

CLIMATE CHANGE AND WATER ADAPTIVE MANAGEMENT THROUGH TRANSBOUNDARY COOPERATION. THE CASE OF THE GUADIANA RIVER BASIN

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Abstract:

In the EU, regions are acquiring greater decisional powers in the recent years. However, the ‘new regions’ do not longer correspond to the divisions that once were useful to the particular goals of the old nation-states, but are now created upon other new cooperation goals, including environment and sustainability, that transcend country borders. The mainstreaming of climate change into regional development goals and processes, including the adoption of new forms of governance and resource management related to adaptive management of shared resources such as transboundary river basins, entail the need to find new ways of cooperation and collaboration capable to erode existing regional divisions while at the same time developing new ones. We look at the role played by ‘atypical’ bridging organisations in the case of the Guadiana river basin, in Iberia, and to the extent that the new emerging cross-border institutional arrangements can be seen as an effective adaptive management response to mounting environmental threats such as climate change and water scarcity.

Key words: adaptive management, climate change, , Cross-border cooperation, Guadiana river basin regional development,

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1. INTRODUCTION

Current European water assessment and management systems are increasingly under pressure to develop new practices capable to meet growing societal demands for sustainable development as well as mounting biophysical pressures such as climate change. Climate scenarios suggest an increase in the vulnerability of river basins, with uncertainty and potential surprises likely to require a more decisive move towards adaptive governance systems (IPPC, 2007).

Adaptive water management, in the context of river basin frameworks and water management regimes, is rapidly becoming the recurrent paradigm used to underline the limitations of traditional engineering approaches to resource management. Adaptive water management builds on the ideas of social learning processes and proposes a change in management practices based on integration of new information and of a plurality of insights and perspectives (Pahl-Wohl, 2007). It presupposes a capacity to cope and respond to challenges so that “reflects learning, flexibility to experiment and novel options” (Walker et al, 2002). Bormann (1994) defined “adaptive management as learning to manage by managing to learn”. In general, it seeks to improve the capacity of the whole system to respond to change in a more proactive way, replacing the paradigm of “management as control” by the “management as learning” one (Gleick, 2003).

Currently, resource policy and management processes are largely subject to the dominant paradigm of technical determinism and administrative decision making, even though new concepts and institutional changes are being introduced. While it is already possible to observe new transitional modes of engagement in the ways water regimes are now being restructured, important obstacles (for instance, cultural resistance) still remain (Galaz, 2005; Moberg and Galaz, 2005; Pahl Wostl, 2002).

Moving towards a more flexible and adaptive paradigm capable to deal with uncertainty, multiple perspectives –both from social and natural sciences, expert and non-expert- and multiple actors (national, regional and local governments, NGO) will require a shift in the design of institutions. In particular, the way institutions are designed and the interactions between public and private actors are formulated is determinant in the attempt to formulate integrated and holistic policy options able to prevent and reduce the effects of climate change in river basins (Pahl-Wohl, 2002). A more adequate institutional framework in this context may be that which facilitates and distributes a reasoned choice among an open range of options and provides differentiated and clear responsibilities according to institutional and technical capacities among a multiple set of stakeholders, which entails the development of a plural and open institutional structure (Kallis et al, 2004).

In this article, taking as a case study the transboundary Spanish-portuguese Guadiana river basin, we discuss the relationships and links between river basin governance and the cross border cooperation mechanisms supported by the EU through the 2007-2013 Territorial Cooperation Objective, the successor of the “Interreg” initiative. These mechanisms seek to foster integration and overcome cultural, institutional and administrative barriers derived from existing boundary divisions. We highlight the potential role of cross border organisations. In this case, the *Gabinete de Iniciativas Transfronterizas* (GIT), is the operational unit of Working Communities Algarbe-Andalusia and Alentejo-Andalusia. It does not work only as an implementation or executive agency in the application of EU Regional Policies, but it also acts as bridging organisation. It also serve to catalyse change facilitating multi-level interactions due to its capacity to operate at different scales with some degree of flexibility with different actors and environments in the framework of transboundary strategic processes. While originally such processes are designed to support development goals on a regional level

