EcoAdapt –Summary Deliverable 2.4
Synthesis of the Socio-institutional Context Analysis

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Introduction

In the EcoAdapt project, we consider adaptation planning for water resources as a bottom-up process that requires ways to share and co-generate knowledge between scientists and multiple stakeholders operating across different scales and policy areas. Adopting such a bottom-up approach to design and implement context-tailored adaptation strategies through science-society engagement requires building on a good understanding of the socio-institutional context we are working in.

The socio-institutional context analysis is part of Work Package 2 in the EcoAdapt project. The objectives of this analysis are to: 1) generate a shared understanding around the current situation of water resources in the landscapes based on different local perspectives in the Model Forests (MFs); 2) study and identify actors, influences and their relationships in governance networks around water resources planning and management; 3) identify potential 'agents of change' who can be considered project allies to influence decision-making and create more feedback channels to foster collaboration; 4) identify and map factors that may facilitate or constrain processes for water resources adaptation planning in the landscapes; and 5) explore possible entry points that can be considered first steps to start working on adaptation strategies in the MFs building on existing strengths to overcome some of the current barriers to water resources adaptation.

This briefing note synthesizes key findings of the socio-institutional context analysis in three Latin American Model Forests where the project is being implemented: Model Forest Chiquitano in Bolivia (MFC), Model Forest Jujuy in Argentina (MFJ), and Model Forest Araucarias de Alto Malleco in Chile (MFAAM). It also includes remarks on lessons learned throughout the process of co-construction of methods, information gathering and exchange, validation with local actors, and co-generation of knowledge with project partners.

Site Description: Model Forests

In the Model Forest Jujuy, the socio-institutional context analysis is focused on the middle basin Los Pericos-Manantiales. This area is locally known as the "*Area of the Dams and Perilagos*" (ADP). The middle basin is highly populated and is characterised by its agricultural production and a small area of natural vegetation. It has also an important irrigation system in place for tobacco production. The ADP is considered a tourist attraction. Urban housing, forests and farms surround the water dams in this area.

The Model Forest Araucarias de Alto Malleco covers the communes of Lonquimay and Curacautin in the IX Region of the Araucania. Two important river basins cross this territory, the Bio Bio river basin and the Cautín river basin. More than half of the population in Curacautin is

urban, while in Lonquimay Mapuche-Pehuenche indigenous rural communities account for almost half of the population. The main economic activities are farming, cattle ranching, hunting and forestry activities.

In the Chiquitano Model Forest, the project is working in the Zapocó basin, which includes the Zapocó water dam located in the middle basin. The area is located in the Municipality of Concepción, and most of it is covered by forest and cultivated pastures, but there is also subsistence agriculture in the community areas. The main economic activities are cattle ranching, private and communal farming, commercial logging, as well as traditional use of forest for timber and non-timber forest resources.

Methodology

The methodology used for the socio-institutional context analysis was co-constructed with the Model Forest teams. The methodology includes several social science methods, which were adapted to the context of each Model Forest. Methods involved semi-structured interviews, social network mapping[1], workshops to validate results, and participant observation. This helped identify strengths and barriers[2] to water resources adaptation planning. Preliminary results were presented and discussed in synthesis workshops with project partners, which provided a space for reflection, further critical analysis, and learning.

Drivers Affecting Water Resources in the Model Forests

In Argentina, several drivers interact to affect water resources availability and quality in the MFJ. In the upper basin, water problems are related to unsustainable land management. In these upstream areas, deforestation and a lack of appropriate soil conservation practices have led to high erosion and seasonal landslides in the central part of the basin. In the middle basin, reported problems include pollution of the water dams, social tensions around access to water, and concerns about water storage capacity in the long term (e.g. due to siltation). Although the ADP was declared Protected Area under Provincial Law in 2003, it is currently not properly managed, and is affected by a deficient waste management system, overgrazing, and deforestation.

