barriers for successful restoration activities. A first attempt to identify the most relevant positive and negative elements of governance experienced in the seven KS is proposed in the following table.

Success factors	Abbeyleix Bog	Doñana	Camargue	Venice Lagoon	Belene Island	Kampinos	Calowanie
The presence of a multi-stakeholder committee, represented by both decision makers and other interested parties	X	X	X		X		
The proactivity of associations of citizens, truly interested in ecological restoration and worried about ongoing degradation caused by human activities	X						X

The presence of authorities that promoted/carried out the land acquisition from private owners, a pre-requirement to perform restoration			X				X
Political and funding support from the government, recognising the ecological value of the wetlands	X			X			
The recognition of Nature-based solutions and adaptive management as successful approaches for restoration			X				
The involvement of research institutes, with highly qualified team of people, able to provide the scientific basis for successful restoration		X					

The recognition of intangible values, cultural and aesthetic values, though not easily measurable	X						
The establishment of visitors centres, hiking and bike tracks, favouring recreation and sustainable forms of tourism	X				X		
Early involvement of citizens in the restoration plans	X					X	
The involvement of main governance actors in European funded projects (especially LIFE programme)		X	X	X		X	X
Limiting factors	**Abbeyleix Bog**	**Doñana**	**Camargue**	**Venice Lagoon**	**Belene Island**	**Kampinos**	**Calowanie**

Lack of an overarching strategy and long-term vision, able to ensure continuity and coherence of actions over time and to balance different needs and goals	X	X		X			
Lack of a comprehensive approach able to manage the site with a wide spatial scale in mind, that can go beyond the sites boundaries							X
Lack of dialogue with national agencies managing different sectors (agriculture, forestry) that could bring synergies and trigger new restoration opportunities							X

International political instability changing priorities in granting funds					X		
The presence of several administrative bodies governing multiple aspects, with partial overlap of roles				X			
The conflictual co-existence of multiple actors and interests, with multiple uses		X	X	X			
The presence of scattered land ownership with different tenure rights and with limited interest in achieving restoration goals		X					X
Change in governance and political vision over times		X		X			

Scepticism of citizens and stakeholders, due to lack of real understanding of the restoration rationale		X	X		X		X
Late/poor involvement of stakeholders in the decision making process		X		X			
Lack of adequate funding					X	X	X

Table 5.1. Success and limiting factors related to governance favouring or hindering successful ecological restoration

Among **success factors**, the presence of a multi-stakeholder committee, represented by both decision makers and other interested parties, is one of the main recurrent elements for KS, revealing a strong need for concerted actions able to take into consideration multiple perspectives and needs. In this regard, an inspiring example is the Participation Council for the Doñana wetland that was recognised at the international level, a joint 2020 UNESCO/IUCN/Ramsar Unesco mission to investigate the current threats due to the overexploitation of aquifers. However, the situation is serious in Doñana. Despite the repeated requests by UNESCO to stop illegal groundwater extraction (the cataloguing of over 1,000 illegal boreholes by the WWF) little has been done to address the problem. The effect of aquifer exploitation is most obvious in the disappearing dune ponds, which directly depend on the water table and hold endemic plankton species and rich communities of amphibians and dragonflies. However, when the aquifer recharges it also overflows into the marsh system that supports the waterbirds including Greater Flamingos, and this flow has been greatly reduced by the boreholes. Furthermore, on 9 February 2022 the Andalusian regional parliament voted to support a plan to legalize 1,500 ha of irrigated land and thus legitimize the operations of illegal farmers — despite open opposition from the Spanish central government, EU, UNESCO and several nongovernmental organisations.

The participation of governance actors in European funded initiatives (mainly LIFE projects) was also decisive to boost the participative approaches, communication and awareness raising which is strongly recommended by European policies. Positive experiences in this regard are offered by the two Polish case studies and the Venice Lagoon. Conversely, unless the European policy frameworks are prioritised and implemented with clear and achievable statutory objectives on a national and regional level, they are not expected to provide concrete support for wetland restoration.

Among governance **barriers**, the lack of an overarching strategy and long-term vision is a widespread issue. An overarching strategy should be able to ensure continuity and coherence of actions over time and to balance different needs and goals. This was particularly mentioned in the Doñana wetland site, where five successive restoration programmes were implemented from 1981 to the present, but an overarching strategy is also considered to be extremely relevant for the long-term restoration of the Abbeyleix Bog and for forward-looking governance of the Venice lagoon.

The conflictual co-existence of multiple actors and interests, with multiple uses, is another very common issue, sometimes related to a fragmented land ownership. The establishment of a multi-stakeholder committee, as previously mentioned, is one possible solution to overcome this barrier.

Restoration efforts commonly encounter scepticism among local people. For example, the removal of the dykes both in Camargue (sea front dyke) and in the Belene Island (gates are now regulating the water exchange with the Danube River) to allow a more natural water inflow and outflow, generated some concerns, especially among people who were long accustomed to an alternative regime of water management. In Doñana, stakeholders complained that they were involved, or rather co-opted, too late in the process, only to boost the legitimacy of the measures that were already designed. On the other hand, other experiences show that early involvement of citizens in the planned restoration

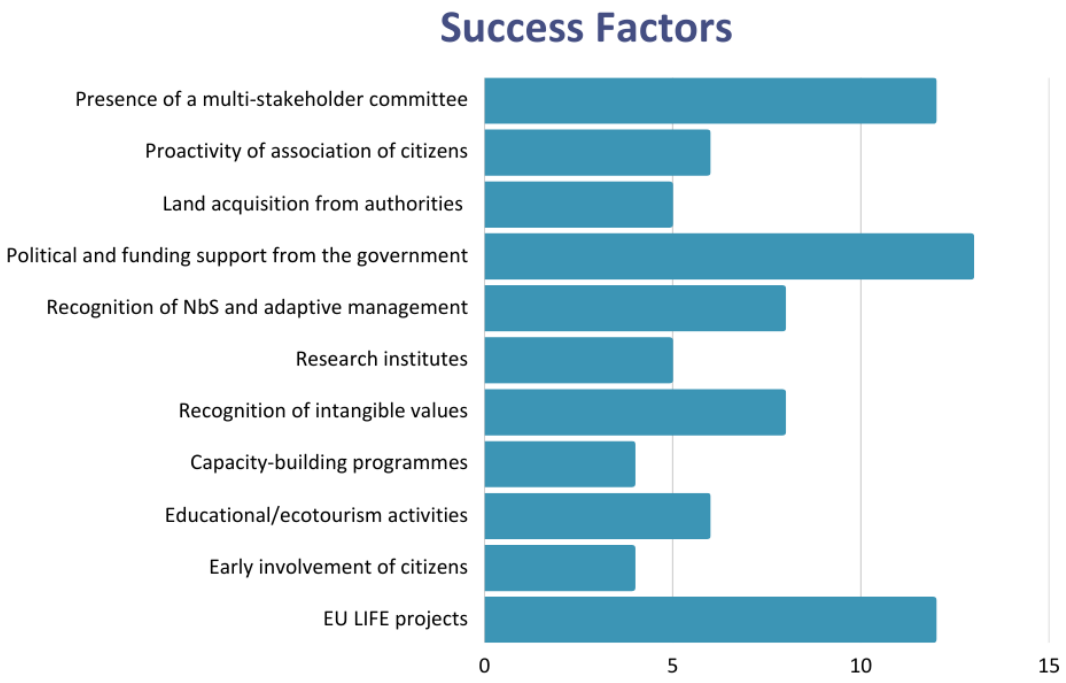
activities is extremely important. For example, Kampinos achieved a more supportive and collaborative environment by dissemination activities as part of a LIFE project.

Additional Knowledge Sites

The success and limiting factors initially derived from the analysis described above, were assessed by the additional KS contacts. Questionnaire recipients were asked to assign a score (0; 1; 2) to the factors, in order to assess their relevance for each KS. For each factor, the total score was then computed, as the sum of single scores assigned by the local contacts of the KS.

Results indicate that the three most important governance success factors that favoured ecological restoration were the political and funding support from the government (total score =13), the presence of a multi-stakeholder committee that brings together different actors (total score =12) and the participation in LIFE-funded projects (total score = 12). In particular, the political and economic support from the government was assessed as highly relevant (score 2) from 6 KS and averagely relevant from one KS (Mazury Forest).

Among limiting factors, the presence of conflicting actors and land uses, as well as the presence of multiple (overlapping) governance actors with inefficiencies in their coordination, are two of the most relevant factors (scores of 12 and 11 respectively) that acted as barriers to restoration. Similarly, the lack of dialogue among agencies of different sectors is highly relevant (total score =10). These results appear in contradiction with the definition of effective polycentric models of governance that relies on redundancy of decision centres (but with clear definition of respective competences), dialogue, collaboration and co-creation. This suggests that most KS, although theoretically defined as polycentric due to the presence of multiple governmental and non-governmental actors involved in decision making, actually lack the essential elements of polycentrism.



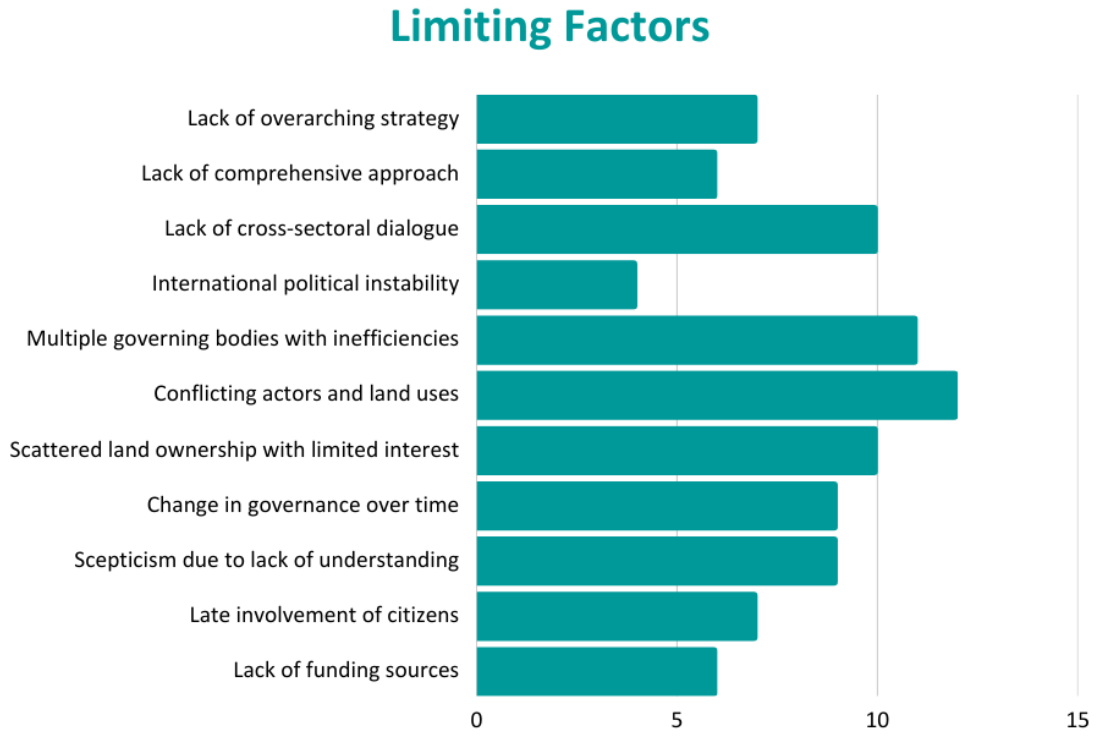


Figure 5.1. Success and limiting factors for ecological restoration: results from the additional 7 KS. Total scores were computed as the sum of individual scores (0= no relevance/low relevance; 1 =medium relevance; 2 = high relevance).

Discussion

Results from both KS groups are fairly consistent with each other. Success factors identified in both KS groups converge on the main points such as the presence of a multi-stakeholder committee, access to EU LIFE funding for wetland restoration and having a strong political and funding support from the government. For both KS groups, it is clear that there are common issues such as land ownership fragmentation with conflictual co-existence of multiple actors and interests and multiple uses, but also the lack of an overarching strategy and long-term vision. The lack of dialogue between agencies in different sectors contributes to a lack of confidence in the ability of institutions to build consensus on environmental issues. Although all KS face different problems, rooted in their local context, we find that common patterns emerge, linked to the fact that most KS are located in EU or former EU countries and that EU policies have greatly influenced their national environmental legislation.

6.2.3 Role of international and national policies

Possible opportunities for wetlands restoration coming from international policies are described in Section 3, which provides a general overview of global, European and macroregional policies. This section aims to explore what and how international policies and national policies have concretely supported (or are expected to support) KS restoration.

International policies

As previously mentioned (success and limiting factors, Section 6.2.2), restoration activities of some KS benefitted from participation in projects funded by the LIFE programme, the EU's main source of funding for implementing the Habitats and Birds Directives. The Directives set the list of species and habitats to protect while MS are responsible for the implementation and protection of wetlands. LIFE fundings have allowed projects to restore wetlands and to develop management plans of natural and protected areas.

The Water Framework Directive can also be considered supportive for restoration of KS. Indeed, it requires the preparation of RBMP that set up measures to improve the ecological conditions of surface water bodies (see section 4.2). This enabling factor was specifically recognised as a key potential factor for further restoration in the two Polish wetland sites. Indeed, the RBMP set up specific quality objectives for the Całowanie Fen, (e.g. increasing the moisture content of the Całowanie Fen, not allowing the construction of new fishponds and peat extraction, drainage of wet meadows and marshes). Similarly, within the public consultation of the second revision of RBMP in Poland, the Kampinos National Park made concrete proposals for the implementation of restoration measures, which were then included in the official programme of measures of RBMP and are expected to formally facilitate the implementation of restoration in the framework of the WFD. Positive feedback also came from the Venice Lagoon, where the need to implement EU policies (FD and WFD) has been providing a framework able to bring together all actors to promote participative processes. However, some delays in the national implementation of EU Directives, with special reference to the WFD (e.g.

KS from Bulgaria and Poland) have prevented the full exploitation of such instruments so far, but are expected to have a major and increasing role in the future.

Moreover, the presence of complex and poorly applicable procedures and metrics for the classification of the ecological state of water bodies according to the WFD, has in fact weakened certain processes, as shown by the analysis of the Doñana KS. In particular, the categorisation of the Guadalquivir River amongst the "highly modified" water bodies has led to the consequent lowering of its quality objectives, preventing the implementation of possible specific restoration measures. As a matter of fact, the Guadalquivir River course has been modified through the construction of canals, locks, and by dredging its depths. As indicated by the WFD, the characterisation of a river basin requires information on the major economic drivers and pressures at river basin scale. The Guadalquivir River basin can be considered a representative Mediterranean case study that has faced basin closure and continues the trend towards increased crop intensification and greater water-use efficiency (Tocados-Franco, et al. 2023). In some other cases (e.g. Abbeyleix Bog), the European policy frameworks, though relevant for providing high-level strategic context, are not expected to provide any concrete support, unless such framework(s) are prioritised and implemented with clear and achievable statutory objectives at the national and regional levels.

Poor support from European policies for wetland restoration was also highlighted in the questionnaire responses for the additional KS: four sites assessed the support from the European directives as "poor", while two sites assessed this support as relevant. The KS located in England did not benefit from any support, being outside of the European Union. However, the Water Environment (Water Framework Directive) (England & Wales) Regulations 2017 (referred to as the WFD Regulations) provide a framework for managing the water environment in England. One of the reasons for poor policy support was the late accession of some countries (Poland), after restoration had already started or been completed.

National policies

National policies reflect European policies through the transposition of EU Directives in national legislation. However, for some KS the presence of additional specific national and subnational policies for restoration emerged as highly relevant. For the Venice Lagoon, the role of the Special Legislation to safeguard the city of Venice and its lagoon (national law since 1973 that only applies to Venice) is extremely important for the governance of this KS. It guaranteed a very important source of funding which allowed it to achieve several objectives (both in terms of research and in terms of implemented projects) but also had some negative consequences by causing some imbalances in power sharing. In Poland (Calowanie Fen and Kampinos), national objectives for surface water bodies were established in a national programme for surface water restoration (NPSWR), that followed the first update of the RBMPs in Poland. However, these objectives have not been effectively translated into the second update of the RBMPs. A 2022-2032 draft strategy for the protection of wetlands in Poland was prepared at the end of 2021. While there are currently no estimates in terms of budget, it should encourage further restoration activities in Polish wetlands in order to achieve its objective, but it has

still not been adopted. The implementation of both plans is a major challenge for Poland due to the high degree of transformation of rivers (over 90%) and peatlands (85%).

The questionnaire revealed that two KS have considered the role of national policies as being very supportive (Engbertsdijksvenen, NL and iCASP Yorkshire, UK). Four KS assessed the role of national policies as poor while no support was highlighted by one KS (Germany). For the English KS, the National Peat Action Plan (that funds restoration through Nature for Climate Fund) contributes to the implementation of the CBD. For the other KS included in the questionnaire, national policies are found to be directly related to European policies. Expectations are high for the upcoming EU Nature Restoration Law (see section 4.2) which will require strong implementation at the national level.

A non-exhaustive list of national policies relevant for KS is presented in Table 6.2 below.

Country	Strategies/tools	Objectives
Ireland	**National Peatlands Strategy 2015-2025**	Aims "to provide a long-term framework within which all of the peatlands within the State can be managed responsibly in order to optimise their social, environmental and economic contribution to the well-being of this and future generations".
Spain	**Strategic Plan for Wetlands (2022-2030)**	Avoid, retain and reverse the loss and degradation of wetlands in Spain, contributing to guaranteeing (i) the maintenance of habitats and species that sustain and their capacity to provide essential ecosystem services, (ii) boost their recovery and (iii) achieve their enhancement and the recognition of multiple benefits they provide
France	**Fourth National Action Plan for Wetlands (2022-2026)**	Renews the ambitions for the protection of wetlands: it continues the efforts undertaken in the wake of the previous plan (2014-2018) and expands the actions in favour of the knowledge, protection and restoration of wetlands.
Italy	**Special Legislation for safeguarding the city of Venice and its Lagoon (1973)** **National Strategy for biodiversity (2022-2030)**	Venice and its lagoon are declared as paramount national interest National commitment to contribute to the international goal of ensuring that by 2050 all ecosystems on the planet are restored, resilient and adequately protected.
Bulgaria	**National Action Plan for Conservation of Wetlands of High Significance in Bulgaria (2013–2022)**	The plan provides the foundation for planning and implementation of conservation and sustainable management of Bulgaria's most significant wetlands.