these may complement transboundary cooperation at the whole river basin ecosystem scale integrating and mainstreaming new issues such as climate change. In this regard, the concept of bridging organizations is particularly useful, as it refers to mid-level organisations that facilitate cross-scale interactions (Hahn et al, 2005). Bridge organizations may serve thus as catalysts of change providing resources, knowledge and mainly a framework or a platform for multilevel cooperation (Folke et al, 2005). Therefore, an organization in charge of leading those processes in the intersection between state and society linking different networks and domains may constitute the right instrument to mobilize public and private actors and resources to achieve shared objectives.

2. CHANGING PATTERNS OF GOVERNANCE WITH REGARD TO WATER MANAGEMENT

An institution can be described as “a relatively stable collection of practices and rules defining appropriate behaviour for specific groups or actors in specific situations” (March and Olsen, 1999:33). A more extensive definition has been provided by Keohane et al (1993:45), according to whom institutions are “persistent and connected set of rules and practices that describe behavioural roles, constrain activity and shape expectations. They may take the form of bureaucratic organizations, regimes (rule-structures that do not necessarily have organizations attached) or conventions (informal practices)”. On the other hand, the concept of governance captures important changes in the way the function of governing societies is performed in contemporary societies and, at the same time, provides a useful analytical perspective for observing the functional conditions (or institutional imperatives) in terms of the type of governance needed to organize and manage the collective decision-making (Kooiman, 2003). The term “governance” is often used in a normative sense to describe the move towards a process in which formal institutions enter into contact with other social actors, often outside the core of public agencies, around the formulation and implementation of public policies. This is related to the emergence of relational mechanisms that are more co-operative, consensual and democratic than the traditional ones, which tend to be more hierarchical and bureaucratic. The Commission’s White Paper on “European Governance” (2001: 18) recognised that *“Policies can no longer be effective unless they are prepared, implemented and enforced in a more inclusive way”*. In this guise, the document proposed transferring more powers to the levels of government nearer citizens and society.

Against this background, it has been argued that the European policy context is characterized by institutional specialization and the fragmentation of policies and politics (Rhodes, 1997). From this perspective, the concept of multi-level governance stresses that the EU has become a polity where authority is dispersed between levels of governance and among public and private actors (Rosamond, 2001). According to Hooghe and Marks (2001), “...the point of departure for the multi-level governance approach is the existence of overlapping competencies among multiple levels of government and the interaction of political actors across those levels”. From this perspective, the management of networks is a critical issue to bring together means and actors towards the achievement of common objectives. The network concept is seen as a new nexus form of governance and as an adaptive response to the emergence of the more complex society. Networks appear as a cause and as a consequence of increasing sectoralization and functional differentiation, the reshaped scope and role of state policy-making, decentralization and fragmentation of power, the blurring of boundaries between the public and the private spheres, and the transnationalization of politics (Kenis and Schneider, 1991). According to Jachtenfuchs (2001), “the network approach suggests that governance should be based on looser patterns of relationships between public authorities at the different levels,

associations and citizens”. Networks are flexible modes of interaction that retain the ability to adapt as problems change and new responses to cope with them are learned. The assumption, although there is no guarantee for that, is that new forms of governance that entail stakeholder participation and citizen deliberation, public-private partnerships, can decisively contribute to improve the legitimacy, an fill implementation and governance gaps, while increasing social learning through the improvement of institutional and relational capacities of both public and private actors at the different scales in the context of European multilevel governance.