In the case of Chile, local actors in the MFAAM perceive that the main issues around water resources are determined by the existing legal framework, which over time has contributed to a situation of legal water scarcity in the territory. Water resources are legally regulated by the new Water Code, which came into force in 1981. This legal framework promotes the privatization of water resources, transforming water into a tradable good. As a result, in the MFAAM water rights for consumptive use are currently unavailable, and it is only possible to acquire rights for non-consumptive use, which are generally in hand of large private enterprises, mainly from the hydropower sector. As an alternative, rural communities can send a request for water regulation if they can demonstrate historical use of water prior to 1976. Other important drivers affecting water resources in the territory are the establishment of hydroelectric plants in the Bio Bio river basin, deforestation and unsustainable land use practices such as overgrazing.

In the Bolivian MFC, problems affecting water resources in the rural area differ from problems in the urban area. In the rural area, expansion of pastures for cattle and unsustainable logging are influencing the hydrological cycle and resulting in high erosion and sedimentation levels in riverbanks and the Zapocó water dam. In addition, the growing livestock sector results in the establishment of more micro dams across the basin, increasing water demand. In the lower basin, mining activities are also negatively impacting water quality of rivers. In the urban

[1] Schiffer, E. (2007) http://netmap.wordpress.com/about/
[2] Moser, S., & Ekstrom, J.A. (2010). Proceedings of the National Academy of Sciences of the USA

area, activities in the surroundings of the water dam impact its water quality. This includes cattle ranching, clothes and car washing, tourist activities such as fishing and water sports, and disposal of waste and wastewater.

Although the situation of water resources in the MFs is not currently critical, existing biophysical and social stressors may continue, increasing possible social tensions around access to good quality water for domestic consumption and productive activities in the future. This will be exacerbated by changes in climate, which may further affect natural hydro meteorological cycles in the basins, especially during extreme climate events. It can be expected that the future situation of water resources in the landscapes will become critical with potentially serious ecological consequences and social conflicts if strategies are not put in place to prevent them.

Networks for Water Governance

Social network mapping and interviews allowed gaining an understanding of the relationships between actors in the landscape that are directly or indirectly influencing water resources. Also, networks help us identify organisations, institutions and social groups that are key for water governance, either because they i) play a central role in the networks, ii) have high formal or informal influence in the decision making process around water resources, or iii) are important bridges between different scales or actor types with differing interests. In the Model Forests, social networks were mapped from different perspectives using a participatory approach, which resulted in a series of network maps that informed the analysis.

In the information networks, the Municipal Governments were identified as both information providers 'sources' and receivers 'banks'. Such a role was also particular to the MF platforms in the MFJ and the MFAAM. Some actors that are isolated in the networks or do not have flows to other actors are also important to consider, as they may be unknown or unexplored sources of information. Such is the case of universities and research institutes, the *Instituto Nacional de Reforma Agraria*, and the private sector in the MFC, and the local media (environmental journalists), *Agua de los Andes* (drinking water treatment), and *Hidrocuyo* (hydroelectricity generation) in the MFJ.

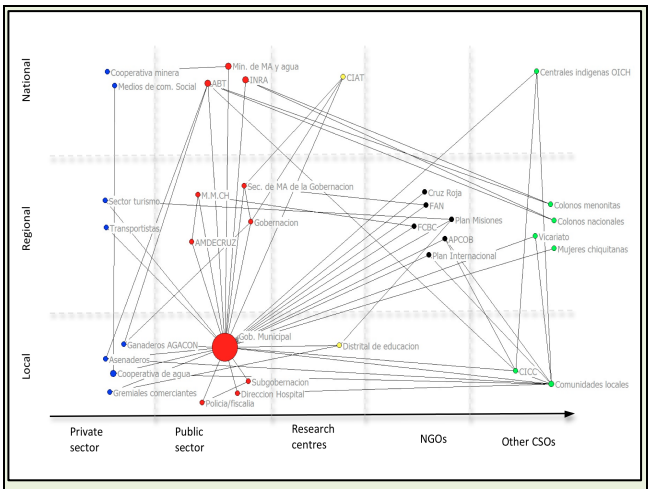

Figure 1. Interaction and scales, from the perspective of public institutions in the MFC, Bolivia. On the x-axis actors are categorized by actor type. Colours also categorise actors by their type, namely actors from the private sector, public institutions, actors from the research community, non-governmental organisations, and actors representing other civil society organisations. On the y-axis actors are categorized by their territorial coverage: local level is the Zapocó river basin, regional level is the Chiquitania region, national level is the entire country of Bolivia. Actor size represents their importance as bridges in the network.