Poland	**National Strategy for the Protection of Wetlands in Poland 2022-2032 (draft)**	National Strategy (in public consultation), for the improvement of peatland biodiversity, reduction of greenhouse gas emissions and improving the state of biodiversity and supporting natural processes in aquatic ecosystems and increasing water retention in riverside areas
Sweden	**National environmental objective: Thriving Wetlands**	Supports the conservation, restoration, establishment and management of wetlands. It contributes to the fulfilment of Sweden's obligations under the Ramsar Convention, the Convention on Biological Diversity, and EU Birds and Habitats Directives.
Germany	**National Peatland Conservation Strategy 2021**	Restoration and sustainable management of drained peat soils, along with the protection of intact peatlands.
United Kingdom	**National Peat Action Plan 2021**	National plan that establishes long-term vision for the management, protection and restoration of UK peatlands
Estonia	**Nature Conservation Development Plan until 2020** **Development plan for adapting climate change 2030;** **Estonian Climate Policy 2050**	Restoration of degraded mires and abandoned peat mining areas to conserve nature, adapt to climate change and decrease carbon emission
The Netherlands	**Engbertsdijksvenen Natura 2000 management plan**	Management plan with three levels of objectives (landscape scale, site level and habitat and species level) that aim at protecting the remaining raised bog areas, while fixing the hydrology and reducing nitrogen levels. It also aims at developing active raised bogs, restoring peat areas as well as preserving and improving a list of important species.

Note: Information mainly gathered by the WaterLANDS partners (KS contacts) through interviews and questionnaires.

Funding sources

Almost all KS have benefitted from European funds, in particular the LIFE Programme, the EU flagship instrument for the environment and climate action. However, some barriers limited the access to this fund. In the case of Karrendorf Meadows (Germany), the LIFE programme was not considered since the national contribution and governance requirements were considered too challenging and would have fitted better for larger projects.

Funding from International Financial Institutions (e.g., the Global Environment Facility and the World Bank) were mentioned in only one KS (Belene, Bulgaria). National (and subnational) public funds were also used for wetland restoration in almost all KS. Moreover, the role of private donors is not negligible. For example, in the Abbeyleix Bog, a semi-state company that manages Irish peatlands (Bord na Móna), in cooperation with the National Parks Wildlife Service (NPWS), recognising the value of the site after bowing to local pressure not to cut the bog and to lease it to the community. NPWS was slow to provide support at the beginning, but their staff enthusiastically supported the project. In

the Camargue region, a multinational beverage company supported some restoration works to achieve the common goal of preserving freshwater. Additional examples of private sources of funding come from the wetlands of Germany and the UK where water companies have funded restoration on their own lands to secure clean water. (Karrendorf meadows, iCASP Yorkshire).

Gathering adequate funding to restore wetlands and set up monitoring programmes is a cross-cutting endeavour. Considering the questionnaire results, it has emerged as one of the strongest barriers to restoration (see section on Success and Limiting factors, section 5.2.2). Three KS that participated in the questionnaire considered funding "not sufficient". Three other KS considered funding "sufficient", while only one site (Mazury Forest) considered funding as adequate to complete restoration measures and monitoring programmes. In this case, multiple sources were used, including national dedicated funds for nature and environmental protection (Poland's Eco-Fund, Voivodeship environmental protection fund).

In general, more funds are needed especially for maintenance and monitoring activities, to assess and ensure restoration results in the long term. The European Regional Development Fund (ERDF) can also support wetlands restoration projects through its focus on a green, low-carbon and resilient Europe. Interreg Med projects such as CREW, WETNET and TUNE UP or Interreg NWE CARE-PEAT provide such opportunities by addressing governance, management and monitoring issues.

7. Theoretical governance framework

In this chapter, we present the strengths, opportunities, weaknesses and threats of the four different types of theoretical governance models (section 6.1) that emerged from the analysis of KS and which are supported by literature review: monocentric, polycentric, community-based and networking governance models. As previously highlighted in this report and shown by the analysis of the KS, models are theoretical abstractions. In real life a governance system cannot be easily categorised into a specific model since it can be a combination of different models. Community-based systems and networking systems are not opposed to polycentric or monocentric systems, but they are focussed on the role of specific groups (citizens for community-based initiatives) or relations between different actors (networking systems).

Based on the analysis and the four governance models identified, we present a Theoretical Governance Framework for successful wetland restoration made of the three Pillars mentioned briefly above (see section 4.1). A list of recommendations to improve the governance system for successful wetland restoration is provided. This list has been assembled by consulting several knowledge sources and by considering lessons learnt from KS. Recommendations are complemented by proposals for possible concrete actions to implement them as well as by some examples of good practices offered by KS.

7.1 Governance models

7.1.1 Polycentric governance model

Rationale

The authority for this governance model is shared in various ways among a number of different and autonomous parties, including government and non-government agencies. Cooperative processes between different decision makers and co-creation mechanisms are the core attributes of polycentric governance. Polycentric governance systems are generally multiscale and cross-sector, to better deal with the complexity of socio-ecological systems.

Strengths

One of the most commonly cited theoretical advantages of polycentric governance systems is that they may be capable of adapting to actual or anticipated social and ecological change better than more centralized forms of governance. This is often termed as “adaptive capacity”, that means the capacity to respond to experienced or expected changes in the environmental or socio-economic conditions (Carlisle et al., 2019). This can occur by changing rules and roles of the governance structure in a continuous improvement process, according to the learning by doing concept.

Another advantage is that a polycentric governance structure is designed upon the specific features and needs of the natural area to be a “good fit” for that natural resource system. The concept is often termed “institutional fit,” i.e. the match or congruence between an institution and the problem or need it is meant to address (Carlisle et al., 2019).

In this regard, a multiscale and cross-sector governance system is likely to better suit the task of governing complex ecological systems. Multiscale is needed because local-level decision makers, though best suited to react quickly to specific challenges, may lack the power to address the most complex issues, relying on higher levels of governance (regional, national institutions). This is even more important for transboundary areas that need cooperation with neighbouring countries. Cross sector is needed because ecological systems require to be addressed in an integrated way, bringing together complementary knowledge owned by different institutions and stakeholders. For instance, in polycentric governance for wetland restoration, authorities responsible for nature conservation have the opportunity to collaborate with authorities responsible for flood risks and for water management, establishing “win-win” solutions with multiple benefits for multiple sectors.

Polycentric governance systems can also mitigate the risk of institutional failure (Carlisle et al., 2019, Munaretto and Huitema, 2012) and resource losses due to their “redundancy”. Redundancy can make these systems less vulnerable since different institutions can take over the functions of other institutions in case of failure.

Moreover, the hard and challenging process of identifying a common vision and agreeing on the objectives and methods to achieve wetlands restoration should finally result in an easier and faster process of project implementation.

Finally, polycentric governance systems entail mutual learning that directly derives from the collaboration of different actors with different skills, interests and roles.

Opportunities

Polycentric models of governance are possible when there are multiple decision making centres with power and interest in ecological restoration. Recognition of multiscale aspects of natural resource governance is particularly important.

A key enabling factor for polycentric governance is the consolidated presence of formal (signed agreements, contracts) or informal mechanisms (platforms, forums, working tables) designed to bring decision makers together to support the decision making process. River Contracts, Delta Contracts or Wetland Contracts are some examples of effective formal instruments that can favour the implementation of polycentric governance systems.

Similarly, the presence of formal or informal mechanisms (presence of already established platforms, working groups and forums for sharing visions) for conflict resolutions may be particularly important in polycentric governance systems due to the diversity of governance actors with varying political positions, roles and resources.

The increasing attention of the international scientific community to nature-based solutions (NBS) is another opportunity for boosting polycentric modes of governance. As a new approach, it generates innovative ways to address old problems and more inclusive practices. Collaborative, multisector, polycentric and adaptive governance models have been considered the more suitable governance models for NBS projects. Drivers such as coordination, co-production, cross-sectorial cooperation and reflexive/adaptive governance are drivers that address a significant number of identified cross-domain barriers showing the suitability of these kinds of governance models for NBS projects (Egusquiza et al., 2019).

Weaknesses

Since decision making in polycentric governance systems is shared among governmental and non-governmental actors, the authority and responsibility for successful restoration risks being dispersed among several actors, possibly losing accountability and lack of clarity.

Polycentric governance strongly depends on the collaboration between different actors working at different governance scales and requires a culture of willingness to work together (Munaretto and Huitema, 2012). Coordinating all institutions requires high effort, which is very challenging and not easy to test in real life. If collaboration mechanisms between various parties are not properly designed, the expected functionalities of polycentric governance may be reduced, or even inhibited.

Without a genuine intent to share power among decision centres, collaboration between different scales of governance are deliberately non-functional or have high transaction costs, creating and intensifying conflicts and competitions between the state and local governments (Mudliar, 2020).

It is intuitive that the higher the number of actors involved, the more difficult it is to reach a common decision in the short term. This can cause progressive disinterest from parties and stagnation, hampering the actual implementation of environmental measures.

Finally, polycentric governance systems may suffer from redundancy (presence of multiple actors with similar functions). Even though redundancy is seen as a strength point of this model of governance (mitigating the risk of failure of the system), it may entail additional costs and may be inefficient in taking decisions in a timely manner.

Threats

Low interest in participation can be a significant threat to efficient polycentrism. Participation is particularly challenging in contexts with traditionally top-down and highly hierarchical institutions, where communities and other groups have not traditionally had a substantial input in decision making (Orchard et al., 2016).

In some countries, legal constraints can limit the possibility to establish formal and legally binding agreements between parties, such as wetlands contracts. Simplified agreements can be established (e.g. memorandum of understanding). However, these agreements do not have financial commitment for the signers, nor budget provisions, so that their strength is lower (Interreg MED TUNE UP, 2021).

Setting up a new polycentric system involves complex processes of change. Limited experience and lack of guidance to implement fully effective polycentric systems, can inhibit this type of governance as well as limiting the evaluation of effectiveness (Morrison et al., 2019).

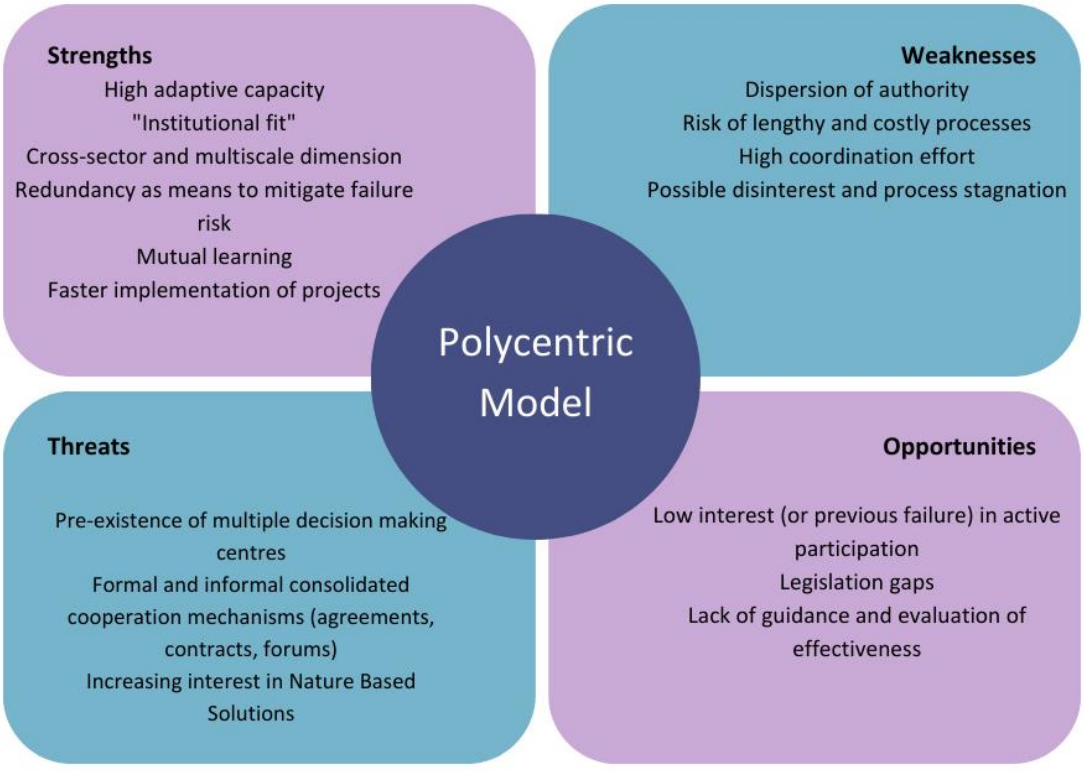


Figure 7.1 - Polycentric model: synthesis of strengths, weaknesses, opportunities and threats

[NOTE: The numbering of the recommendations in each box refers to the table in section 7.2 below. For each model, some recommendations from the three pillars are highlighted. The key recommendations have been generated from the analysis of governance successes and limiting factors reported by the KS WaterLANDS]

Key recommendations for polycentric systems

1.3 Improve systems to collate evidence on the environmental and socio-economic impacts of restoration

1.5 Encourage debate among different visions, promoting mutual learning and constructive criticism

2.2 Define a governance structure that represents key partners and stakeholders with clear rules

2.3 Clearly define appropriate responsibilities and roles of the different institutions involved

3.2 Ensure a legal basis for the governance structure

3.5 Evaluate and guide progress of restoration actions and outcomes on the basis of regular monitoring

3.9 Learn from others and create conditions for knowledge exchange.

7.1.2 Monocentric governance model

Rationale

Hierarchical modes of governance are often featured with the dominance of one actor (often the state) over other actors in decision making (Zeijl-Rozema et al., 2008). Most countries have a three-level governance system, e.g., national government, provinces, and municipalities, with vertical relations between the leading actor and other actors. Power of the lower-level governments is generally restricted by the higher level (Termeer et al., 2010). The centre of political power and authority exerts control in setting goals by a top-down implementation of policies.

Strengths

Monocentric governance systems are characterised by clear division of responsibilities and roles of different institutions. Compared to polycentric models, this condition can make the decision-making process more straightforward, quicker and cheaper. Hierarchies, whenever well defined and mutually accepted, can offer consolidated ways of collaboration between different involved actors that can lead to efficient management of restoration challenges.

Responsibility (both for success and failure) is clearly identifiable. Especially, regarding urgent matters, a reduction of complexity can be seen as a positive element that has the potential to accelerate decision-making processes (Termeer et al., 2010).

Monocentric governance systems do not exclude participation processes that are at the basis of all European policies. Some authors have argued that public participation may be easier in monocentric systems than in polycentric systems, since it is easier to provide feedback to the public if there is only one (governmental) center of power than if there are many (Morrison et al., 2019).

Opportunities

Existing legal frameworks that establish hierarchical relations between different institutions involved in wetlands conservation and restoration are a key enabling factor for setting up monocentric governance systems.

Opportunities for this kind of governance are also offered by the presence of institutions with long histories, proven competence, interest and decision-making power in terms of ecological restoration.

Weaknesses

Monocentric systems are often characterised by poor collaboration between different institutions. Citizens and stakeholder's participation, whenever present, is not often a characteristic of hierarchical systems. Stakeholders may have a very minor role in decision making, being consulted at a late stage of the projects or with limited possibility of intervention. Moreover, their involvement is often conditioned by rules and procedures set by government institutions (Edelenbos et al., 2021).

Since monocentric governance is dominated by the perspective of one leading decision centre, an oversimplification of problems can be experienced (Zeijl-Rozema et al., 2008). In the case of wetlands, this over-simplification can lead to the omission of important interlinkages that ecosystems can have with different economic sectors and land uses. The consequences could be the delivery of unwanted side-effects of some activities authorised by other authorities outside the system (e.g. drying up of wetlands due to hydraulic works in connected water bodies) or the transfer of problems to other spheres (e.g. conflicts with farmers due to the rewetting of wetlands for conservation purposes).

The dominance of one single perspective in wetland restoration activities (the leading authority, often the national one), can cause other requests or local requests to be ignored creating an uneven distribution of the benefits of restoration.

Finally, monocentric governance systems can be considered more vulnerable in case of institutional failure, since they lack redundancy. Failure of one institution (especially the dominating one) in achieving expected results cannot be compensated by other institutions that do not have enough authority to act.

Threats

Institutional failure may be a threat for monocentric governance systems that are less prepared to react to risk than polycentric systems.

Another threat may come from stakeholders' opposition to certain decisions taken by the leading actor without a wide participative approach or agreement. Opposition can lead to tensions, protests and lack of institutional trust that weaken the authority itself.

Unexpected challenges, new problems and emerging environmental issues can mean that the leading institution is not properly prepared to address them. In this case, the set up of a completely new authority could be needed as well as more effective horizontal and vertical cooperation. More collaboration between neighbouring jurisdictions could be required or even a different authority able to work within different geographical boundaries. The amalgamation or merger of authorities into larger units or structural reforms to the establishment of new dedicated authorities able to address new problems, are common responses to such threats of monocentric governance systems (Termeer et al., 2016).