When debating the institutional setting that favours resilience and adaptability of social ecological systems to global changes, authors like Westley (2002) and Tompkins and Adger (2002) point out the need to manage problems in different domains while linking networks at all levels in an interactive way. Olsson also argues that linking networks facilitates learning and more adaptive responses to change (Olsson, 2005). In order to facilitate these links, innovative mechanisms that operate in the intersection between state and society may help to generate social capital (Evans, 1996). In this sense, Ostrom (2005) claims that success stories in sustaining common pool resources rely on rich mixtures of public and private instruments. For that, she advocates institutional diversity (Ostrom 2005)- public- private policy networks based on iterative and decentralised solutions can be seen as an adaptive response to bureaucracy and market failures.

With regard to European water regimes, the Water Framework Directive (2000) established the river basin as the unit upon which resource governance may better achieve sustainability objectives. Following the incorporation of this directive into national legislation, European member states must know how to meet the established ecological and economic requirements as well as to integrate stakeholder participation into water management and planning activities (van Ast, 2003; Vantanen, 2005). The WFD echoes these principles by calling “for the involvement of the general public before final decisions on the necessary measures” are taken (EC, 2000; Preamble 46). To achieve these new forms of water governance that involves a more deliberative social learning approach in water policy-making the water agencies, it has been argued that the role of facilitators and leadership is crucial (Hooper, 2005 Mostert et al. 2007;) This model seeks to bring previously fragmented policy interventions under the unifying governance structure of the river basin (EC, 2000).

This perspective is in line with authors that suggest that river basin regimes in some European countries are experimenting a shift from technical management paradigms with centralized planning and control, and an emphasis on building hard physical infrastructures towards more open, participatory and polycentric ones where emphasis is placed in social learning, building social-ecological resilience capacity and creating conditions for agents’ collaboration (Huitema and Becker, 2005).

However, since focus has been on water regimes and the application of the WFD, not enough research efforts have been devoted yet to understand the relationships between water management and other resource and environmental policy issues such as climate change, energy or sustainability objectives in an integrated manner. Administrative regimes or systems of rules dealing with the consequences of other types of resource use are usually addressed by different institutions, actors, and processes. A more integrated response is needed to better understand how these relationships can be improved in terms of achieving the sustainability goals identified by the scientific community as well as local and regional actors. Ultimately, better integration involves identifying interdependencies between multiple policy domains and administrative agencies both in terms of synergies and conflicts. Trade-offs among them are common and new modes of agent interaction are needed in order to enhance integration, adaptive change and support learning processes.

From this perspective, responses and adaptation to the threats posed by climate change are needed across many different levels in the governance structure. According to Weaver et al (2006), “Integrating climate change into routine activities will depend upon making appropriate information, tools, methods and processes available for this to happen, as well as on building awareness of the need for integration and related capacities”.

3. CROSS BORDER COOPERATION AND SUSTAINABLE DEVELOPMENT IN THE EU .

There is a long tradition of cross-border co-operation in Europe. After the Second World War, contacts began between representatives of both sides of the border in several peripheral areas throughout Europe. The intention behind these initiatives was to improve living conditions in the border zones by progressively dismantling some of the more negative institutional, economic, social, cultural and natural barriers that impeded the improvement of living conditions of populations inhabiting those areas. In view of the marginalisation of the peripheral areas in most countries, stress was laid on the need to promote new ways of interaction in order to overcome the perverse effects of this situation. Nevertheless, the absence of a common legal framework and the necessary institutional instruments was a severe limitation. This is why in many European countries, regional and local associations were gradually set up on both sides of the border based on respect for national law (Gabbe et al, 2000). This is how the first experiments in cross-border co-operation arose on the German-Dutch border (Euregio) and on the border between France, Germany and Switzerland (Region Basiliensis).

Faithful to its founding objectives, the Council of Europe took this type of initiative on board in the 1960s, focusing its efforts on discussing instruments that would improve the legal status of the new cross-border entities with a view to creating stable but also dynamic structures, given that from a legal point of view in those times, it was difficult to set up an administrative body in charge of a cross-border area at the sub-national level. In 1971, the Association of European Border Regions (AEBR) was set up with the aim of stimulating co-operation between the European institutions and the cross-border co-operation communities in existence at that time (Benz and Eberlein, 1999).