In the water resource planning and management networks, most local participants identify the public institutions as key actors. Public institutions with high number of connections to other actors are: in the MFAAM, the Municipal authorities, the Ministry of Environment, the *Instituto Nacional de Desarrollo Agropecuario*, the *Dirección General de Aguas*, and the *Corporación Nacional Forestal*; in the MFJ, the Provincial Government, Municipal Government of El Carmen, *Recursos Hidricos*, and the *Intendencia de los Diques*; and in the MFC, the Municipal Government, the *Autoridad de Bosques y Tierra*, the Provincial Government, and

the *Instituto Nacional de Reforma Agraria*. To varying extents, all these public entities have the legal mandate to oversee and support the management of natural resources and development processes in the landscapes. An indication of this is that most of these public entities are also perceived to have a high level of formal influence in the decision-making process related to water resources.

In most of the analysed networks, public entities were not the only ones showing a central role in the governance of water resources. Other actors with high number of connections are some NGOs and representatives of the civil society such as the Model Forest platforms in the case of MFJ and MFAAM, representatives of the indigenous people in the MFC, and agricultural entrepreneurs in the MFAAM. During validation workshops, many local actors highlighted that civil society needs to be included in the governance of water resources as they are the direct users/beneficiaries of the resource. However, members of the civil society identified themselves as having low influence or advocacy in the water management decision-making, with exception of rural communities in the MFC where formal channels exist for local participation in the planning process.

In addition, the private sector shows few connections to other actors in all three landscapes, in most instances linking only to entities they are legally expected to respond to. In certain instances, the private sector is identified as having high level of informal influence in the decision-making process. This is the case of *Hidrocuyo*, the *Consorcio de Riego* and the *Cámara de Tabaco* in the MFJ, hydroelectric plants, and agriculture and forestry enterprises in the MFAAM, and the *Asociación de Ganaderos de Concepción* and the *Cámara Hotelera* in the MFC. Links to influential entities of the private sector may need to be strategically strengthened if water resources adaptation planning is to be inclusive of different influential views and sometimes even conflicting interests in the landscapes.

Furthermore, it is important to highlight the role of actors as bridges between different perspectives and spatial scales. In the MFC, the Municipal Government plays a bridging role between other public entities, civil society, NGOs and the private sector, as illustrated in Figure 1. Indigenous organisations are 'bridges' between rural communities and the Central State. In the MFAAM, public institutions are also important bridges between spatial scales, but they are dominated by hierarchical governance structures, which reflect the centralised and top-down planning approach adopted by the Chilean Government.

Finally, in the MFAAM and the MFJ, the MF platforms are identified as important bridging actors between organisations with different worldviews in the landscapes. The platforms are recognised as spaces for dialogue. As such, they are also considered potentially important for conflict resolution regarding water resources should this arise in the future.

On the basis of results generated with the network mapping and the interviews we also identified agents of change, who have specific attributes described in Box 1 and who are considered under the project framework as allies to generate the desired change in the Model Forests. To achieve this change, it is strategic for an agent of change to be connected to, or able to have influence on, the key actors identified in the water governance networks.