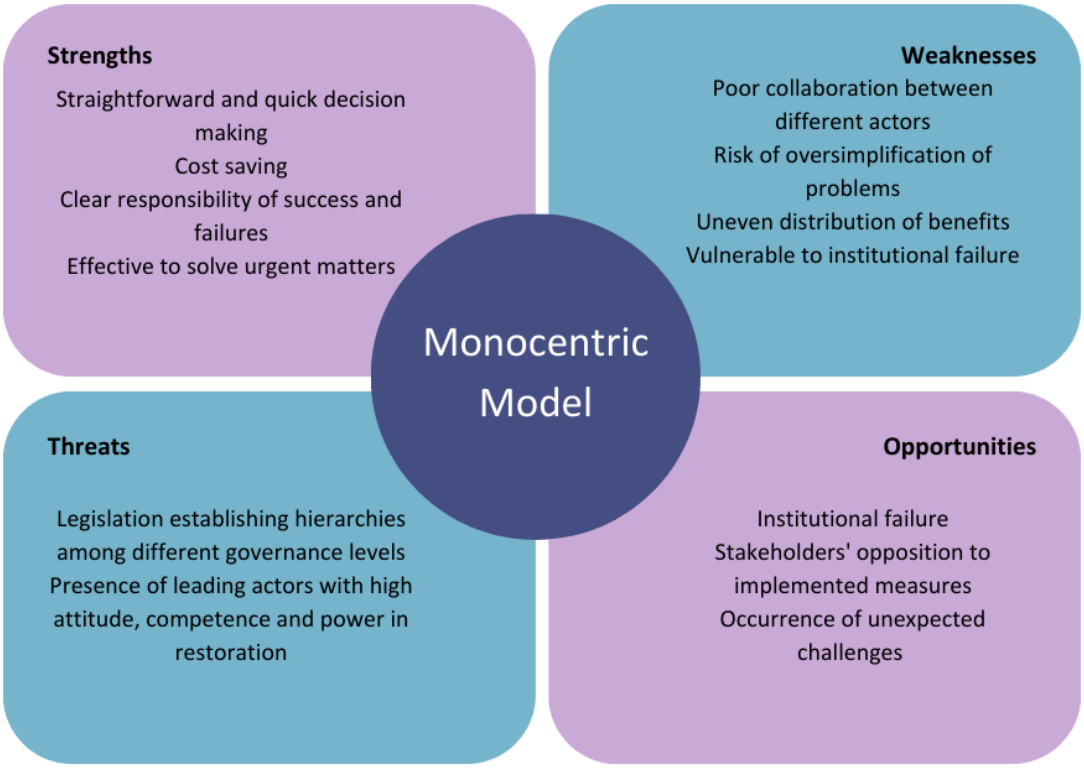


Figure 7.2 - Monocentric model: synthesis of strengths, weaknesses, opportunities and threats

Key recommendations for monocentric systems

1.3 Improve systems to collate evidence on the environmental and socio-economic impacts of restoration

1.4 Early involve all interested parties, including vulnerable groups (who can be affected by or who can benefit of) restoration, groups and sectors who may not be represented by formal associations, local government actors, public and private research institutions

1.6 Ensure an efficient, continuous, timely, effective, stimulating, transparent and free information flow

2.4 Adapt the governance structure and complexity to each context

2.8 Recognise stakeholder participation among the founding principles of governance

3.3 Adopt a flexible approach to governance and management, according to the learning by doing approach (cycle: plan, implement, evaluate, learn and adapt), in a continuous improvement process, based on incremental results.

3.6 Mainstream wetland conservation into other policy documents

3.7 Establish relationships with neighbouring governance bodies

7.1.3 Community-based governance model

Rationale

In governance systems dominated by community-based initiatives, the authority is owned by a group of citizens or private actors with a strong interest in restoring wetland sites. Proactive groups may be supported by or linked to formal institutions, such as local authorities, governmental agencies, especially for funding and facilitation. In successful CBIs, citizens catalyse governance, take the lead in formulating a vision for the area, and collectively initiate and implement projects aimed at providing public goods or services for their own (Scarlett and MacKinney, 2016; Edelenbos et al., 2021). This type of model is particularly suited for small-scale restoration activities and for locally-oriented issues.

Strengths

CBIs are often characterised by high motivation of citizens or other private actors in changing long-standing problems. Citizens, often acting as volunteers (Edelenbos et al., 2021), have a sense of attachment to local issues and this reinforces their commitment to be proactive parts of decision making. CBIs can also be influencers and supporters of local government through active and collaborative partnerships (Henfrey et al., 2022).

CBIs are often also supported by strong charismatic leaders (Edelenbos et al., 2021), who are trusted by the group and by other institutions involved. When well organised, CBIs are often heterogeneous in their composition, leading to a redundancy and diversification of capacities and functions, which in turn enhances the system's overall performance, because several elements of the systems can ensure the same functions in case another element fails to do so. When leaders leave, a heterogeneous composition within CBIs can enable them to remain stable through time with their smooth replacement.

As polycentric governance systems, CBIs offer the opportunity of mutual learning, by bringing together people with different skills, interests and roles. They help to create joint solutions and capacity building, while also fostering communities in themselves with their own networks of volunteers, ecologists, advisors and scientists (Flood et al., 2022).

Opportunities

Community-based governance models usually emerge when there is inadequate support for ecological restoration from the state, cutbacks in funding or inefficient consolidated governance

structures. However, CBIs are integrated in socio-cultural contexts (Henfrey et al., 2022) and do not work in isolation: governments or NGOs may provide a range of services and support functions for CBIs (Alexander et al., 2016, Edelenbos et al., 2021). Indeed, a key opportunity for CBIs is the presence of collaboration mechanisms between the communities and the institutions. The consolidated presence of technical advisory groups, composed of various expertise and community representatives together with local authorities involved in restoration (parks authorities, municipalities, regional authorities etc), can act as a bridge between the needs of the community and the constraints posed by authorities.

Social networks may play an important role in facilitating the connection within the community to raise citizens' interest in conservation and restoration.

Finally, an opportunity that can boost community based governance systems comes from ecosystem services provided by wetlands. Whenever the site provides tangible ecosystem services recognised by the local population, such as for livelihoods (food and water resources), cultural and recreational values, this can motivate groups of citizens to promote conservation and restoration activities.

Weaknesses

By their nature, community-based initiatives are locally oriented. In this sense, they can be unsuitable for large wetland sites, especially if they span across different administrative boundaries or are located in transnational areas.

The coordination of a community's representatives with institutions requires high effort and capacity, often relying on the skills of individuals and mediators. The success can also depend on the capacity of communities to effectively use resources or to complete complex grant applications (Flood et al., 2022).

If collaboration tools between various parties are not properly designed, the potential performance of community-based initiatives may not be realised. Without proper support from the institutions, communities may have little influence on decision making. To confront this issue, community-based governance often aligns itself with national organisations, NGOs or translocal networks that seek to strengthen local action via collaboration, collective learning, pooling and sharing resources, and mutual support (Henfrey et al., 2022).

There is a general lack of systematic knowledge about the performance of community-based initiatives. The acclaimed performance often remains largely hypothetical, as literature with empirical proof is still quite scarce and based on a handful of case studies (Edelenbson et al., 2021).

Threats

Similar to polycentric systems, legal constraints can limit the possibility to actually establish bottom-up forms of governance that might not be properly recognised by governmental authorities. Limited experience in bottom-up approaches in countries where top-down approaches have historically dominated can hinder the full development of CBIs.

Moreover, CBI can be hindered by limited, inconsistent or unpredictable resources (Flood et al., 2022): including the aforementioned financial resources, such as grant aid, but also human resources (e.g. the number of volunteers can change over time, as well as the time that volunteers can dedicate).

Finally leadership emerged as crucial in community-led restoration projects (Edelenbson et al., 2021) and often rests on having a strong leader within the community. This dependency on the skills or abilities of key individuals in building relationships can make the governance system quite unstable over time.

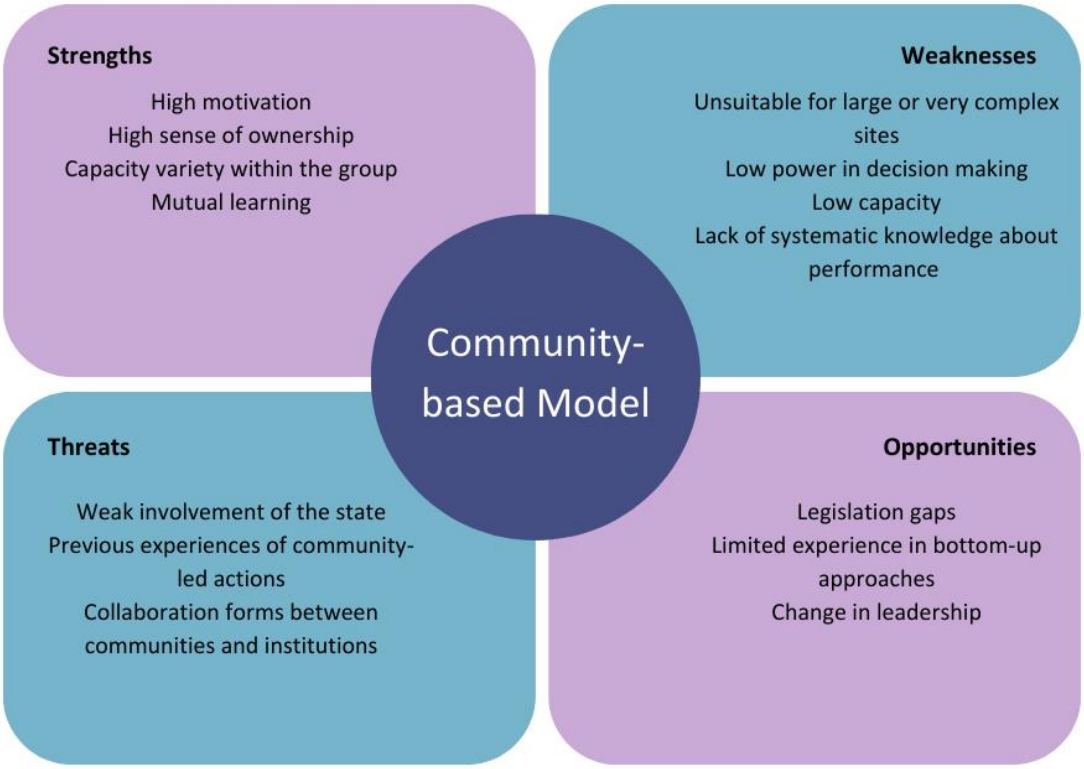


Figure 7.3 - Community-based model: synthesis of strengths, weaknesses, opportunities and threats

Key recommendations for community-based governance systems 1.2 Encourage pilot projects to reinforce knowledge, political support and partnerships

2.1 Clearly define a governance structure with responsibility and skills in restoration activities

2.4 Adapt the governance structure and complexity to each context

3.2 Ensure a legal basis for the governance structure

3.3 Ensure a stable, though flexible, governance system over time

3.5 Evaluate and guide progress of restoration actions and outcomes on the basis of regular monitoring

3.7 Establish relationships with neighbouring governance bodies

3.9 Learn from others and create conditions for knowledge exchange

3.11 Ensure restoration is adequately resourced with funding and human resources adequate to address socio-ecological complexity

7.1.4 Networking governance model

Rationale

In governance systems dominated by networking models, the authority (owned by a single institution or shared amongst different parties) generally has a limited ability to make decisions by itself, but is potentially supported by neighbouring governance bodies, existing networks of wetlands or protected areas, and multilateral organisations committed to the protection of wetlands and biodiversity. This model is not an alternative to polycentric or monocentric governance, but emerges from within existing governance contexts. Strengths, opportunities, weaknesses and threats depend on the main governance context of which they are part. The added value of this model is that it is particularly suited for wetlands that are close to regional and national borders, cover a transnational or transregional area or are affected by large-scale impacts of human activities.

Strengths

Governance networks are presumed to generate benefits by promoting interaction between organisations, agencies, and other actors through which conservation decisions are made and actions are taken (Alexander et al., 2016). By connecting people and places (also including neighbouring countries), they facilitate knowledge exchange and social learning.

One of the added values of joining a network is its potential to attract or reinforce the interest of other parties and increase national and international visibility. This can increase the possibility to meet new people and enlarge contact webs, generating potential joint participation in further restoration.

Opportunities

Low prioritisation of environmental issues at the national level can stimulate efforts to find new partners outside of national borders and opportunities to fund restoration actions, using International Financing Initiatives.

Global environmental funds and other financial mechanisms (GEF, Word Bank, European Investment bank), provide not only financial supports for projects that promote the conservation, restoration, management and enhancement of natural resources, but may also offer or support technical assistance (e.g. baseline studies, training and capacity building, vulnerability assessment etc).

Networking governance can emerge when the governmental or non-governmental agencies involved in conservation and restoration realise that they cannot solve a particular issue by working independently. This can result from agencies' acknowledgement by low capacity, limited funding sources or low power in decision-taking, but also from the need to address natural resources with a broader scope and wider scale. In fact, the impetus for networking can derive from the nature of the challenges associated with wetland restoration, many of which transcend jurisdictional boundaries.

This may require cooperation between different states, negotiations to solve long-standing issues or macroregional actions (Scarlett and McKinney, 2016).

Weaknesses

Networks not only provide, but they also demand resources, especially in terms of time and capacity that local institutions may not have.

Results may not be achieved in the short term: developing international relationships can be a long-term investment. Governance systems that strongly rely on the participation in networks and collaboration with multilateral organisations may not be suited to solve urgent matters.

As highlighted in polycentric systems, networking requires a certain openness to collaboration, which is not necessarily easy for many actors and institutions. If collaboration mechanisms between various actors are not properly established, the expected added value of this governance system may be reduced or even inhibited.

Threats

Similar to community-based governance models, the legal framework can limit the possibility of actually establishing networking governance systems that transcend current hierarchies and the roles of different governmental institutions. Limited experience in cooperation, especially with other countries, can be a barrier for successful networking, as well as different socioeconomic contexts and cultures. In transnational networks, language can be an additional barrier that makes communication difficult between different parties. Moreover, the possibility to count on long term and stable financing is a potential threat for scaling up restoration activities.

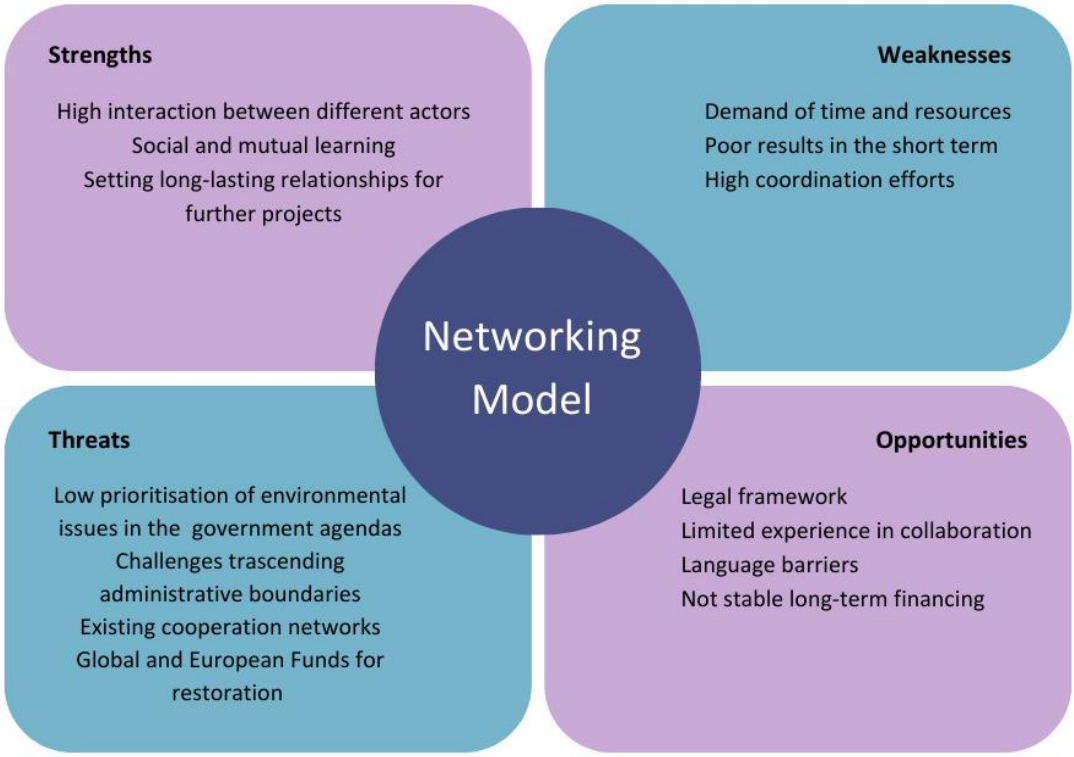


Figure 7.4 - Networking model: synthesis of strengths, weaknesses, opportunities and threats

Key recommendations for networking governance systems 1.2 Encourage pilot projects to reinforce knowledge, political support and partnerships

3.1 Promote the designation of the wetland as "protected area" or other effective area-based management measures at regional, national and international level (Natura 2000, Ramsar site etc.)

3.2 Ensure a legal basis for the governance structure

3.3 Ensure a stable, though flexible, governance system over time

3.7 Establish relationships with neighbouring governance bodies

3.9 Learn from others and create conditions for knowledge exchange

3.11 Ensure restoration is adequately resourced with funding and human resources adequate to address socio-ecological complexity

7.2 Recommendations and governance principles

The literature review conducted as part of this work to explore the conditions for successful governance has revealed a long list of recommendations for improving current governance systems. Although they have been formulated in various contexts (e.g. governance of natural resources, Mediterranean coastal wetlands and protected areas) their general concepts can be easily adjusted, transferred and applied to most wetland restoration projects. Moreover, additional specific recommendations emerge from the analysis of governance success and limiting factors reported by the WaterLANDS KS.

The following three tables bring together recommendations gathered from different knowledge sources. Recommendations are categorised according to the three Pillars of the ideal governance framework conceived in the WaterLANDS project (see also section 4.1) and represent a contribution towards the creation of a Safe Operating Space for wetland restoration efforts, recalling the concept of planet boundaries from Rockstrom et al. (2009).

In order to support practitioners in taking action, each recommendation is complemented by a list of possible concrete measures and by examples (good practices) inspired by KS.