However, it was not until the end of the 1980s that there was a major expansion of cross-border projects and co-operation entities. With the European Single Market, the European integration process in general and the democratic transitions in Central and Eastern Europe made a special contribution in this regard (AEBR, 2004). In the EU, the most important boost given to transboundary cooperation had to do with the start, in 1988, of the INTERREG programme by means of which the European Commission (EC) offered financial subsidies to cross-border initiatives fulfilling certain requirements (European Parliament, 2004).

At present, there are over 70 cross-border regions in Europe going under a variety of names: Euroregions, Euregios or Working Communities. Before the INTERREG programme went into operation, there were only 26 of them (European Parliament, 2004). These figures show the impact this Community initiative has had on the development of cross border cooperation in the EU. INTERREG fosters cross border cooperation on four main aspects:

- Priority I: infrastructures, planning and rural development of the crossborder space
- Priority II: Awareness, promotion and conservation of the environment and patrimonial and natural resources

- Priority III: Socioeconomic development and employment support.
- Priority 4: Promotion of cooperation and institutional and social integration

Based on the experience of the INTERREG initiative, the EC has put forward territorial co-operation as a new aim of the Structural Funds for the period 2007-2013 and proposed the setting up of European Groupings of Cross-border Co-operation with the support of the corresponding financial instrument. In some cases, EU initiatives such as INTERREG and the recently approved EU Territorial Cooperation Objective (2007 – 2013) attempt to create new structures of governance that are not a new tier of local or regional government, but a space for exchanges and cooperation between public- and private-sector actors. Although they encompass the cross-border activities of a given area, most of the actions taken by the competent authorities are in accordance with their respective national laws (Gabbe et al, 2000). These new institutional mechanisms act as platforms for cross-border relationships between citizens, politicians, institutions, economic forces, knowledge-holders, and other social and cultural agents. However, they also face difficulties that arise from the differences, in terms of power distribution, language and administrative cultures, between the administrative agencies involved in the policy process (Benz and Eberlein, 1999).

Due to the lack of an own administrative structure, these structures are often dependent on resources and decision of other governmental scales and instances to implement their policies and visions. Their activities need to be translated to the regional contexts through the establishment of cooperative arrangements and the development of political and technical skills very much dependent on the leadership capacity and exchange of cognitive resources to manage cooperation under common public policies. Apart from the involvement of other governmental levels in a coordinated fashion, the mobilization of private and civil society actors through social networks becomes crucial in terms of advancing in the effective governance of the Euroregions and Working Communities.

Indeed, the flexible structure is designed to foster a more dynamic type of relationship among the actors who take part of it, while at the same time moving away from bureaucratic obstacles, rigid functions and hierarchies. In the current context of interdependencies and the juxtaposition of competencies between different governmental scales and private actors, the distribution of functions cannot be the result of any single automatic operation or decision. On the contrary, must derive as the outcome of a process of negotiation and co-ordination among the different actors operating in the network (institutions, economic agents, NGOs and citizens). These challenges are illustrative of the concept of multilevel governance, which constitutes one of the main features of the EU political processes.

In the case of transboundary river basins, institutions operating across boundaries can have responsibility for a portfolio of topics, such as economic and regional development, energy, environmental protection, tourism and leisure, agriculture, to name a few. Decisions in these policy arenas are likely to have a significant influence on water demand, as well as influencing climate change adaptation policies. Regularly, those policies and programmes come from other scales and governmental levels than the river basin one, therefore making the integration of objectives and means more complicated.

In short, regions are acquiring greater decisional powers in the recent years. However, the ‘new regions’ do not longer correspond to the divisions that once were useful to the particular goals of the old nation-states, but are now created upon other new cooperation goals (including environment and sustainability) that transcend country borders. In order to advance towards a more adaptive governance structure capable to deal with the new environmental risks and uncertainties, the different governance scales need to be integrated and coordinated towards the achievement of common objectives.