Box 1. Attributes of an agent of change are:

- *To be proactive and reflexive*
- *To be immersed in its territory*
- *To have the capacity to mobilise its own social group or various groups*
- *To be connected to one or more key actors or have influence on them*
- *To have the capacity to link, integrate, and communicate different worldviews, knowledge and visions*
- *To have time to commit to transformative activities*
- *To be motivated to support the process of desired change in its territory*

Strengths and Barriers to Water Resources Adaptation Planning

The interviews, network mapping and validation workshops helped identify a series of conditions that could constrain or enable water resources adaptation planning in the sites. Barriers are factors that may hinder progress from one stage to another of the adaptation process or result in problems or unintended consequences later. Strengths are existing capacities in the landscapes that can help overcome these barriers and facilitate the adaptation process.

For this analysis, we use the common phases of decision-making to identify and organize barriers and strengths. This includes three phases: i) understanding the problem (i.e. diagnosis), ii) planning for water resources and adaptation strategies, and iii) managing the implementation of these strategies.

Moreover, barriers could relate more to current circumstances in the landscapes and be more contemporary in nature (i.e. situational), or part of a legacy and more embedded in structures that have been created over longer periods of time (i.e. structural). In general, structural barriers are more difficult to overcome requiring significant resources and long-term strategies, while situational barriers are more contemporary and proximate and may be easier to address with locally based short-term actions. This will ultimately depend on the existing strengths in the landscapes.

Hereafter we describe briefly some of the barriers and strengths in the Model Forests. While the analysis provides common maps – see Figures 2 and 3 – that structure, organize and compare similar and different barriers and strengths between Model Forests, it is important to highlight that the nature, origin and drivers of these barriers and strengths are distinct in each Model Forest.

Barriers to adaptation of water resources:

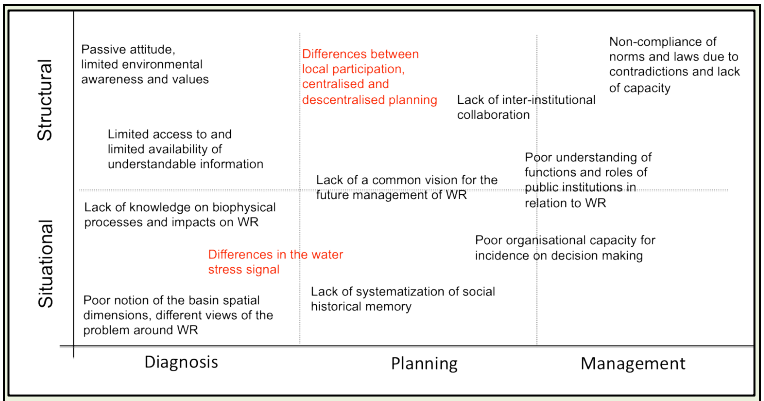

Figure *2. Map comparing the barriers to water resources adaptation planning in the Model Forests. Text in black highlights similarities, while text in red highlights differences. The x-axis organises the barriers in terms of their relevance to the phases of decision-making, and the y-axis separates structural from situational barriers.*

One of the common barriers across all landscapes is a **limited notion of the spatial dimensions of the basin** and where the different local actors are located in it. Moreover, **in different parts of the basin, the perceived problems around water resources are different**.

One of the main **differences between the three MFs is the water stress signal**. While in the MFC and the MFJ physical water scarcity is a current issue, in the MFAAM a threshold has not been reached for water to be perceived as scare due to a **lack of physical availability**. In fact, in the MFAAM, the issue is around l**egal water scarcity.**

In all three landscapes there is a general lack of knowledge on the dynamics between forests, water and soil, although there is awareness about their interactions. One of the main reasons for this, according to local actors, is the **lack of technical studies in the landscapes investigating hydrological, climatic and land use dynamics.** Neither is there a good understanding about the **impacts of different human activities on water resources**.

Lack of information is not the only a problem in the landscapes, **but also a restricted access to existing information.** In many instances, this also relates to the **format in which information is presented to be assimilated by the user**.

A barrier mentioned in all three landscapes is the **general lack of a common vision for the future of water resources**. There are conflicting interests in the landscapes, diverging ideas and power relations that obstruct the formation of a shared understanding of the problem and a common vision for the management of water resources. Contradictory dominant visions exist in the landscapes, which will require negotiation.