Table 1 - Recommendations for Pillar 1[14]

Pillar 1: Co-creation and communication "From informing stakeholders to involving them to foster ownership of the restoration effort."			
Topic	**Recommendations**	**Actions**	**Examples from Knowledge Sites**
Awareness raising and capacity building	**1.1** Promote awareness raising and understanding amongst the public and policy and decision makers about the benefits of restoration to minimise opposition and scepticism	- Provision of information materials, organisation of public events, environmental education initiatives and outdoor activities. - Unleash creativity and innovation: arts and media can be opportunities to enhance the provision of cultural ecosystem services of wetlands (Multiplying initiatives around arts, heritage, and culture)	Abbeyleix Bog: a number of initiatives around arts, heritage and culture is improving awareness about the value of the bog, previously associated with poverty and an unhealthy system. Yorkshire: The peatland restoration project (iCASP programme) produced a user-friendly interface for a digital modelling tool[15] which informs what peatland restoration activities can do to optimize ecosystem service delivery. A guide was also prepared to support practitioners.
	1.2 Encourage pilot projects to reinforce knowledge, political support and partnerships	- Participation in EU LIFE Projects or similar initiatives	Venice lagoon, Doñana, Kampinos and Całowanie: the participation in EU LIFE Projects contributed to know-how building, increased participation and awareness about restoration potential
	1.3 Improve systems to	- Involvement of the	Doñana: The biological station provides the scientific basis for restoration activity

[14] Own elaboration from Knowledge Sites and from the following sources: PAP-RAC, 2019; Wetland-based Solutions, 2021; IUCN, 2013; Cortina-Segarra et al., 2021, Eftec, 2017, TUNE-UP, 2021, Mediterranean Coastal Wetlands Governance Project- Lessons Learned

[15] https://icasp.org.uk/projects-2-2/opr/

	collate evidence on the environmental and socio-economic impacts of restoration	scientific community - Collection of data and information	
Inclusion/dialogue	**1.4** Involve early all interested parties, including vulnerable groups (who can be affected by or who can benefit from) restoration, groups and sectors who may not be represented by formal associations, local government actors, public and private research institutions	- Stakeholders mapping - Organisation of meetings at the early stages of restoration process - Support in the proactivity of associations of citizens, really interested in ecological restoration and worried about ongoing degradation caused by human activities	Kampinos: early involvement of citizens in two LIFE projects: Kampinos Wetlands (2013-2019) and Kampinos WetLIFE (2020-2026). Local people were initially sceptical towards the project, but after their involvement in dissemination activities, a more supportive and collaborating environment was established
	1.5 Encourage debate among different visions, promoting mutual learning, and constructive criticism	- Organisation of interactive workshops to collect and compare different visions of the wetland use - Inclusion of multiple objectives (environmental, social and economic) in the	Kampinos: a number of workshops and meetings are planned within Kampinos WetLIFE (2020-2026). They are expected to mitigate conflicts and generate other regional and international initiatives for wetland protection. Całowanie: new opportunities offered by paludiculture were discussed during workshops Doñana: the site is inscribed in the European Charter for Sustainable Tourism in Protected Natural Areas Belene: A Visitors Centre was established to encourage ecotourism activities and raise awareness on the importance of wetlands and biodiversity

		restoration and development plans and strategies - Map, assess and early address potential or observed conflicts between different uses - Search for synergies between different uses, also encouraging sustainable practices (tourism, agriculture) that can coexist with restoration	
	1.6 Ensure an efficient, continuous, timely, effective, stimulating, transparent and free information flow	- Preparation of a communication strategy since the beginning of the process that covers the entire duration of the restoration project - Definition of a dedicated team/structure capable of managing the flow of information - Definition of comms. means (websites, newsletter, social media)	Doñana: The Doñana ICTS (Singular Scientific-Technical infrastructure) supports scientific research activities. It manages all environmental data from monitoring activities and their access.

Table 2 - Recommendations for Pillar 2[16]

Pillar 2: Design and implementation "Agreeing with stakeholders on a set of principles and rules to guide restoration efforts"			
Topic	**Recommendations**	**Actions**	**Examples from KS**
Governance structure	**2.1** Clearly define a governance structure with responsibility and skills in restoration activities	- Definition of an official name and mandate of the main governance body - Attribution of the management authority and responsibility to capable governmental and non governmental actors (the closest to the issue of natural resources)	Abbeyleix Bog: The Abbeyleix Bog Project Ltd was founded as a governance body from a previous association of residents with the aim to restore the bog. The Abbeyleix Bog Project negotiated a 50 year lease for the site management
	2.2 Define a governance structure that represents key partners and stakeholders with clear rules	- Identification of a multi-stakeholders Committee - Definition of an administrative structure to the governance body	Camargue: A restoration project committee involving all categories of local stakeholders was created. It includes the landowner, the three site managers and the Centre Permanent d'Initiatives pour l'Environnement (CPIE) Rhône – Pays d'Arles, assisting with organising and facilitating the consultations. The mayor of Arles, the Water Agency and local governmental actors are also involved Abbeyleix Bog: the governance is a 'three -tier system'. It is composed of (1) a Board of Trustees which ensures the various aspects of the lease are adhered to; (2) a Technical Advisory Group (TAG), and (3) a eight-member Management Committee.

[16] Own elaboration from Knowledge Sites and from the following sources: PAP-RAC, 2019; Wetland-based Solutions, 2021; IUCN, 2013; Cortina-Segarra et al., 2021, Eftec, 2017, TUNE-UP, 2021, Mediterranean Coastal Wetlands Governance Project- Lessons Learned

Roles and rules	**2.3** Clearly define appropriate responsibilities and roles of the different institutions involved	- Creation of a legal basis for the definition of roles and rules - Identification of a promoter in charge of coordinating the governance structure in the long term	Venice: Responsibilities and roles are defined in the Special Legislation for safeguarding Venice and its lagoon. The role of national, regional and local authorities is clearly defined.
Governance scale	**2.4** Proportionate the governance structure and complexity to each context	- Adequate consideration to the wetland size and the environmental and the socio-economic context in which it lies - Establish environmental contracts that are fit for purpose	Venice: the complex governance system of the lagoon of Venice reflects the high complexity of the socio-ecological system and is currently limiting the ecological restoration. The new Authority for the Venice Lagoon is intended as a unique subject able to assume all competences presently distributed among various different actors.
	2.5 Clearly define the most appropriate and comprehensive spatial scale of governance without overcomplicating matters.	- Definition of natural boundaries for restoration (going beyond local and administrative limits) - Maximisation of synergies with management units already in place in the area (e.g. for the river basin management plans	Całowanie: Regional factors (large-scale impacts of groundwater extraction outside the wetland) are causing the drying process of wetlands, weakening the success of restoration activities carried out inside the wetland area. A higher and overarching vision for the governance of the site is needed to consider a more comprehensive spatial scale. Engbertsdijksvenen: the restoration project is based on a holistic approach, that considers the nature reserve as part of a wider area: measures are being implemented both within and outside the reserve, in a comprehensive vision of the area

		according to the EU Water Framework Directive)	
Vision and principles	**2.6** Develop and follow an inspiring and overarching strategic vision grounded on agreed values and an appreciation of the ecological, historical, social and cultural complexities unique to each context	- Definition of a clear vision for the wetland - Engagement of stakeholders in setting the vision - Development of alternative scenarios ("what if" visions of the future)	Doñana: the presence of an overarching strategy able to guide the restoration interventions with a long term vision would have improved the success of the measure implemented Belene: the international agreement for the lower Danube Green Corridor set up ambitious objectives for a large Danube area that also include Belene. The local restoration project provided a contribution to the large-scale objectives.
	2.7 Adopt the ecosystem-based approach to governance	- Mapping and assessment of ecosystem services, before and after restoration - Creation of a transdisciplinary group to understand restoration success and limiting factors - Incorporation of Nature-Based Solutions able to achieve multiple benefits for the environment and the society	Abbeyleix Bog: Carbon sequestration was assessed before and after the intervention. Two ecotope surveys were prepared: in 2009, to assess the baseline and in 2020 to assess the impacts of restoration works.

	2.8 Recognise stakeholder participation among the founding principles of governance	- Definition of a participation process from the beginning of the wetland restoration, with the widest stakeholder representation possible	Abbeyleix Bog: A consultation process was at the basis of the Abbeyleix Bog Conservation Management plan 2015-2020. The plan was issued after a consultation process which consisted of meetings with the project's Technical Advisory Group (TAG), public consultation meetings and various exchanges with numerous stakeholders

Table 3 - Recommendations for Pillar 3[17]

Pillar 3: Sustainable legacy "Ensuring that the outcomes of an ecosystem restoration effort endure in time and space."			
Topic	**Recommendations**	**Actions**	**Examples from Knowledge Sites**
Legal designations	**3.1** Promote the designation of the wetland as "protected area" or other effective area-based management measures at regional, national and international level (Natura 2000, Ramsar site etc.)		Doñana: the area is an internationally recognised site for conservation: UNESCO Biosphere Reserve (1980), UNESCO World Heritage Site (1994), Ramsar Wetland Site (1982), Natura 2000 site
	3.2 Ensure a legal basis for the governance structure	- Endorse a foundation document ('Constitution' or 'Terms of Reference') to: set out vision, goals and objectives; establish the decision-making process; confirm the commitment of partners; define their responsibilities and	Abbeyleix Bog: The Abbeyleix Residents for Environment Action (AREA) was a citizen's association that founded a community-led limited company (Abbeyleix Bog Project Ltd).

[17] Own elaboration from Knowledge Sites and from the following sources: PAP-RAC, 2019; Wetland-based Solutions, 2021; IUCN, 2013; Cortina-Segarra et al., 2021, Eftec, 2017, TUNE-UP, 2021, Mediterranean Coastal Wetlands Governance Project- Lessons Learned

		functional aspects such as the secretariat	
Adaptive long-term approach	**3.4** Ensure a stable, though flexible, governance system over time	- Creation of wetland contracts: formally adopted agreements (signed by all partners) and binding in terms of liability, financing, and timing. - Collection of feedbacks on the level of efficiency, effectiveness and performance of the process	Venice: the Wetland Contract of the Northern Lagoon Camargue: the Camargue Delta contracts. Concrete restoration activities were implemented with national funds.
	3.5 Evaluate and guide progress of restoration actions and outcomes on the basis of regular monitoring	- Definition of a Monitoring, Reporting and Evaluation System - Develop monitoring protocols, standards and flexible indicators for track ecological restoration	
Policy	**3.6** Mainstream wetland conservation into other policy documents	- Integration of wetland conservation into land-use planning, and other sectors plans, by actively	Camargue: The coastal restoration project is fully consistent with the guidelines adopted by the Direction départementale des territoires et de la mer (DDTM) of the Bouches-du-Rhône, which is the authority in charge of marine submersion risk management in the Camargue.

		involving local authorities - Integration of wetland conservation in regional and local climate change strategies and plans - Direct participation and strict involvement of the governance structure in regional and local planning initiatives	
Networking	**3.7** Establish relationships with neighbouring governance bodies	- Participation in networks of wetlands/protected areas - For transnational wetlands or wetlands close to country borders, international agreements with neighbouring countries	Camargue: the Mediterranean Alliance for Wetlands brings together several organisations from across 15 countries to support civil society organizations and research institutions working to protect, restore, and sustainably use Mediterranean wetlands and rivers. Belene: the site is part of the DANUBEPARKS association, a network of Danubian protected areas founded in 2014. The area is also part of the International Agreement for the Lower Danube Green Corridor Abbeyleix Bog: ABP Project is part of the Community Wetlands Forum (CWF) which aims to provide a representative platform for community-led wetland conservation groups based on the principles of community development (empowerment; participation; inclusion; self-determination; and partnership).
		- Promotion of alliances that involve local civil society and other stakeholders in wetland landscapes to allow for collective reflection of	Yorkshire: Restoration of blanket peats are carried out by the six peatland partnerships across the North of England. Peatland partnerships are umbrella organisations funded by governmental and non-governmental authorities for the conservation of these habitats

		values and long term communication	
	3.8 Promote public-private partnerships	- Signing of contracts with private companies that are interested in co-funding restoration - Signing of contracts with private parties, to preclude some uses that conflict with restoration - Land acquisition from private parties (e.g. farmers)	Camargue: A partnership with a private beverage company was created. The company co-funded restoration works Abbeyleix Bog: Restoration works were supported by the company that had acquired a large part of the bog with the intention of bringing it into commercial production for peat extraction. Kampinos: 145 ha of private area (previously parcelled in 167 sites and owned by private actors) were purchased by the National Park within the Kampinos Wetlands project, while new areas (80 ha) are planned to be acquired within the Kampinos WetLIFE project Kampinos: multi-actor agreements for an optimised water management of the site were signed, involving the National Park, local authorities and Polish Water (Wodie Polskie, former Provincial Management Board of Land Reclamation and Water Facilities).
	3.9 Learn from others and create conditions for knowledge exchange	- Exchanging of good practices (through national and international platforms, e.g. Oppla, Climate-ADAPT, Panorama solutions)	Camargue: a case study showing the relevance of restoration for climate change adaptation was published in the EU Climate-ADAPT platform
Economic resources	**3.10** Take up of existing EU funds: cleary map key potential funding sources and the conditions within which these can be	- Participation in EU funded projects (especially Life Programme)	Venice Lagoon, Doñana, Kampinos and Całowanie: Funds coming from the EU LIFE Programme contributed to economic restoration goals

	activated		
	3.11 Ensure restoration is adequately resourced with funding and human resources adequate to address socio-ecological complexity	- Participation in project funded by Global Environmental Funds (GEF, World Bank) - Make use of dedicated funds for restoration	Belene: Restoration works were performed within a project funded by GEF iCASP Yorkshire: The England Peat Action Plan funds restoration through the Nature for Climate Peatland Grant Scheme

8. Conclusion

There is no one-size-fits-all solution for successful governance of wetland restoration. The best governance model depends on the specific socio-ecological and socio-economic context. Moreover, each governance model has both strengths and weaknesses. They can be catalysed or hindered by context-specific opportunities and threats. Wetland restoration mediators working at, and between different levels to address conflicts play a crucial role in ensuring transparency, help all voices to be heard and taken into account and bridge the communication gap between the different actors. It is also important to determine who will make the final decision in the chain of governance and for all actors to be aware of this. Depending on the governance structure in place, this should be clear from the beginning to manage stakeholder expectations in the governance process and to understand the power balances.

Polycentric governance models are well described in the literature as an alternative to monocentric systems, to emphasise a new form of governance characterised by shared responsibility of public and private actors, co-creation and a collaborative environment. However, the actual experience of governance is often one of mixed approaches with different degrees of polycentrism and monocentrism. Systems that are apparently polycentric due to the variety of actors involved in decision making, may suffer from lack of coordination or be dominated by certain leading authorities. Conversely, **monocentric governance systems**, dominated by consolidated and well-established hierarchies, may include straightforward and effective participative approaches, actually working like polycentric systems.

Community-based governance systems and **networking ones** are not substitutes for other forms of governance, but can emerge within existing (polycentric or monocentric) governance contexts. They generally emerge when there is weak government capacity or commitment to tackle environmental or social issues. Citizens can be the catalysers of some ecological restoration actions, especially for small-size wetland areas. As highlighted in the 6.2 Results section, community governance actors can be powerful allies in bringing about change to established systems of governance and decision-making. Networks (between cities, regional authorities or states) can enable the prioritisation of environmental issues in government agendas and may be especially relevant for transnational wetlands or wetlands close to national borders.

All governance models rely on the co-creation of restoration measures, by bringing together heterogeneous actors, or addressing one of the major challenges of restoration: close the gap between those who are potential beneficiaries of the ecosystem services provided by wetlands and that value them and those that have the authority to manage ecological restoration.

This report provides several recommendations (drawn from the literature and concrete examples) that can help wetland practitioners and authorities to remove barriers to wetland restoration and to compensate for the weaknesses of the various existing governance models. The 25 recommendations provided in this Theoretical Governance Framework, complemented by more than 50 possible concrete actions and more than 20 examples of good practices from KS, are a tool to support the implementation of the three Pillars of the ideal governance framework built in this deliverable.

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WaterLANDS

Annex to Deliverable 3.1. Characterising supportive governance and policy

31st May 2023

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Plan Bleu (Regional Activity Centre - UNEP/Mediterranean Action Plan)

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Annex: Factsheets on governance systems in selected Knowledge Sites

Abbeyleix Bog, Ireland: a community-led governance for restoration

Description

Abbeyleix Bog is a partially drained raised bog that has undergone some restoration over time. Abbeyleix Bog is situated on the southern end of Abbeyleix town, Co. Laois, Ireland. It encompasses an area of almost 200 hectares of diverse habitats including degraded (but recovering) raised bog, lagg, cutaway, wet carr woodland, and meadows.

Abbeyleix Bog was initially ruled out as a potential Natural Heritage Area by National Parks and Wildlife Service (NPWS) during a review of candidate bogs in Ireland. In fact the area was considered as of limited ecological value, being heavily affected by drainage works carried out during the last century to transform it into a commercial site production. However, in 2014, the site was included by NPWS in a review of the raised bog Natural Heritage Area network. This new assessment was aimed at re-evaluating how the NHA network could contribute towards the National conservation target of restoring Active Raised Bog to favourable conservation status.

As of January 2023, the site does not have national designation as a Natural Heritage Area.

The site is currently utilised on a daily basis by walkers and nature enthusiasts. Its natural value is being progressively improved after the restoration works carried out since the early 2000s. Abbeyleix Bog is of national conservation value due to the importance of the high bog habitats as well as the presence of rare lagg areas such as petrifying springs, fen and wet woodland.

Challenges

Abbeyleix Bog has been historically impacted by various human interventions that strongly affected its ecological value. In 1865 the bog was split into two separate parts by the Portlaoise to Kilkenny railway in North-South direction. The line remained in use for approximately a century, closing on January 1st 1963. After a number of decades, Bord na Móna (BnM), a semi-state company, acquired a large part of the bog with the intention of bringing it into commercial production for peat extraction. A considerable network of drains were installed to drain the area, despite local opposition. After several years and a number of legal challenges, the drainage works were halted and a restoration programme started to recover the ecosystem.

Implemented restoration measures

Restoration works consisted of approximately 64 kilometres of drains being blocked with peat dams. Restoration works were carried out in 2009, after a baseline ecotope survey. A follow-up survey in 2020 demonstrated the success of the restoration work implemented so far. In this regard, a significant increase in the area of Active Raised Bog (ARB, the wettest and least damaged vegetation on a raised bog) was observed, from 1.12 ha in 2009, to 3.19 ha in 2014 and to 13.78 ha in 2020,

equating to a 12.66 ha increase in ARB in eleven years. The CO2 emissions reduced from 443.3 tonnes per year in 2009 to 209.9 tonnes in 2020 (- 52.7%). A clear upward trend in carbon sequestration was also observed, from only 2 tonnes CO2 per year in 2009, to over 25 tonnes per year in 2020 (for central and sub-central ecotopes).

The 2020 ecotope survey advocates a further programme of restoration to complete the works and meet the minimum criteria set by the 2017 Guidelines for raised bog restoration (Mackin et al., 2017). Following these recommendations and the Proposed Restoration Plan (2018), the Abbeyleix bog project was recently awarded new funding by the Irish government's Peatland Community Engagement Scheme. This funding, €75,000, allowed for more engineering works being implemented (2022), so as to restore additional sections of the peatlands. The Peatland Community Engagement Scheme seeks to encourage local peatland communities, local groups, local schools and individuals to engage with the Department of Housing, Local Government and Heritage in relation to the conservation and revitalisation of fens, raised and blanket bog Special Areas of Conservation, Natural Heritage Areas and other peatland areas and to promote public engagement with and awareness of our natural heritage.