For policies, plans and programmes need to be coherent among them. However, and as word of caution, depending on the specific goals and strategies formulated, and the institutional, technical and human capacities acquired, the aforementioned cross border structures can also constitute a barrier to sustainable transboundary river basin cooperation and adaptive water management in so far as its development and growth goals conflicts with other purposes such as abating climate change considerations. In the next section, we introduce the case study of the Guadiana river basin as an example of transboundary basin where responsibilities distributed across different governmental scales and cooperation among them can become crucial to integrate such objectives and means.

III. THE GUADIANA RIVER BASIN AND THE ADAM PROJECT: APPRAISING TRANSBOUNDARY COOPERATION IN THE CONTEXT OF CLIMATE CHANGE

III. 1 The ADAM project.

The European funded research project ADAM (Adaptation and Mitigation Strategies: Supporting European climate policy, www.adamproject.eu) aims to contribute to socially and ecologically robust adaptation and mitigation strategies. Climate policy options are appraised through social learning processes among relevant stakeholders, policy makers and scientists and looks at methods that can serve to those purposes (Weaver et al. 2006). Transboundary cooperation in the Lower Guadiana is one of the policy options that is studied in the ADAM project with respect to its contribution to coping with climate change.

In the framework of ADAM, a first transboundary stakeholder meeting was held in Mertola in December 2006 where main climate change impacts in Lower Guadiana and associated adaptation measures were identified (ADAM Workshop, 2006). Among them, the need for more coordination in the transboundary basin both among public as well as private actors was perceived. At the same time, in depth interviews suggested that few environmental transboundary projects were being implemented in the area, isolated from each other and lacking an integrated approach. Three transboundary projects carried out both by public and private partners were cited by representatives of the Environmental Department of the Andalusian Government: “um cordao verde para o sul de Portugal”, the creation of a Transboundary Sustainable Development Observatory and a Reforestation Plan.

III. 2 The environmental context

The Guadiana river basin lies between Spain and Portugal and constitutes one of the three main drainage units of the Iberian Peninsula. It has a total drainage area of 66,800 km². Its climate is semi-arid with low irregular precipitation (440mm/year) and constitutes one of the Spanish river basin with the lowest fluvial input in natural conditions. (Confederación Hidrográfica Guadiana, 2004). Most of the river basin lays in the Spanish side (see figure 1).



Figure 1. The Guadiana river basin.

The strong modifications of the natural hydrological regime, in the form of dams, illegal dwells and increasing urbanization pressures within the Guadiana River basin in the last four decades have caused mounting problems with water scarcity along the Portuguese-Spanish border. According to local stakeholders consulted within the first year of the ADAM project local populations are beginning to realize that climate change may lead to adverse impacts of the regions human activities (ADAM Workshop, 2006). This is in accordance with research on the area which shows that by 2100 most of the scenarios in the Iberian Peninsula project a temperature increase in the interval 4-7 degrees (SIAM, 2002). According to the Spanish ECCE Project (2005), “the climate changes projected show a worsening of the current situation of desertification, particularly by the impact of forest fires and the loss of fertility, especially in the dry and semiarid regions of Mediterranean Spain. The carbon content of Spanish soil, and thus its fertility, will also decrease due to climate change, affecting its physical, chemical and biological properties.” The Lower Guadiana region is particularly vulnerable. According to the Portuguese SIAM Project (2002), “Sado and Guadiana stand out as the river basins more vulnerable to climate change. HadCM3 estimates a 60% decrease in annual runoff by 2100”. Water shortages, summer droughts and desertification are very likely to increase. This reinforces the need for adequate and holistic water management, integrated in wider concerns and strategies that include actions dealing with erosion and desertification prevention policies.