The **weak inter-institutional collaboration** also complicates the decision-making process. Collaboration is further hampered by the **lack of clarity on the roles and functions of public institutions in relation to water resources**.

Weak collaboration may also relate to **passive attitudes among the local actors in the landscapes**. In the MFJ, interviewed actors attribute this passive attitude to a **general lack of environmental awareness and values attached to nature.** In the case of the MFAAM, the high dependency on the vertical governance approach of the Central Government has also promoted a passive attitude amongst actors in the territory.

A **key difference between the Model Forests** is the way **local participation relates to the planning processes**. In the MFAAM there is a sense of fear in opening planning processes to decentralised local participation because of perceived potential loss of control or possible chaos. In the MFJ, local participation seems to be hindered by contradictory interests in the landscape, political dynamics and fatigue around gatherings and discussions with little impact on practical actions. In the MFC, local participation is actually considered a strength, as there are legal instruments facilitating a decentralised and structured process for engagement in the planning process.

Finally, a further barrier that is common to all sites is the **weak implementation of the regulatory framework**. This can result from different problems such as **contradictory rules, poor implementation and regulation capacity, lack of knowledge about the regulatory frameworks and problems with the regulatory frameworks themselves.**

Strengths to adaptation of water resources:

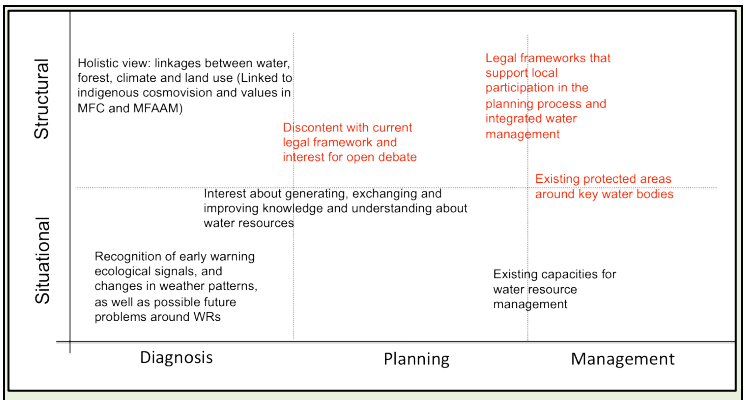

Figure 3. *Map comparing the strengths to water resources adaptation planning in the Model Forests. Text in black highlights similarities, while text in red highlights differences. The x-axis organises the strengths in terms of their relevance to the phases of decision-making, and the y-axis separates structural from situational strengths.*

One of the main common strengths shared amongst the three landscapes is the **recognition of early warning ecological signals**. In all MFs, actors recognise **disturbances in the landscape with ecological impacts** such as deforestation patterns, erosion problems, and over-exploitation of resources. They also acknowledge a **change in the precipitation patterns and an increase in temperature** over the past decades, with consequences on the production calendar.

Equally important is that most of the local actors in the three MF landscapes recognize the **linkages between water, forests, land and climate**, although the mechanisms behind these linkages are not well understood. This **holistic view of the system is partly linked to cultural values of indigenous communities** in the MFAAM and MFC.

A strength across all sites is the **existing interest in generating, exchanging and improving knowledge and understanding about water resources**. In the MFAAM, the general **discontent with the current legal framework** because of the perceived negative effects it has on water management in the landscape has created a genuine interest in a larger open debate about water resources.

Furthermore, all three MFs have **existing capacities** on which to build **for better water resource management.** In the MFC, different actors in the landscape conducted several **trainings and capacity building activities**.

A strength that is not equally used in all sites is the **existence of legal frameworks that support local participation in the planning process**. In the MFC, the normative supports decentralised planning and popular participation in decision-making. In the case of the MFAAM this strength is still very weak, mainly due to limited knowledge about the regulation that promotes it, as well as financial and political constraints.