Main actors, roles and mutual relationship

Bord na Móna (BnM) is a semi-state company founded in the 1930's to develop peatlands for energy and jobs in the Irish midlands. It has rebranded as a climate solutions company although it still sells peat for horticultural use (Flood et al., 2022). It had acquired a large part of the Abbeyleix bog to transform it into a commercial production site for peat extraction. Bord na Móna, in cooperation with the National Parks Wildlife Service, funded the restoration works, recognising the value of the site, after that a nine-year confrontation to save the bog was performed by local residents.

The Abbeyleix Residents for Environment Action (AREA) was a citizens association which had a key role in halting the drainage works, providing strong opposition to the commercial exploitation of the bog. In 2009, stemming from AREA, a dedicated committee, the Abbeyleix Bog Committee, formed a community-led limited company not for profit (Abbeyleix Bog Project Ltd).

The Abbeyleix Bog Project negotiated a 50 year lease for the site from BnM in 2012. It is currently the main authority that manages conservation at Abbeyleix bog site..

Decision making process

From the beginning, the key objectives of Abbeyleix Bog Committee were to positively enhance the conservation and education value of the site while retaining and improving upon the existing amenity value.

The decision making process is led by the local community through the Abbeyleix Bog Project.

A 'three -tier system' provides transparency and ensures the community retains autonomy in driving and managing the project. The system is composed of (1) a Board of Trustees which ensures the various aspects of the lease are adhered to; (2) a Technical Advisory Group (TAG), and (3) an eight-member Management Committee. The TAG consists of one representative each from Bord na Móna,

the National Parks and Wildlife Service (NPWS), the Irish Peatland Conservation Council (IPCC) and County Laois Council representatives, as well as four community-appointed representatives. The Management Committee meets regularly to discuss and approve various plans for the peatlands. The management committee is advised by the TAG to ensure that plans for the bog do not impact the fundamental conservation objectives of the lease. All involved are voluntary workers, our volunteers and their efforts are key to our future.

The 2009 restoration works were based on a wide consultation process that brought together a number of key stakeholders, including the NPWS, Bord na Móna and members of the local community, with a common view to restoring the habitat of the bog.

A consultation process was also at the basis of the Abbeyleix Bog Conservation Management plan 2015-2020. The plan was issued after a consultation process which consisted of meetings with the project's Technical Advisory Group (TAG), public consultation meetings and various exchanges with numerous stakeholders. The purpose of the Abbeyleix Bog conservation management plan 2015-2020 is to provide an understanding and establish a framework for which the local community, under the guidance of the ABP Ltd, can practically manage and further develop the resource. ABP is currently working with various stakeholders to design and implement a post-rehabilitation monitoring regime.

Strategic and planning instruments

A draft management plan for the bog was firstly produced in 2008 and guided the works began on its implementation in 2009, to block the 64 km of drains on the high bog sections of the area with peat dams.

The Abbeyleix Bog Conservation Management Plan 2015-2020 was issued to provide an understanding and establish a framework for which the local community, under the guidance of the ABP Ltd, can practically manage and further develop the resource.

The 2015 plan has three key objectives: (1) maximise restoration and conservation of habitats of ecological value; (2) develop the site as a research and educational centre and (3) maximise the community involvement in developing the site's potential as a recreational, environmental and social amenity. The Conservation plan made a total of 108 recommendations of actions to be considered and undertaken by the ABP. A consultation process was also at the basis of the Abbeyleix Bog Conservation Management plan 2015-2020. The plan was issued after a consultation process which consisted of meetings with the project's Technical Advisory Group (TAG), public consultation meetings and various exchanges with numerous stakeholders. The purpose of the Abbeyleix Bog Conservation Management Plan 2015-2020 is to provide an understanding and establish a framework for which the local community, under the guidance of the ABP Ltd, can practically manage and further develop the resource. ABP is currently working with various stakeholders to design and implement a post-rehabilitation monitoring regime.

In 2018, the Technical Advisory Group produced a new Proposed Restoration Plan with the objective to identify the main steps to be followed in the restoration of high bog and cutover habitats at the site, in the short (0-1 year), medium (2-3 years), and long term (4-5 years).

Lessons learnt

Success and Limiting factors

The main success factor was the active role of the citizens, firstly organised in an association and then legally incorporated in a community-led limited company. Legal incorporation can help show the seriousness of community-based actions.

Bord na Móna has supported the restoration together with the National Parks and Wildlife Service, while volunteers have contributed to the restoration works. A coordinated action by public and private actors, alongside community involvement, is extremely relevant.

Actions have been guided by conservation and restoration plans that have to balance various aspects of conservation of the site (infrastructure management, rehabilitation, invasive species management, recreation, etc). A coherent vision is vital and needs to inform collaborative planning that stakeholders and decision-makers across the landscape can buy into.

Over the years there have been numerous ecological and hydrological studies, from which have emerged metrics to track and evaluate success. Large landscapes need rigorous monitoring with agreed tools and methodologies, quality assurance, evaluation, learning and development plans. The more complex a landscape, the more important it becomes to understand whether interventions are really working.

The project revealed the importance of intangible values and aspects, not always easily measurable through indicators and metrics. Indeed, the Abbeyleix Bog Project success story has encompassed not only demonstrable positive environmental and ecological progress, but educational and recreational benefits. Multiplying initiatives around arts, heritage, and culture are improving awareness about the value of the bog. Indeed, bogs are often still associated with poverty and an unhealthy system, with controversial feelings.

Moreover, continuity and coherence of actions are as much needed at site level (conservation management plan of the site), at national (support from the National Parks and Wildlife Service) and international level. In this regard, the ABP Project is part of the Community Wetlands Forum (CWF) which aims to provide a representative platform for community-led wetland conservation groups based on the principles of community development (empowerment; participation; inclusion; self-determination; and partnership). The support from the government through the Peatland Community Engagement Scheme was crucial in favouring new opportunities for restoration. Conversely, European and national policy frameworks, though relevant for providing high-level strategic context, do not provide any concrete support for Abbeyleix restoration, unless such framework(s) are prioritised and implemented with clear and achievable statutory objectives on a national and regional level.

Finally leadership is crucial in community-led restoration projects and often rests on having a strong leader within the community.

Replication

The success of the first restoration programme favoured the awarding of new funding by the Irish government's Peatland Community Engagement Scheme. This new funding has allowed the implementation of restoration works in additional sections of the peatland.

The positive impacts achieved with the restoration effort serves as an excellent example for other community-led projects that can be implemented elsewhere, in Ireland or other countries.

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Doñana wetland, Spain: a scattered land tenure struggling between conservation and development policies

Description

Doñana wetlands are part of a National Park, located in Andalusia, Southwestern Spain. The area is an internationally recognised site for conservation that was declared UNESCO Biosphere Reserve (1980), UNESCO World Heritage Site (1994), and Ramsar Wetland Site (1982). The National Park (designated in 1978) is surrounded by a Nature Park that together form the Doñana Natural Space (111,645 ha). Furthermore, in 1988, the National Park was declared a "Special Protection Area" under the EU Birds Directive 79/409 and is currently part of the Natura 2000 Network established by the EU Birds Directive and EU Habitat Directive 92/43. The site is also inscribed in the European Charter for Sustainable Tourism in Protected Natural Areas.

Doñana contains one of the largest wetland complexes in Western Europe, lying in the right bank of the estuary of the Guadalquivir River, that flows into the Atlantic Ocean. The site includes temporary lakes and ponds, a small peat lake, streams, floodplain wetlands, marshlands and estuarine wetlands. The vast coastal marshland complex, subject to seasonal variations in water level and salinity, is separated from the ocean by an extensive dune system. The site is also a wintering site for hundreds of thousands of birds.

More than 3000 water bodies are found in the dune depressions of Doñana. Most of them are temporary water bodies, emerging during the wet season only. Ponds are mainly filled by the rise of the water table after heavy rains, with a high level of inter-annual variation in the aquatic communities. Some natural ponds have been deepened to supply water for domestic and wild animals, converting them into permanent water bodies.

Until the 18th century, the Doñana marshes were largely tidal, but gradually the marine influence was reduced. Most of the wetlands currently have a continental character, while some areas are fed by sea water only during high tides.

Challenges

The original extent of the natural marshland was far larger than the current one. During the 18th-19th century, the national Spanish authorities promoted the conversion of marshes for the purpose of sanitation (against malaria) and risk control (flooding), while private companies started to maximise the economic profit, especially from agriculture.

A large part of marshland has been converted to different uses (as rice fields, cultivated areas, fish farms or salt ponds) or completely drained. Rivers, streams and various arms of the Guadalquivir were deeply transformed, being closed off, channelized or dredged to allow navigation to the port of Seville. A system of dikes along various streams was built to recover land from marshes and in1984 a large dike was built on the right side of Guadalquivir river, providing an artificial separation from the adjacent marshes. In 1998 the site experienced an ecological and socioeconomic disaster when the Aznalcóllar mine spill (ca 60 km away from Doñana) contaminated the Guadiamar River and the adjacent areas with sludge rich in heavy metals.

Since 1990, Doñana National Park is included in the “Montreux Record”, a list of Ramsar sites where changes in ecological character have occurred, are occurring or are likely to occur, because of technological developments, pollution or other human interference

Agricultural activities and other human uses require a large volume of groundwater that currently exceeds sustainable limits. In 2020 the Spanish Authorities declared some aquifers officially overexploited. This has given rise to fears that the Outstanding Universal Value (OUV) of Doñana, recognized by the Unesco World Heritage Convention, is in danger from lack of water due to this agricultural water use. The issue of the drying out Doñana wetlands has been brought to the media attention.

Implemented measures

In the 1960s, after the profound transformations occurred until the first half of the past century, a new conservation movement began to emerge contrasting a sustainable economic development. In 1963 WWF and the Spanish Government purchased a portion of the area for conservation objectives. Stronger conservation efforts materialised with the designation of the Doñana National Park in 1978.

Six major restoration projects (plus a number of more local interventions) took place in the Donana wetlands from 1981 up to nowadays:

(1) "Plan de Regeneración Hídrica de Doñana", presented in 1981 and executed between 1984 and 1987;

(2) Renaturalization of the Abalario dune complex, with the removal of Eucalyptus afforestation and the restoration of natural vegetation and temporary/peat lakes, in 1993-2005;

(3) "Corredor Verde del Guadiamar, restoration of the river inflow affected by the Los Frailes mine spill in 1998, implemented in 1999-2003;

(4)"Doñana 2005", drafted in 2001, with a number of interventions that ended in 2015.

(5) Renaturalization of the agricultural area of Los Mimbrales, acquired by the State in 2015.

(6) Restoration of the area affected by the Moguer forest fire, which affected 8,486 ha of woodland and shrubland, including several sandy lakes, at the Doñana Natural Space.

Restoration works included a wide range of measures aimed at improving the hydrological dynamics of the basin (restoration of inflowing streams and river branches, removal of dikes to reconnect the system with the estuary), re-establishing marshes (closure of drains, floodplain/marshland restoration), and restoring morphological features and vegetation (reshaping of ponds, removal of afforested vegetation and tree crops, revegetation).

The “Doñana 2005” restoration project, promoted by the central government of Spain, has particular relevance. The project was aimed at partially recovering the natural dynamics of the Doñana marshland. It included the restoration of over 5,000 ha of agricultural land back to marshland by eliminating the drainage system.

Main actors, roles and mutual relationship

Since 2006, all planning and management activities of Donana Natural Space (previously under the state control) are implemented at the regional level by the Government of Andalucía in coordination with the national authorities (Ministry of Ecological Transition and Demographic Challenge, and Ministry of Culture). The Doñana National Park and Natural Area (that together form the Doñana Natural Space) are managed by the Andalusian Regional Authority.

The regional administration and management of the Doñana Natural Area is carried through the Management Team. This team is structured around two main areas: (1) Conservation and (2) Management. These two areas are directed and coordinated by the Director of the Doñana Natural Space.

Since 2006, there is also an advisory body called the Doñana Natural Space Participation Council, which is made up of the President, Vice President, Secretary and the Members representing the Administration of the Junta de Andalucía, the State Administration and the Local Administration, organisations and social and economic agents and the scientific community. The Participation Council of the Doñana Natural Space, in which all stakeholders are represented, plays an important role in bringing different views together.

The Doñana Biological Station is a research institution of the Spanish Research Council (CSIC – Consejo Superior de Investigaciones Científicas). The biological station manages the conservation of two biological reserves of the park (the Doñana Biological Reserve and the Guadiamar Biological Reserve), having the highest level of conservation in the Park. The Doñana ICTS (Singular Scientific-Technical infrastructure) supports the scientific research activities by running a long-term biodiversity monitoring programme, managing field laboratories and facilities (e.g., automated sensors), providing technical and logistic support for field work, and managing all environmental data and their access.

Finally the Fundación Doñana is a public entity integrated into the organic structure of the Consejería (regional ministry) of Sustainability, Environment and Blue Economy. It aims at playing a key role in the socioeconomic development of Doñana. For example, it was tasked with coordinating the participation process for the preparation of the Second Plan for the Sustainable Development of Doñana.

Decision making process

Since the designation of the Doñana National Park, the decision making process was influenced by the need to find some convergences between the conservation policies and the development policies. Extensive preparatory studies and multi-stakeholder meetings were carried out as part of several restoration projects, but the presence of several land uses and contrasting interests have led to conflicts. Stakeholders usually complain that they are involved at a late stage, only to gain legitimacy for measures already designed.

Indeed, the area presents a scattered land tenure model, with a mixture of privately-owned land (e.g. agricultural area), common land (for pastoral use), state-owned land, and NGO-owned land, with many uses that create potential conflict.

A constructive cooperation between the Park, the Participation Council and most parties involved in conservation efforts has been established, as recognised by the Reactive Monitoring mission, a joint UNESCO/IUCN/Ramsar Unesco mission run in 2020 to investigate the current threat coming from the overexploitation of aquifers. The role of the Doñana Biological Station in providing the scientific basis for conservation and management was also recognised.

Strategic and planning instruments

An initial attempt to harmonise conservation policies and development policies was done with the preparation of the First Plan for the Sustainable Development of Doñana 1993-2000, approved by the European Commission with a budget of 372 million euros. Following the transfer of the management from the central (national) to the regional governance level (Junta de Andalucia), a second Sustainable

Development Plan was conceived in 2005 and finally issued in 2010. The plan was prepared by the regional environmental directorate (Consejería de Medio Ambiente) with the support of a dedicated Coordination Commission (Comisión de coordinación) and of the Fundación Doñana 21 that coordinated the participation process. Municipalities belonging to the Doñana Natural Space and stakeholders from various economic sectors were officially involved in the participation process.

The plan is based on the values of sustainability, innovation and diversification, with the integration and participation of local actors as its backbone.

Lessons learnt

Success and Limiting factors

The role of the Participatory Council (representing different interests), working with the regional and national authorities and all interested parties has been recognised as a successful element of governance of Doñana to achieve and maintain conservation objectives.

The presence of adequate funding allocated to the Park and of a highly qualified team of people managing the site was another success factor. In this regard, the Doñana Biological Station has a key role in providing the scientific basis that guides restoration and conservation activities.

Global policies (obligations for the Ramsar Convention) and European policies (Natura 2000 provisions and Water Framework Directive) clearly supported restoration activities. However, some elements of the same policies weakened the restoration process. They include, for instance the presence of complex and poorly applicable procedures and metrics for the classification of the ecological state of water bodies, as well the inclusion of the lower part of the Guadalquivir River amongst the “highly modified” water bodies, with the consequent lowering of its quality objectives.

Conversely, the restoration works were affected by the presence of multiple actors and interests. The presence of multiple uses and tenure rights has made the management of the site very complex. Several uses created conflicts with conservation that the National Park had to address. Moreover, major changes in the managing authorities over time (from national to regional ones) and in political views created lack of clarity and in some cases, lack of coherence between various interventions.

The presence of an overarching strategy able to guide the restoration interventions with a long term vision would have improved the success of the measure implemented. The challenges posed by both surface and groundwater exploitation, especially for agriculture and tourism, highlight the need for a comprehensive vision at a larger spatial scale than that of one of the remaining Doñana wetlands.

Replication

The governance model can be replicated in other contexts. It is composed of a regional management team supported by a participatory council representing multiple interests at different spatial levels. A research institution provides the scientific basis for restoration, while a foundation for socio-economic development has a key role in bringing together various economic interests. The restoration approach and the sustainable development model of Donana were used by the management team to implement

similar activities in other areas (Integrated Strategy for Palma de Mallorca, and Andalusian forestry areas at the Life Adaptamed Project).

Conversely, dysfunctionalities in the current governance system are also reported and are currently hindering the implementation of future plans of restoration (Doñana 2030).

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Camargue former saltworks: a governance structure that followed a change in land ownership

Description

Camargue is an UNESCO's Man and Biosphere Reserve, a Special Protection Area under the EU Natura 2000 network and a RAMSAR site. It includes the oldest and one of the largest Nature Reserves in mainland France: the Camargue National Nature Reserve (established in 1927).

The Regional Natural Park of Camargue is an area of 85,000 hectares, established in 1970. The former saltworks of Camargue represents a vast coastal area of 6,500 ha that includes the municipalities of Arles and Saintes-Maries-de-la-Mer.

The Camargue is of international importance for nesting, staging and wintering water-birds. The area is also an important place for human activities such as tourism, sea sports and recreational hunting.

Challenges

The former saltworks of Camargue are located in the south-eastern part of the Rhône delta, in the Camargue Regional Natural Park. From 1950 to 2008 the area was intensively transformed to ensure industrial salt production, with major changes occurring between 1950 and 1970. Evaporation and crystallisation ponds were created for salt extraction, disconnecting previous natural water bodies. A seafront dyke allowed for a complete artificial control of sea water that was used to be artificially pumped during spring and summer periods. As a result, the wetlands were highly saline and were therefore only suitable for salt-tolerant species. Moreover, the Rhône River was canalised and inland dikes were built for flood protection. The lack of sediment inputs from the Rhône River as a result of its canalisation has had important impacts on dune formation, erosion and water dynamics. This overall transformation resulted in a deep alteration of the ecological conditions of the area.

After the acquisition of a large part of the site by the Conservatoire du Littoral and the dismissal of salt production, a restoration programme started. Other restoration projects started in the Camargue region for the reconversion of former farmlands into wetlands (Petit Badon and Cassaïre properties).

Some years after the former saltworks' restoration started, the salt company retracted on the previous decision and decided to maintain ownership of the heart of the water circulation in the site and to keep some land to continue salt production. This change has had an important impact on water management and biodiversity objectives for the site.