Finally, a strength that is **not common to all sites** but is an important instrument for future water resource management is the **protected areas around key water bodies** in the MFJ and MFC.

Strategic entry points to promote change in the landscapes

Entry points are first steps that provide directional guidance on possible ways to start working on the transformation that EcoAdapt would like to promote in the MF landscapes.

To **facilitate empowerment and local participation** in the water resources adaptation planning in the landscapes, a first entry point is **the generation of new technical information** through studies on hydrological, ecological and climatological processes in the landscapes. Capacities to generate technical information already exist in the landscapes in credible local universities and research institutes, but they are not well exploited, or potential sources in the water information networks are isolated. Complementing scientific information is **existing local knowledge, which needs to be systematized** to analyse and use the social and historical memory around water resources in a more structured manner.

In addition, **information needs to be presented in formats that are relevant to different users of diverse backgrounds and interests**. An entry point is the support of **adequate communication** and the use of **appropriate language** to share new information taking into consideration uncertainties and unknowns and maintaining rigor. A start point identified in the MFJ and MFC in this respect is working with the local media (e.g. environmental journalists) and schools to reach the general public and particularly the young generation.

A further entry point is **building organisational capacity and leadership for decision-making**. Strengthening organisational capacity is fundamental to assimilate and manage information and increase the capacity to participate in or have influence on decision-making. This process supports a bottom-up approach to planning, which can have cascading effects across multiple scales if appropriate spaces for participation are created. This also relates to the creation of mechanisms that enable participation and dialogue between local actors, and help build, strengthen and expand social networks.

Finally, another entry point is the **integration of water resources adaptation as a strategic theme in the existing development agendas** in the landscapes. Mainstreaming water resources management in local development strategies is partially adopted in some MFs, but the process is highly fragmented and it does not consider possible climate future scenarios. The challenge ahead lies in developing integrated approaches to manage water resources at the landscape-level considering multiple worldviews, development interests and a changing climate.

Lessons learned

The co-construction of the socio-institutional context analysis facilitated the integration of local and scientific knowledge through an iterative process of constant exchange between the MF teams and the scientists. This process allowed the generation of project impacts along the way and not only at the end of the process.

On the one hand, the process of co-construction promoted empowerment among the local actors in the MFs who participated. Particularly potential agents of change are engaged in a process that goes beyond a consultation. They are involved in a process where they adopt the lead role in achieving the desired change that EcoAdapt would like to promote in the landscapes. In this sense, the process of co-construction also encourages ownership and commitment, which are significant to support a bottom-up process for adaptation planning. On the other hand, scientists and civil society working together facilitates collective learning and in some instances development of new skills.

Of course, there are also challenges inherent to the participatory process of co-constructing knowledge. One of the main challenges is time investment. Another is balancing differing interests in the process and unexpected changes along the way. This requires adaptive management and flexibility to find diverse ways to achieve the desired outcomes.

Conclusions

This initial phase of the project was the first opportunity to generate interest around water resources in the landscapes. Social networks surrounding this topic are slowly emerging as a result of this first phase of work.

The socio-institutional context analysis working in close collaboration with the MF teams and engaging a range of actors in each landscape helped build a legitimate analysis of water resources and gain a shared understanding about several entry points to improve collaboration in the landscapes, create interest, build capacity to address some of the identified barriers, and support empowerment of local actors to design and plan for water resources adaptation.

In addition, the process of co-construction facilitated continued learning between scientists and civil society organizations, which is at the heart of the project's philosophy. Furthermore, it generated trust, ownership and interest to continue the process, which is fundamental for collaboration and ultimately positive change in the Model Forests.

Acknowledgements

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Further information and contact

This briefing note is based on a synthesis of three reports that analyse the socio-institutional context in the Model Forest Araucarias de Alto Malleco, Model Forest Chiquitano, and Model Forest Jujuy.

Model Forest Araucarias de Alto Malleco, Chile

Model Forest Chiquitano, Bolivia

Model Forest Jujuy, Argentina

If you are interested in more detail, please visit:
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