New challenges are now especially related to the water management of the area (conflicts between restoration goals and commercial interests related to salt production). Moreover, the area is highly vulnerable to sea level rise, as 70% of the Camargue delta is located at an altitude of less than 1 m.

Implemented restoration measures

The restoration programme (started in 2011) of the former saltworks is aimed at restoring the natural hydrological functioning of the system, reconnecting the various water bodies (inland lagoons, the Rhone River and the Mediterranean Sea) that were previously used for salt production and restoring the natural gravitational flow. The programme also included the restoration of the natural ecosystem characteristics of the coastal lagoons and sandy coastlines, including dunes, salty vegetation and saltmarshes.

The interventions encompassed the rehabilitation of gates (or the creation of new ones) to ensure connections between water bodies, the restoration of the gravitational flow, the dredging of channels, the abandonment of the seafront dyke (allowing the water to move freely between the lagoons and the Mediterranean Sea) and the adjustments of the inland dykes to protect the territory from flooding. The intervention strategy was based on Nature based Solutions and on an adaptive management approach.

Part of the works were implemented in the framework of the European LIFE+ MC-SALT project (2011-2016). National funds came from the Water Agency and the Region, and from private companies.

An intensive biodiversity and hydrological monitoring system is in place, operated by the site managers.

Main actors, roles and mutual relationship

The Regional Natural Park of the Camargue (site manager) is a public authority that is part of the national networks of regional parks. It is managed by a multidisciplinary team and its operation is based on open decision-making processes and regular consultation with the territory's stakeholders.

The Conservatoire du littoral is the French national coastal protection agency. It is a public administrative establishment of the State placed under the supervision of the national Ministry who holds responsibility for nature protection (Ministry of Ecological Transition and Territorial Cohesion). The Conservatoire du littoral is represented locally by 10 regional delegations. Camargue is under the delegation of Provence-Alpes Côte d'Azur. Conservatoire du littoral is currently the landowner of the former saltworks of the Camargue.

Tour du Valat is a Research Institute for the conservation of Mediterranean wetlands. It is a private institute with the legal status of a non-profit foundation that works in the public interest. It manages the restoration programme of the former saltworks of Camargue together with the National Society for Nature Protection (SNPN) that is the responsible authority for the Camargue Natural Reserve.

The Permanent Center of Initiatives for the Environment Rhône-Pays d'Arles is a territorial strategic facilitator of the ecological transition. It cooperates and acts on a daily basis with the institutions, the inhabitants and all the actors of the territory. It is a member of a national network which federates 80 associative structures on the national territory.

The Water Agency (Agence de l'Eau Rhône-Méditerranée-Corse) is a public authority under the Ministry of Ecological Transition and Territorial Cohesion, dedicated to the preservation of water. It is one of the main funders of restoration projects.

Decision making process

Different governance systems are in place for the restoration of different wetlands in the Camargue region. For the former saltworks, the restoration process was put in place by the Regional Natural Park of the Camargue (coordinating manager) working in partnership with the Tour du Valat and the National Society for Nature Protection (co-managers) under the aegis of the Conservatoire du Littoral (landowner).

A restoration project committee involving all categories of local stakeholders was created. It includes the landowner, the three site managers and the Centre Permanent d'Initiatives pour l'Environnement (CPIE) Rhône – Pays d'Arles, assisting with organising the consultations. The mayor of Arles, the Water Agency and local governmental actors are also involved.

Since January 2021, the CPIE has been supporting the Conservatoire du littoral and the 3 co-managers of the site (the Camargue Regional Natural Park, the Tour du Valat and the National Society for the Protection of Nature) as a mediator and organisation in charge of the consultation on the development of the management plan. He has been hired to work with around twenty players in the area (representatives of hunting, fishing, breeding, contracted players on the site, local associations, etc.) in order to integrate them into the development of the management plan. The latter, once validated, will be in place for a period of 10 years.

Two main Delta contracts have been implemented in the Camargue region. The first contract was mainly related to setting the ground for collaboration between different stakeholders, while concrete restoration activities were especially implemented in the second contract, with funds from the Water Agency (Agence de l'Eau Rhône-Méditerranée-Corse).

Other experiences came from two Interreg Med projects (WETNET and TUNE UP) focusing on wetland contracts and MPA contracts respectively. The wetland contract for Verdier marshes (WETNET) is still active, while the MPA contract (TUNE UP) for the former saltworks was a more limited experience, mainly based on the development of a communication plan and a management plan.

Strategic and planning instruments

A first simple management plan was drawn up in 2012 in order to guide the restoration project.

A new management plan (ten-year management plan) has been completed and it is currently in the validation process.

The coastal restoration project is fully consistent with the guidelines adopted by the Direction départementale des territoires et de la mer (DDTM) of the Bouches-du-Rhône, which is the authority in charge of marine submersion risk management in the Camargue. The strategy consists of allowing the coastal line to move freely with the natural formation of sandbars, while maintaining and reinforcing existing infrastructures to protect people and property further inland.

Lessons learnt

Success and Limiting factors

The change in land ownership (from the salt production company to the Conservatoire du Littoral) was the key factor that triggered restoration works. Ecological restoration was then supported both by national funds and by EU funds (Life Project). The Water Framework Directive and Flood Directive worked as a strong policy framework that supported restoration actions. The Barcelona Convention and its ICZM protocol are also relevant for the area.

The case study is an example of how humans can help nature to recover its functionality, by implementing Nature-based Solutions and an adaptive management approach. The measures

implemented in the former saltworks are progressively making the coastal ecosystem more resilient, working as a buffer area able to mitigate the impacts of climate change.

Conflicts between restoration and economic interests (salt production, fresh water use) act as limiting factors. Indeed, part of the area is still owned by the salt company which still has some power over the use of the water and whose activity depends on the presence of highly saline waters. On the contrary, the need to have fresh water had prompted a private company to co-finance the ecological restoration activities led by Tour du Valat which therefore in its turn undertook to achieve certain objectives.

Therefore, water management (and in particular the salt content of the water) is a key issue for site management, which is currently addressed by the management plan.

The local population's acceptance of the sea dike abandonment (to restore sea water natural flow), is another key issue to address. People don't feel protected enough with Nature Based Solutions and ask for dyke maintenance. An overall future looking strategy to address population's safety considering sea level rise due to climate change, is under preparation.

Replication

Restoration activities carried out in the former saltwork area are not expected to be further upscaled, since the project already covered a quite large area. Replication is also hindered by land tenure, since most of the land is owned by private actors in the Camargue region. Replication of smaller restoration intervention (as those performed at the Cassier marshes, outside the saltwork area) can be replicated more easily, based on the monitoring results.

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Lagoon of Venice: a complex governance system fragmented with many institutions and multiple interests

Description

The lagoon of Venice is located in North-East Italy, spans 550 km² and is one of the biggest wetlands in the Mediterranean area; salt marshes cover an area of about 40 km2. The lagoon receives freshwater inputs from the watershed (through 27 entries from rivers, channels and dewatering pumps) and it exchanges water with the Northern Adriatic Sea through three inlets. About 87% of the

total 550 km² lagoon surface is open to the tide, with the semi-closed surfaces occupied by fish farming. The drainage basin, formed by an intricate network of rivers, streams and artificial channels, extends over a surface of more than 2000 km2 wide and hosts about 1 million inhabitants; the cities of Venice and Chioggia and 50 other minor islands are located inside the lagoon. Moreover, the presence of the industrial area of Porto Marghera, the port (industrial, commercial and touristic) and the airport bordering the lagoon strongly increase the complexity of such a social-environmental system. The lagoon of Venice is a Special Protection Area (IT3250046) and it includes the Special Conservation Zones "Northern Lagoon of Venice" IT3250031 and "Central-Southern Lagoon of Venice" IT3250030 under the Birds and Habitat Directives. The "City of Venice and its lagoon" is a UNESCO World Heritage site, the lagoon is also very important for bird species and it includes the Ramsar Site of Valle Averto.

Challenges

The area is subject to several natural and anthropogenic pressures. A major challenge is represented by finding the appropriate balance between different strategies pursuing multiple objectives such as flood defence, ecological and morphological equilibrium, and socio-economic sustainability.

Sea level rise and subsidence (caused by both natural phenomena - compaction of alluvial plain's soils - and anthropogenic pressure i.e. water extraction from artesian wells in the industrial area mainly during the first half of past century until late '60s) determined an urgent need for implementing actions of flood defence.

Morphological disequilibrium of the lagoon is represented by a loss of sediment (about 610.000 m3/year, model estimates) able to feed, maintain and accrete saltmarshes. This results in a net export of sediments to the Adriatic Sea of approximately 240.000 m3/year (Marani, 2022). The continuous loss of sediments has a significant impact on ecology and biodiversity. Again, multiple (natural and anthropogenic) factors are driving morphological disequilibrium, mainly: reduction of river's input, structural features of the inlets, wave motion and bottom shear stress. The last two factors are caused by water traffic (incl. recreational boating), cruise ships and shipping as well as by the action of the wind, whose impact increases with the reduction of wetland morphologies able to limit the fetch. The large navigation channel leading to the industrial area determines a suction effect on the bottom sediments of adjacent shallows, thus exacerbating the erosion and flattening of the central-southern part of the lagoon.

After the algae blooms and consequent anoxia phenomena of late '80s, the system experienced a substantial recovery (Mazzoldi & Sfriso, 2022) mainly due to the great efforts in abating nutrient loads both from the drainage basin and from the industrial zone. Sporadic crises still occur in limited areas close to the road and railway bridge connecting Venice with the mainland that suffers from scarce water circulation and stagnation. This is mainly due to accumulation of sediment and bivalves

concretions beneath the bridge arches (at present the maintenance and unblocking of the arches is slowly proceeding).

Similarly, the serious concern for chemical pollution, emerged during late '90s, strongly decreased thanks to both an enormous work of confinement of the banks of the industrial area (avoiding the transfer of pollutants from contaminated soils and aquifer to the lagoon along about 40 km of industrial channels) and to the progressive abandonment of industrial production, especially of petrochemical plants connected to the chlorine cycle of production. During the year 2013 the national government modified the perimeter of Porto Marghera National Contaminated Site excluding all the water bodies and maintaining only land areas (most of which are still awaiting to be cleaned up). Actual concern for chemical pollution remains with respect to the presence of emerging contaminants (such as Polibromodiphenylethers, ubiquitous flame retardants, and Perfluorooctane sulfonic acid and its derivatives, following a dramatic contamination of the aquifer in the neighbouring provinces of Vicenza, Verona and Padua).

Facing such critical issues is still more complicated considering the need to maintain social and economic activities in lagoon islands and in the mainland. From a wetland conservation point of view, water traffic connected to port activity and tourism related mobility is one of the main threats. Fish farms and traditional fishing is an economic sector which is strictly intertwined with the fate of wetlands.

Climate change and connected phenomena, especially sea level rise, open other fundamental and new perspectives in thinking about the future of Venice and its lagoon, including the possibility to keep on hosting such an important port. In fact, the occurrence of pessimistic sea level rise projections by 2100 could determine the need to close the MOSE gates for more than ten months a year (Lionello et al., 2021).

Implemented restoration measures

The dramatic flooding event that occurred in 1966 represented a turning point in Venice's (and its lagoon) history. After that event the national government stated that "the safeguard of Venice and its lagoon is a matter of national interest" (Law 171/1973) and put in place a series of Special Laws specifically dedicated to the subject. The Special environmental legislation for Venice often preceded the national one, so that studies and experimentations in the lagoon were always at the state of the art. Some general items may be very roughly identified and can be traced back to the relevant authority: hydraulic management, ecologic and morphologic restoration and flood defence (national government), water management, wastewater treatment plants and pollution abatement (regional government), incentives for urban centres liveability and productive system as well as funds for urban infrastructures and buildings' maintenance (Venice and Chioggia Municipalities).

As for the wetlands in the lagoon, the main interventions have focused on salt marshes and habitat reconstruction: during the period from early nineties to present time approximately 16 km2 were reconstructed and naturalized. The littoral stripe separating the lagoon from the Adriatic Sea was reinforced through 60 km beach nourishment and coastal dune restoration. Other measures involved phytoremediation (constructed wetlands), seagrasses transplantation, protection of salt marshes borders with small scale bioengineering techniques, diversion of fresh water flows into the lagoon and reed transplantation where needed to restore intertidal morphology, to reduce erosion and to favour biodiversity recovery.

The entry into operation of the mobile gates system of defence from flooding (the MOSE system) represents a measure that changes the boundary conditions of the lagoon. The magnitude of its effects on the ecological state of the lagoon will depend on which scenario of sea level rise induced by the climatic change will occur. For this reason, the lagoon system is being continuously monitored and studied in all its components.

Restoration activities were carried out with national funds (within the General Plan of the Interventions under the Special Legislation of Venice and within the Plan of Compensation Measures related to the construction of the MOSE system). Positive experiences of restoration were also achieved within different EU funded Life Projects (Life Refresh, 2017-2022; Life Seresto, 2014-2018; Life Vimine, 2013-2017).

Main actors, roles and mutual relationship

The institution in charge of the physical and environmental safeguard is the “Provveditorato Interregionale alle Opere Pubbliche del Veneto, Trentino Alto Adige e Friuli Venezia Giulia (former Magistrato alle Acque – Venice Water Authority)” which is a local branch of the national government under the Ministry of Infrastructures and Transports. Public works (including the MOSE System) under the jurisdiction of Provveditorato are executed by a private consortium of enterprises (Consorzio Venezia Nuova).

Relevant competencies pertain to the Veneto Region (especially regarding pollution abatement from the drainage basin and Natura 2000 sites management) and the Municipalities of Venice and Chioggia.

The Port Authority is involved especially in relation to the activities of dredging channels in the port and industrial areas.

The Metropolitan city of Venice (whose jurisdiction spans in the Venice province area) has competences mainly on local mobility transport service and on restoration and conservation of historical, cultural and urban heritage (including public buildings, schools etc.) with limited influence on wetland conservation issues.

The main national Environmental Law (D.lgs 152/2006) transposing the EU Water Framework Directive brought to the establishment of Water District Authorities (emanations of the Ministry of Environment). The Venice Lagoon falls into the Eastern Alps District that encompasses 13 river basins stretching over three regions and two autonomous provinces and two water boards i.e. the Alto Adriatico and the Adige. Nevertheless, according to the Special Law for Venice, the Provveditorato (at that time called Magistrato alle Acque - Venice Water Authority) competences over the lagoon remained unchanged.

Due to the co-existence of multiple uses of the lagoon (mainly fisheries, aquaculture, tourism, commercial and industrial transport), restoration activities are influenced by multiple interests, represented by a wide number of stakeholders.

Decision making process

The number of institutions involved in the governance of the system is quite high and this makes the decision making process quite difficult. Some commissions were set up in order to coordinate the process: in particular the “Safeguard Commission” (Law 171/1973) expresses binding opinions on all building interventions as well as transformation of the territory for the realization of both private and public works and include 22 members from Veneto Region, Provveditorato, Ministries of Infrastructures and Transports, Environment, Cultural Heritage, Agriculture and Forestry, National Research Council, Venice Municipality and Venice Metropolitan Area, other municipalities bordering the lagoon, UNESCO, Local Health Agency, Firefighters. A special Committee (so-called “Comitatone”, Law 798/1984) performs programming and addressing functions and includes the State Prime Minister, members from Ministries of Infrastructures and Transports, Economy, Environment, Cultural Heritage, University and Research, Veneto Region, Venice Municipality and Venice Metropolitan Area, Chioggia and Cavallino-Treporti municipalities, two representatives from other municipalities bordering the lagoon.

Some important strategic plans and projects were implemented under specific Memorandum of Understanding documents (or other joint actions) between governing authorities.

UNESCO may exert a significant pressure in prompting government actions: in 2015 it warned that Venice might be included in the list of UNESCO “World Heritage Sites in Danger” if the Italian government had not banned large cruise ships from the city’s lagoon and created a sustainable tourism strategy.

In 2020, in order to try and simplify the decision making process, the national government decided to set up the “Authority for the Lagoon of Venice” which is intended as a unique subject able to assume all competences presently distributed among too many different actors. Such an institution is still waiting to become operational due to both political elections and recent modifications in the composition of the advisory board aimed at giving more power to local institutions.

Public participation and social engagement were historically quite limited, resulting in an undoubtedly confrontational rather than cooperative context. Some limited experiences may be cited such as the Agenda 2021, the Wetland Contract of the Northern Lagoon and the débat public discussing solutions for the integration of the MOSE system in the surrounding lagoon landscape and environment. The Wetland Contract of the Northern Lagoon of Venice was conceived in the framework of the Interreg Italy/Croatia CREW Project. The Contract includes 18 actions and 76 activities. The process for the construction of the contract started in September 2019 with a series of information meetings in the main municipalities of the area involved (Musile di Piave, Venice, Quarto d'Altino, Jesolo, Cavallino-Treporti). The work continued with listening activities, public participation and negotiation, including two tours for the formulation of the knowledge framework and the organisation of three working tables dedicated to: (i) ecological and hydromorphological protection and wave management; (ii) productive and recreational activities, agriculture, hunting and fishing, tourism promotion and reception, and (iii) housing and accessibility. The process was characterised by a wide participation of institutional and non-institutional actors. However, some key actors such as the Venice Municipality did not participate, posing the issue of a broad and balanced stakeholder representation. The governance dynamics inherent in the environmental contract should therefore be pursued in the future to ensure effective management of wetlands. To date, CREW activities have been focused on promotion of initiatives by individual signatories rather than coordinated actions to improve territorial governance.

Strategic and planning instruments

Main strategic and planning documents reflect the presence of different institutions deputed to govern the territory.

The General Plan of the interventions, approved in the late '80s by the "Comitatone" under the Venetian Special Legislation, follows the main objectives of flood defence, morphological re-equilibrium and inversion of the habitat degradation trend. A specific Morphological Plan for the Lagoon is supposed to outline a programme of interventions aimed at protecting the lagoon's environment by counteracting erosion and the burial of canals, impoverishment of flora and fauna and the loss of structural habitats while pursuing a balance with the needs related to port activities. This Plan is to be approved by the national government and is undergoing continuous revisions due to (i) changing boundary conditions (e.g. increased pressure determined by cruise ships), (ii) lack of consensus (originating comments and observations mainly from NGOs and the general public), (iii) uncertainty on possible uses of dredged sediments.

The Plan for the Lagoon and the Venetian Area (PALAV) - approved in 1995 by the Veneto Region - is the main urban planning instrument ruling the possible uses of different lagoon areas. PALAV is integrated by the Master Plan (Piano Direttore 2000) of the Veneto Region ruling in particular the reduction of pollution in the drainage basin.

After the construction of the MOSE system, the mobile barriers built to protect Venice from flooding, a Plan of Compensation Measures to restore the impacted Natura 2000 sites was elaborated under the Habitat Directive and at present time this is the main document addressing restoration projects. Moreover Conservation Measures for Special Conservation Zones (under the Habitat Directive) were approved by the Veneto region in 2016, to limit and ban certain activities, works and interventions that are potentially dangerous for the conservation of biodiversity.

The "Eastern Alps" River Basin Management Plan and Flood Risk Management Plan represent the institutional documents at the district level elaborated under the Water Framework Directive 2000/60 and Flood Directive 2007/60 with the coordination of Eastern Alps Water District Authority.

At the national level, the National Biodiversity Strategy constitutes the general reference framework for the implementation of policies for the protection of biological diversity in application of the Convention on Biological Diversity (CBD) and European and national legislation. In particular, it contains two areas for the protection of wetlands (Inland Waters and Marine Environment).

Lessons learnt

Success and Limiting factors

The very high complexity of the socio-ecosystem of the Lagoon of Venice is the main factor that must be taken into account. The current state of the site is the result of sixteen centuries of coevolution between man and nature, a continuous balancing of anthropogenic pressures and natural forces in a highly dynamic system, being located between the sea and the land. Conflicting issues continuously arise, given the need to preserve the beauty of nature and of the ancient city and at the same time giving the possibility for people to move (transport) and to settle economic activities (fisheries, tourism, industry and other services).

Controversial opinions about the success of restoration actions actually exist between different stakeholders. According to We Are Here Venice (WaterLAND Project partner, an organisation that promotes strategic and participatory approaches for the safeguarding of the city and its lagoon), the restoration works undertaken have not explicitly addressed the root-causes of degradation which is the impact of tourism, shipping (including large cruise ships) and local water transport on the lagoon and the baseline sediment deficit of the whole system.

The Special Legislation for Venice guaranteed a very important source of funding which allowed to achieve several objectives (both in terms of research and in terms of implemented projects) but on the other hand had some negative effects. In fact the Special Law assigned to a unique concessionaire (Consorzio Venezia Nuova) the task to design and execute most of restoration projects which made it possible for the rapid execution of projects. However, this system revealed lack of transparency which resulted in a consequent limited participation and involvement of the general public, finally causing quite a confrontational context. Moreover, in the occurrence of public participation events,

environmental NGOs represented the great majority of actors, and even though they surely made useful contributions, this resulted in a limited spectrum of perspectives to be discussed.

Notwithstanding the fact that the system may be considered as monocentric due to dominant role played by the national government (represented by Provveditorato as main funder of restoration and defence projects), the presence of several administrative bodies governing multiple aspects of the system (as depicted in the scheme) sometimes led to stalemate, but most of all made it very difficult the planning and programming steps in governing the territory.

Venice and its lagoon are considered something really “unique”. The need to ensure exceptional protection is reflected in a system of special rules (under the Special Legislation for Venice) that apply only to the Venice lagoon and transcend the national legislation. At the same time, the need to comply with common and shared environmental objectives and procedures, established at the European level, poses new challenges but also new opportunities. In this regard, key EU Directives (the Water Framework Directive, the Flood Directive and the Natura 2000 directives) provide a framework able to bring all actors on the same ground and to promote participative processes.

Recent experiences (LIFE projects, Agenda 2021, Wetland contract, debat public) involving serious attempts at strengthening stakeholders engagement and citizen awareness, taking advantage of local knowledge and workforce - geared towards carrying out small-scale interventions – were quite successful.

The safeguard of ecosystem services approach could be a perspective able to put together different goals and related drivers in a sustainable framework, notwithstanding the fact that - apparently - some research is still needed to go beyond the field of research and establish operational indicators and procedures that might be adopted at the management level.

Replication

The recent successful LIFE projects mentioned above (“Refresh”, “Seresto”, “Vimine” - involving different institutions, stakeholders and citizens) and the signing of specific Memorandum of Understanding between different actors can create the conditions for new and more comprehensive agreements supporting the ecological restoration, exploring for example the opportunities offered by the wetland contracts.

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Belene Island, Bulgaria, a local restoration project in the Danube transnational area

Description

The Belene island complex is formed by the main island (Belene) and nine smaller islands, characterised by freshwater marshes, seasonally-flooded riverine forests, and agricultural and semi-natural land cut by drainage channels. The island, close to the border with Romania, is formed by the Danube River that splits into two branches passing north and south of it.

The Belene Island complex is a Ramsar site (covering 11432 ha). Moreover, together with the Suhaia Ramsar Site in Romania, it is part of the "Suhaia - Belene Islands Complex" a transboundary Ramsar Site established in April 2013.

Belene is included in the Persina Nature Park (established in 2000) that spans across 21762 hectares along the Bulgarian river valley of the Danube River. The park aims to conserve and restore the Danube wetlands while conserving the various river islands. Moreover Persina is part of the Natura 2000 network, following both the EU Habitat and Bird Directives, as well as of the DANUBEPARKS association, a network of Danubian protected areas founded in 2014.

The site is exceptionally relevant for biodiversity, hosting rare species of plants and as habitat for mammals, birds, amphibians and fish. Moreover, Belene plays an important role in flood mitigation and sediment trapping.

Challenges

In the 1950's, the island was surrounded by dikes and was crossed by several draining channels built to keep most of the area dry. The wetlands were fed by underground waters only (and no longer by the Danube river), so that some of them occasionally got dry and converted to temporary waters. After more than 50 years, the dikes were finally reopened and the Danube flooded the island again, recreating wetlands that are home to hundreds of rare birds. The water exchange between the Danube and the Island is currently regulated through three man-controlled gates. However, the alteration of the Danube River for navigation purposes progressively led to the erosion of its bed. Consequently, the wetlands are currently located in an area 1-2 metres higher than the river bed itself. This would cause a natural fast outflow of water from the wetland, if gates are not closed in time to keep the water inside.

Belene Island was used in the past as a concentration camp for the political opponents of the communist dictatorship. The Belene Prison is still operating as a penitentiary in the western part of the island. Other human activities include agriculture, farming and small-scale timber harvesting.

Invasive plant species are also identified as a threat to wetland habitats. Abundant wild boar populations inhabit the island, and also play a role in degradation.

Today, there are plans from the European Commission to improve navigation on this part of the Danube river by doing major construction works, including dredging, damming and straightening the river course. This would negatively impact the wetlands and associated biodiversity which is why WaterLANDS partners in Bulgaria are working to protect this network of protected areas and to demonstrate the importance of preserving the natural features of the Danube in this region.

Implemented restoration measures

Restoration of wetlands of Belene Island is focused on protecting, sustaining and developing biodiversity of this important part of the natural park. The ecological functions of the area are being progressively restored after a fifty-year period of permanent isolation of wetlands from the Danube River (ca 1950-2000).

The first restoration efforts on the island took place from 2002 to 2008, with a total area of 22 km². They mainly focused on reconnecting the Island's wetlands with the Danube, which had been artificially interrupted in the 1950s.

The main sources of funding consisted in the "Wetland Restoration and Pollution Reduction Project" by the Global Environment Facility (GEF) World Bank and the Bulgarian Ministry of Environment and Waters. The GEF project contributed to the achievement of the goals set by the Lower Danube Green Corridor Agreement, an international treaty between the governments of Bulgaria, Romania, Ukraine and Moldova. The Lower Danube Green Corridor aims at making the Lower Danube a "living river" connected to its natural flooding areas and wetlands.

A monitoring system was developed by the Persina Nature Park Administration, but it is currently underfunded. Notwithstanding, local communities and stakeholders consider these efforts to have been successful, with positive results in terms of increased territorial resilience for the island's ecosystems and communities.

Large-scale wetland restoration projects have been successfully completed and a visitor's centre has been built.

There are plans to implement new restoration actions and to improve and automatize the current system of water flow regulation and water exchange with the Danube River. There are significant delays due to governmental instability and the conflict in Ukraine which has led to logistical issues mainly due to unavailability of machinery such as reed cutters. The planned restoration actions are mainly linked to reed management, cutting reeds in the wetlands to create better habitats for some bird species and improving water flow, while improving the operation of the gates.

Main actors, roles and mutual relationship

The Ministry of the Environment and Water in Bulgaria was responsible for the restoration project that ran from 2002 to 2008.

The main stakeholders involved in the restoration project were the Municipality of Belene, the Prison Administration (one of the major landowners of the island) and the local hunters' association exerting significant political influence at the national level. Initially, these stakeholders had a relevant role in the approval of the first restoration plan, being progressively less involved.

The Persina Nature Park Administration is responsible for the environmental monitoring programme.

NGOs (like WWF) have taken responsibility for the Lower Danube Green Corridor initiative working closely with the governments of the countries - Bulgaria, Romania, Moldova and Ukraine - that signed the Agreement, as well as local stakeholders.

Decision making process

A project committee was established in the first year of implementation of the restoration project. Initially it was quite formal, but it slowly became an unofficial but professional support network, especially when important decisions had to be taken.

Initial conflicts with the agricultural use were solved through a dedicated agreement between the Prison Administration (who owned part of the land previously used as agricultural land) and the Ministry of the Environment. The agricultural land was allocated to the Ministry of the Environment for restoration purposes. Other initial conflicts with hunters were also encountered, but then solved. Indeed, hunters have a role in containing the booming wild boar population that is threatening the local biodiversity.

The design of restoration measures was done in cooperation with international experts of the World Bank. Different stakeholders like the Prison Administration, local authorities, NGOs (WWF) and the local population were involved. The project was finally approved by the Ministry of the Environment. NGOs.

Strategic and planning instruments

No official strategies and plans for new restoration actions are currently in place. However, the administrations are looking for new funds to continue restoration and improve the connection with the river and to maintain the conservation status of the wetland

Lessons learnt

Success and Limiting factors

The international dimension of restoration is a key distinctive feature of this wetland. Indeed, an overarching vision for the entire lower Danube river stretch was set up before the restoration started. The international agreement for the lower Danube Green Corridor set up ambitious objectives for the

whole area that the GEF fund contributed to achieve locally in the Belene Wetland. The involvement of international experts from the World Bank was also decisive since they brought their knowledge and contributed to an effective design of restoration measures.

Conversely, the current international unstable political situation is seen as a threat for a long term conservation of Belene wetlands. The dependence on the availability of funding for restoration and conservation coming from the national governance is hindering the implementation of new projects.

The support from EU environmental policies (the Water Framework Directive in particular) has been generally low so far, though its potential role for the future is very relevant. Indeed, the implementation of WFD at the national level is still poor and the preparation of the River Basin Management Plan is a lengthy process.

The restoration project encountered scepticism, especially from the elderly, due to a general lack of understanding of the benefits coming from the removal of the dykes which had separated the wetland from the Danube river. Wetlands were mainly associated with malaria and mosquitoes, so that they were mainly associated with negative feelings. This demonstrated the need to set aside more resources to explain the project rationale and to engage people in educational and awareness-raising activities.

The establishment of the Visitors Centre by the Park Administration was an important step in this direction, enhancing the sense of ownership by the local people, encouraging ecotourism and appreciation for wildlife.

Another threat is coming from climate change. Though restoration works have increased the overall resilience of the area to flood impacts, the drought experienced in 2022 was particularly severe, with extremely low water levels in the Danube river, drying of the surrounding wetlands and disappearance of birds that abandoned their nests.

Replication

Replication or upscaling of the restoration project is hindered by the lack of funds and by the unstable political situation that does not create the enabling conditions for prioritising environmental actions.

The Water Framework Directive and the Floods Directive could be very relevant for new restoration activities, but their implementation at the national level is quite poor, with delay in the preparation of the requested management plans.

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Wetlands around Warsaw – Kampinos Wetlands, a restoration programme driven by EU funded LIFE projects

Description

The Kampinos wetlands are part of the Kampinos National Park (KNP) territory. Kampinos National Park was established in 1959. It is located in the Central Masovian Lowland, between the left bank of the Vistula and the Bzura, just off the north-western peripheries of Warsaw. The area of the park is 38,544.33 ha. The main features of the landscape are vast wetlands (mainly fen peatlands) being an old river bed and between them big areas of forested inland dunes, both created in Late Pleistocene. In wetland areas, the main habitats are alder and alluvial forests, reedbeds and wet hay meadows. On slightly elevated ground oak-hornbeem forests and fresh meadows have evolved. Since 2004, the Kampinos National Park has been a Natura 2000 site (PLC 140001), both due to the richness of bird species and the diversity of plant communities. Thanks to its natural values and social importance, in 2000 the Kampinoski National Park, together with the buffer zone, was recognized by UNESCO as a World Biosphere Reserve under the name "Puszcza Kampinoska".

The park is an important area for recreational and leisure activities, especially for Warsaw's citizens, with hiking and bicycle trails.

Challenges

The site was heavily affected by drainage works (Vistula and Bzura rivers embankments, construction of drainage channels and ditches) from the 1840s to the 1970s. Drainage works have caused the groundwater level to fall down by about half a metre. Water from the spring backwaters, instead of stagnating in swamps, used to flow out quickly from the forest. Consequently, the most vulnerable species of plants and animals started to disappear from the area. Due to restoration activities, performed within two EU-funded projects, the site is progressively recovering.

Implemented restoration measures

Since the beginning of 1970's the Park has taken measures to restore water resources, like reintroduction of beavers (1980s), building earthwork dams on the small drainage ditches using farm methods (1990s), land purchase programme (continuous action started in 1970's). The first restoration effort in the Kampinos area started in 2008 with a pilot study in a small area to improve

the hydrological conditions. First restoration activities were carried out within the Life project "Conservation and upgrading of habitats for rare butterflies of wet, semi-natural meadows (2006-2010).

More restoration activities have been implemented through the LIFE project Kampinos Wetlands (2013-2019) and the ongoing Kampinos WetLIFE (2020-2026). Both projects are a response to the progressive lowering of the water levels in the KNP. The project activities are aimed at slowing down the outflow of water and at keeping water in wetlands during periods of drought, while preventing flooding of the surrounding private areas (both farmland and built up areas). The objectives are being achieved through the construction of various types of small hydraulic structures (earthen/wooden dams in the ditches, culverts with tidal flap valves, reinforcement of dikes to favour water retaining and avoid flooding of private lands, reshaping the channel banks). The Kampinos WetLIFE project, relying on the success of the previous project, aims to further restore and increase the ecological resilience of 6141,5 ha of Natura 2000 habitats located in the Kampinos National Park. The main measures in this project will focus on decreasing outflow in the primary ditches during middle and low water level, and naturalisation of their beds. Increasing surface water level and decreasing outflow in those primary ditches is crucial for preserving proper water conditions in the Kampinos wetlands, but because of private land ownership it couldn't be performed earlier. The project also aims to limit conflicts between the interests of nature conservation and local communities.

Both projects depend on the possibility of purchasing areas for restoration from private owners. 145 ha of private area (previously parcelled in 167 sites and owned by private actors) were purchased by the National Park within the Kampinos Wetlands project, while new areas (80 ha) are planned to be acquired within the Kampinos WetLIFE project (ongoing project). These areas are frequently flooded and are not suitable for intensive agriculture.

Currently, the Park already has extensive areas of its property, which makes it possible to undertake restoration activities. Independently, the process of land purchase continues, as it is the most effective way to implement comprehensive restoration and protection activities of any water-dependent natural habitats.

Main actors, roles and mutual relationship

Many different categories of stakeholders play a role in the overall management of Kampinos wetlands.

The main actor is the Kampinos National Park. This name both refers to the area designated for nature protection (covered by wetlands for about 40%), and the public organisation which governs this area. Most of the area of the Kampinoski National Park belongs to the State Treasury and is governed by the Park administration. The remaining area is private land, split in several parcels. This makes governance of ecological restoration challenging.

Kampinos National Park's partners in LIFE projects closely cooperating on a daily basis are REC Poland, Warsaw University of Life Sciences, Mazowieckie Voivodeship Self-government.

REC Poland (Regional Environmental Centre) is an NGO that supports sustainable development in Poland and that has been carrying out environmental protection activities in Poland since 1992. REC Poland is the coordinator (together with the Kampinoski National Park itself) of Kampinos Wetlands Project and Kampinos WetLIFE project.

Warsaw University of Life Sciences – established in 1816, carries out multifaceted scientific activities oriented toward solving current problems of the national economy especially in the field of environmental problems. The Kampinos wetlands projects are carried out at the Institutes of Environmental Engineering and Animal Science, which conduct scientific and didactic activities in the fields of environmental engineering and protection, as well as animal protection and bioengineering. Scientists from the University are responsible for project monitoring as well as enforcement of populations of endangered species of snails and amphibians.

Mazowieckie Voivodeship's Self-government was created on January 1st, 1999. The tasks assigned to the Marshal and the Management Board and realised by the Office of the Voivodeship are especially tasks connected with public education, healthcare, environmental protection and modernization of rural areas, water management, culture and protection of culture heritage, road construction and transport, sport and tourism. Moreover, voivodeship's self-government carries out tasks concerning the promotion of the Voivodeship and foreign cooperation, regional development and internal audit, and since 2004, tasks concerning the absorption of European funds. In the Kampinos wetlands, LIFE projects self-government is responsible for upscaling activities to the whole region.

Other partners of the Park, both in day-to-day work and in agreeing on local action plans and procedures, are regional and government offices (Ministry of Climate and Environment, Regional Directorate of Environmental Protection and State Water Holding Polish Waters), as well as local governments (Marshal's Office, 3 counties and 8 municipalities). The Regional Directorate for Environmental Protection in Warsaw, established in 2008, carries out tasks in the field of assessing the environmental impact of the implementation of planned strategic documents, such as land use plans or strategies and programs in the fields of water management and forestry, among others. Participates in the procedures of strategic environmental impact assessments and agreeing on draft resolutions and decisions in the part concerning Natura 2000 areas, in terms of the impact of the findings of the analysed document on their protection.

The State Water Holding Polish Waters (Polish Waters) is the main entity responsible for water management in Poland, established in 2018. Its establishment combined dispersed competences in the field of water resources management. It collaborates with Kampinos National Park to co-manage watercourses in the site.

Local authorities - The Park area is situated in the Masovia region (Voivodeship, województwo) that includes 3 counties/ districts (powiaty) and 8 local municipalities/communities (gminy). They approve yearly plans of conservation activities in the Park area, and the Park approves spatial development studies and plans provided by local authorities concerning the area of the Park and its buffer zone. Local authorities issue construction permits for both Park's and private owners investments.

Private owners – 10 % of the land within the borders of the Kampinos National Park belongs to the private owners. Private parcels are usually small (about 1 ha or less), in the shape similar to elongated rectangles, situated across natural relief. On some of those parcels there are houses and other buildings. Some of the owners are still active farmers whilst most of them already abandoned farming because either of their age or working in the surrounding towns or Warsaw. Their awareness of the need for nature protection is diverse. Some of them are willing to sell their parcels to the National Park for nature protection, others are not willing to sell, but they understand the need for nature protection and have nothing against the increase of land irrigation. Those who actively cultivate their land situated on marshes like to see much lower ground and surface water level than is needed for wetlands' nature. There is also the group of owners, who see the future of their land changing into housing/development areas, since the prices of development parcels close to Warsaw are getting higher and higher. This last attitude is especially dangerous for nature protection and conservation of wetlands and Park administration put the highest effort to buy up land of those owners (as they put a lot of pressure on local authorities to change vast areas from farming or nature protection activities into residential/housing areas).

Decision making process

The decision making process started in the middle of 1970 when it became clear that the process of building the drainage system in the Kampinos wetland (which had been going on for more than a century) had led to soil depletion, peat mucking, overdrying of the meadows, lowering of the ground and surface water level and decrease amount of water dependent species and habitats. At that time two crucial decisions for nature protection in the Park area were made by the Polish government: 1) building drainage system was halted, 2) buying up private lands by the state for nature protection was introduced. Following few minor projects, the full scale research project was conducted in 2008-2011: Development of method for reconstruction of primary hydrological conditions in Kampinos National Park in order to restrain nature degradation and improve biodiversity status supported by a grant from Iceland, Lichteinstein and Norway through the EEA Finance Mechanism and the Norwegian Financial Mechanism. In the project several issues were studied: the hydrological and hydrogeological aspects, soils, plant habitats and species, and the social and economic situation. The main outcome of that project was a list and the map of proposed technical and non-technical activities which should be undertaken to improve the state of nature and enhance water conditions on the wetlands.

This research became a foundation to include the need of augmentation of water retention and increasing of ground and surface water level for nature conservation in strategic plans and goals for the Kampinos National Park. The outcome of this "Norwegian" project provided a basis to formulate LIFE projects proposals.

Proposals for both LIFE Kampinos wetlands projects included chosen activities from those listed in the "Norwegian" research project – those which would not conflict with private owners. Proposals obtained support from local authorities, nature protection authorities, Polish Waters, scientists and other stakeholders.

Once funding was obtained, action started from the preparation of detailed conception of measures, which was widely discussed and approved. Arrangements with residents/landowners and local governments were made. The administrative decisions were obtained from Polish Waters, Regional Directorate for Environmental Protection in Warsaw, local governments. Where needed, building plans were elaborated. Simultaneously, all activities were consulted with the Scientific Board of KNP (advisory board) and a proficient dialogue with citizens (being private landowners within the Park borders) was performed. Indeed, more than 2 thousand people living in the Park were involved. This is considered as one the most important aspects of the projects. In the same time continuous hydrological monitoring started and monitoring of "zero state" of species, habitats and social situation was conducted. When all measures were constructed the next administrative decisions allowing for operation were obtained and final stages of monitoring were performed.

Additionally, a tripartite agreement between the Kampinos National Park, Polish Waters and local governments was signed. The agreement was related to principles of cooperation between those three parties and operation schedules of weirs situated on main ditches in the Park.

The other interesting exercise was elaborating on a 100 years vision of the Park and the buffer zone area. Scientists representing various disciplines (hydrologists, hydrogeologists, botanists, zoologists, social sciences representatives) took part in this exercise, as well as the Kampinos National Park employees. The aim was to imagine the perfect status of nature protection in the very long term which should be a goal to endeavour to. The vision does not include the possible catastrophic events and only vaguely takes into consideration mitigation and adaptation to climate change. This elaboration needs further discussions and agreements with local partners and with the general public.

On the basis of experiences gathered during the first LIFE Kampinos wetlands project, a second project was elaborated. Procedures of decision making were similar. Presently the detailed conception of measures is finalised and the wide consultation with stakeholders are being provided.

Strategic and planning instruments

In 2021, at the request of the General Directorate for Environmental Protection, a draft Strategy for the protection of wetlands in Poland for the years 2022-2032 was developed. Three main objectives

of the Strategy have been adopted: (1) Improvement of peatland biodiversity and reduction of greenhouse gas emissions from peatlands by 30%; (2) Improving the state of biodiversity and supporting natural processes in aquatic ecosystems and increasing water retention in riverside areas, and (3) Maintaining and strengthening the protection of wetlands within the network of Ramsar sites in Poland. In 2022, the draft Strategy is subject to internal and external consultations conducted by the Ministry of Climate and Environment.

Within the public consultation of the second revision of river basin water management plans in Poland (according to the EU Water Framework Directive), the Park made concrete proposals for the implementation of restoration measures. The proposals made by Park were included in the programme of measures in the official document. These provisions will formally facilitate the implementation of restoration concepts within the framework of the implemented actual projects.

Since 2010, the Park functions on the basis of yearly Conservation Tasks being an Order of the minister responsible for nature conservation (i.e. presently Ministry of Climate and Environment). The Conservation Tasks are prepared on the basis of legislation acts (as Nature Conservation Act), strategies (like the Forest management plan for the K NP) etc.

Presently the Park is elaborating new projects for a Plan of nature protection (for the coming 20 years), which will include protection tasks for Natura 2000 site, including all water-dependent habitats.

Lesson learnt

Success and limiting factors

The experience in LIFE restoration projects showed that an early involvement of citizens in the scheduled activities is extremely important. Local people were initially sceptical towards the project, but after their involvement in dissemination activities, a more supportive and collaborative environment was established.

The land ownership (a mix of private and public owners) is complicating the overall governance of wetlands for successful restoration. Funding is another limiting factor, since no state funds are available. New opportunities can arise from the EU LIFE Programme for which Poland has received a large amount of resources in 2022.

In order to achieve the project's goals without stirring up social conflicts (related to the fear of “swamping/flooding” of private landowners), the Park administration must not set overly ambitious short-term goals. Activities must be balanced and long-term, implemented step by step.

It is also difficult to talk about the possibility of restoring the condition of natural habitats to their original conditions. It should be remembered that Kampinos National Park is located in the Vistula river valley, from which it has been irrevocably cut off by the construction of dikes, and the former Vistula valley (in the foreground of the Park, located outside the borders of Kampinos National Park) has been intensively and tightly built up, as these areas are also suburbs of Warsaw. This fact has a

major impact on the condition of natural habitats. Currently, the main source of water supply to the National Park is precipitation, and only a small part of it flows into the park from outside. In the past, periodic floods, from which the Park was cut off by the construction of dikes, were of great importance for water resources. Most of the water (i.e., more than 80%) evaporates, the remainder drains through canals or seeps underground.

In this context, it is difficult to define what is a success and what is a limiting factor for activities. On the one hand, actions on canals to slow down runoff affect a very small part of the Park's water balance. On the other hand, the implemented wetland hydration projects undoubtedly improve the condition of wetlands, and partially initiate their natural restoration processes as well. It should be remembered, however, that a complete reverse of the degradation processes that have taken place in the area is, unfortunately, impossible. This also complicates the possibility of assessing the effectiveness of the activities carried out in the sense of restoring the condition of natural habitats in their original state.

Replication

The restoration success of the first project (Kampinos wetlands) has boosted the implementation of the second project (Kampinos WetLIFE). A number of workshops and meetings are planned within this second project that are expected to generate other regional and international initiatives for wetland protection. This will lead to multiplication of project's results, as well as contribute to the engagement of other sources of financing for nature conservation.

The Park initiates and supports restoration activities in its immediate surroundings, i.e. the park's buffer zone and 8 municipalities, and works to replicate such activities at the regional level (i.e. the Mazovian province). The challenge and (medium-term) goal for the Park is to get other entities (e.g. local governments in the region, and not just nature institutions and organisations) involved in nature and climate protection activities.

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Wetlands around Warsaw – Całowanie: a fragmented ownership that makes the governance of restoration challenging

Description

The Calowanie Fen, covering an area of 30 km2, is one of the largest peatlands in Central Poland. It is located to the south-east of Warsaw (around 40 km away) and lies almost entirely within the limits of the Masovian Landscape Park (MLP). It lies within the administrative borders of 4 municipalities: Karczew, Celestynów, Osieck and Sobienie Jeziory.

Peat deposits are 2- 6 m deep, depending on subsurface geomorphology. Impermeable layers of the upland enabled the formation of underground water reservoirs that provide sub-artesian water, flowing upwards and feeding the fen system from the bottom. The Calowanie Fen used to host a number of rare and protected species of birds, butterflies and plants protected by the European nature directives, which qualified the peatland as a Natura 2000 site.

Challenges

The Calowanie Fen has been modified by human activities for centuries. Before the 20th century, the site was used as hay-meadows with limited fertilisation and grazing at the margins of the site. Small-scale peat extraction also used to be a common practice.

During the last century the site experienced the most profound large-scale impacts, due to the regulation of the Jagodzianka River which is a tributary of the Vistula River and the construction of an intensive drainage network. In the 1930s, the waters of its upper reaches were diverted straight into the Vistula River through the Warszawicki Canal. Drainage works carried out in this area since the 1950s caused a rapid drop of the groundwater level. Many drainage ditches were constructed between 1960 and 1980 and this resulted in a major transformation of the system. In the 1990s, socio-economic changes and the progressive degradation of the peat soils led to the gradual withdrawal of agriculture from the peatland. Commercial peat extraction was also carried out at margins of the peatland, but it had a limited impact on the whole system until 1998, when illegal peat extraction started in the central part of the fen, significantly accelerating outflow of groundwater due to connection of the mining site to a major drainage canal. The activity was carried out under the pretext of building fishponds and lasted until 2007. Since then, turf-pits of approximately 10 ha function as fish ponds connected to the drainage network, continuously abstracting groundwater level from sands underlying the fen. External sources of groundwater abstraction are also involved, such as large-scale horticulture, industry and drinking water supply.

The conservation values of the site significantly decreased from the 1990s and the majority of the peatland is severely degraded now.

Implemented restoration measures

In 2004 a conservation and restoration project was started to maintain the valuable habitats of fen meadows and to stop further degradation of peatland. The project (Klimkowska et al., 2010) was carried out in the eastern-central part of the area (c. 7 ha) and consisted of shrub removal (2004–2005), reintroduction of annual mowing and small-scale rewetting. Restoration yielded limited effects, mainly due to large-scale changes in the hydrological system (due to groundwater abstraction) outside the project area.

During 2006-2010, restoration works were carried out on a somewhat larger scale within the EU LIFE funded project "Conservation and upgrading of habitats for rare butterflies of wet, semi-natural meadows" project to secure the best possible conservation status and upgrade the quality of habitats of target butterfly species. As part of a project in 2009, the topsoil was removed to a depth of 40-60 cm (consisting of muck and highly degraded peat) within c. 2 ha plots in the vicinity of the first project (and c. 200 m from the fishponds). Reintroduction of fen plants was carried out by spreading seed hay collected from remnants of fen meadows located nearby.

Main actors, roles and mutual relationship

The Calowanie Fen is mainly private land, until recently used for agricultural purposes (hay meadows; currently largely abandoned), and peat extraction, with highly fragmented ownership. A small part of the peatland is state-owned, however, regional authorities have very limited power.

After the completion of a number of restoration projects, the management of the fen (conservational mowing and shrub removal) was taken over by the administrator - the Mazovian Landscape Park.

The National Support Centre for Agriculture (KOWR) is the main state agency with a strong role in agricultural issues. It is a Polish public finance sector institution, supervised by the Minister of Agriculture and Rural Development.

The Wetlands Conservation Centre (CMok) is an association (NGO) operating throughout Poland in the field of nature conservation since 2001. CMok is in the process of gathering funds to purchase land on Calowanie, taking control of the hydrology and stopping the water abstraction through the fishponds. Together with the Masovian Landscape Park, where the Calowanie Fen is located, it has the highest interest in restoring the area. CMok was a significant partner in the LIFE restoration project and coordinated the project from the technical side. Other partners of the project were: Kampinos National Park (KNP), units responsible for environmental protection - regional directorates for environmental protection (RDOS in Warsaw and RDOS in Lublin), IMUZ (now Institute of Technology and Life Sciences (ITP)) - as a partner responsible for monitoring.

Decision making process

The restoration project was initiated by CMok in opposition to a local entrepreneur who bought 300 ha of land and started a destructive peat extraction operation in the middle of the peatland. The

utilisation of turf-pits as through-flow fishponds (angling sites) is the most damaging use in this area that causes fast degradation of the fen.

Despite large-scale abandonment of hay meadows, decision making is still driven by economic interests, with a dominating role of agricultural subsidies available for those few farmers, who still manage their land.

Strategic and planning instruments

The Natura 2000 site has a management plan that assumes maintenance of extensive land use and activities aimed at protecting wetland birds, butterflies and remnants of fen habitats (alkaline fens, litter meadows). Two additional planning documents for the Natura 2000 site were commissioned to CMok by the General Directorate of Environmental Protection in Warsaw in 2016-2018. Hydrological measures were proposed for restoration and conservation of the habitats and bird species (curley) that are protected in the area. The measures are not being implemented and no action plan exists so far regarding their implementation. Moreover, heavily degraded peatlands are not natural habitats according to the meaning of the Habitats Directive. Therefore no conservation or restoration measures are planned for them in Natura 2000 management plans.

The national implementation of the Water Framework Directive has started with a significant delay. The second revision of the River Basin Management Plan (RBMP, required by the EU directive) was issued in February 2023. It sets a specific environmental objective for the Calowanie Fen: “Increasing the moisture content of the Calowanie Fen and not allowing the construction of new fishponds (as projects that alter hydrologic conditions for natural resources), peat extraction, drainage of wet meadows and marshes. Restoration of degraded wetlands. Creation of buffer zones around watercourses”. Moreover the secon revision of RBMP establishes measures for the Bagno Calowanie Natura 2000 site (to control water levels and stop the decrease of groundwater levels through restoration or maintenance of the dam system) and for the Mazovian National Park (to improve conditions for protected areas).

Objectives for surface water restoration were established by the National programme for surfaces’ water restoration (NPSWR), issued according to the objectives of the first update of the RBMPs in Poland. The document indicates that over 90% of rivers in Poland should be restored to achieve good ecological status of all water bodies by 2027. The contents of the NPSWR do not translate into a programme of measures, the second update of River Basin Management Plans (II update RBMPs).

Also, in 2021, at the request of the General Directorate for Environmental Protection, a draft Strategy for the protection of wetlands in Poland for the years 2022-2032 was developed. Three main objectives of the Strategy have been adopted: (1) Improvement of peatland biodiversity and reduction of greenhouse gas emissions from peatlands by 30%; (2) Improving the state of biodiversity status and supporting natural processes in aquatic ecosystems and increasing water retention in riverside areas,

and (3) Maintaining and strengthening the protection of wetlands within the network of Ramsar sites in Poland.

Lessons learnt

Success and Limiting factors

The key trigger of the first restoration activities was the establishment and active role of the Wetland Conservation Centre (CMok). Its role could be further strengthened by boosting new restoration activities with the achievement of the land acquisition process. Cooperation with national agencies that manage forests and agriculture (administering state land) could trigger more restoration opportunities. The involvement of local people, making them more aware of the benefits of restoration and of new opportunities offered by paludiculture, revealed its crucial importance. This is shown by the conclusions of the workshop with the local community organised as part of the WaterLANDS project (WP2.1) which was held on 9 September 2022 in Podbiel, in the village where the fen is located. Further discussions with the local community should aim to develop a coherent vision of how the rewetted peatland should be used in the future, taking into account the need to maintain the use of the meadows on the edge of the fen.

Currently, the restored part of the fen functions as an interesting biodiversity refuge and a tourist attraction, gathering on boardwalks many visitors (especially weekend trips of Warsawers). Some outskirts of the fen spontaneously regenerate into wilderness areas. However, the large majority of the fen is still deeply drained and continuously deteriorates, with associated GHG emissions.

The impacts of external factors that limited the local restoration effects and favoured the drying process (groundwater extraction at regional level, outside the site itself) impose a higher and overarching vision for the governance of the site, that should consider a more comprehensive spatial scale.

New impetus can be expected by the adoption of a national Strategy for the protection of wetlands in Poland for the years 2022-2032, that should strengthen the network of Polish wetlands (still in consultation). New interest can also arise from the increasing interest of private companies to offset emissions or invest in Nature-based solutions as a corporate social responsibility component in investing in peatlands. Finally, new funding from the EU LIFE Programme is expected to trigger new restoration activities in peatlands of Poland. Indeed, in 2022, LIFE project allocations for Poland have reached a new record, with more than half of the total amount that was allocated for the entire previous programme duration (2014-2020).

The fragmented private ownership of the site, with limited interest in ecological restoration by the site owners, is one of the strongest governance barriers for a successful restoration. Moreover, the national policies, the legal and administrative framework need to change to ensure more attention to

restoration, transforming the current system of subsidies (that favours agricultural exploitation) into new funding for restoration.

National conservation policies in Poland encourage conservation of protected fen meadow species, while at the same time the multifunctional use of the area (by farms, forestry, nature conservation, fishery) is also promoted, creating some conflicts in land use. Regional authorities have very limited power in finding solutions to conflicting land use practices.

Replication

The limited success in restoration activities and a limited consideration in addressing socio-economic challenges caused failing in replicating and upscaling restoration activities. Land ownership and drainage for agriculture remain the major challenges that are limiting replication.

Detailed eco-hydrological study and ecological monitoring (vegetation, biogeochemistry, methane emissions) within several years following restoration allowed for numerous scientific publications, collected in three doctoral dissertations defended at the University of Warsaw and University of Antwerp. These are among the most important sources of information about the effectiveness of topsoil removal restoration technique and eco-hydrological limitations of rewetting. Top soil removal can generally be recommended as a relatively small-scale activity helping to restore fen vegetation. The technique helps to restore high moisture without rising regional water tables (thus overcoming constraints imposed by local drainage) and allows to avoid high eutrophication following rewetting of heavily mineralised peat. However, stabilisation of water levels remains a necessary condition of restoring mire conditions, which can hardly be achieved in hydrologically disturbed landscapes.

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