III. 3. Governance and institutional context: the role of new atypical organizations.

In Spain, Hydrologic Confederations at the level of the river basin are responsible for regional water plans, the planning of projects and the allocation of water among users. The main actors of the water policy community consist of the Corps of civil Engineers, the main agricultural organizations, construction companies, electricity companies and chief bodies of hydraulic administrations. However, there is an intense on going process of pressure to open up this closed policy community, challenged by new actors. Academics, local groups and regional communities and environmental organizations are vocal and very active in their positions (Sauri and del Moral, 2001). The Guadiana Water Plan was approved by the Spanish Government in 1998. It included adaptation measures such as actions

to correct the overexploitation' of the aquifers in the Spanish part of the Guadiana Basin. Nevertheless, the result of these actions has not been effective enough, since there is an ongoing conflict between groundwater irrigation development and aquatic ecosystems conservation. The Guadiana catchment in this part distributes by various Autonomous Communities- Extremadura, Castilla-La Mancha and Andalucía- , which have powers and competences on several domains (tourism, agriculture and environment among others) being specially represented the provinces of Badajoz, Ciudad Real and Huelva.

Water management relates to the responsibility of the Central government for investment and construction of water infrastructure. In this sense, the role of the Ministry of Planning is central. Despite early plans, there are no river basin authorities in Portugal. However, the Institute for Water (INAG) and the Regional Directorates are responsible together with the Ministry of Environment for the drafting of the 15 river basin plans for the Portuguese territory. Although the Portuguese Guadiana River Basin Plan (2001), administratively divided between the Alentejo region and the Algarve region, acknowledges water quantity problems, the solutions are oriented towards the construction of large water infrastructures such as the Alqueva dam or the rehabilitation of irrigation infrastructures, without having an integrated view over water resources (WWF, 2003).

As most of the transboundary rivers originate in Spain and the Portuguese authorities are concerned about the quantity and quality of waters, cooperation among both countries on those issues has a long tradition. In 1998, Spain and Portugal signed the last and currently applicable Treaty "Convention on Cooperation for the Protection and Sustainable Use of the Portuguese-Spanish River Basins", which constituted the Commission for the Convention Development and Application (CDAC). There are a number of Working Groups -one of them focused on the implementation of the Water Framework Directive (WFD)- and Sub-commissions working in the Guadiana and several joint studies have been executed in the transboundary river basin. Despite the advances (in terms of information and cooperation) introduced by the Convention, joint management is yet to be achieved (Maya, 2001). According to the WFD (2000), the coordination of competent authorities in international river basins shall be ensured, while the Member States may use already existing structures formed according to joint agreements.

Therefore, transboundary links between Spanish and Portuguese water regimes and networks are being promoted through these institutional mechanisms and through the implementation of the WFD. An intensification of cooperation and negotiation between Portugal and Spain has been observed in the last decades, particularly around the issue of water resources. However, most of the plans and programs that deal with rural development, agriculture, tourism or climate change have a *in-state* regional nature (all of them very dependent upon water regimes). Despite preliminary actions have been promoted to deal with water management issues in the Guadiana basin from a transboundary perspective, the same level of efforts has not been devoted to coordinate sectors such as tourism and agriculture that highly influence water demand. Hence, there is still a lot of scope for improvement and development of transboundary institutional mechanisms at the regional scale aimed at complementing the management of river basin resources while mainstreaming other environmental policies, including climate change, in a more coherent way.

In the Lower Guadiana region, we looked at the "Gabinete de Iniciativas Transfronterizas (GIT) Algarve-Alentejo-Andalucía"(Office of Cross-Border Initiatives Algarve-Alentejo-Andalucía), an organisation that resulted from a project approved within INTERREG IIIA Spain-Portugal in 2004. This initiative, despite being conceived from a unitary perspective, is made up of three sections:

General Secretariat of Foreign Action (*Secretaría General de Acción Exterior*) of the Junta de Andalucía, the Algarbe Commission of Coordination and Regional Development, and the Alentejo Commission of Coordination and Regional Development. The purpose of the GIT is to support regional authorities in the implementation of the cooperation policies to be established between them and represents the operational unit of the cross border Working Communities Algarbe-Andalusia and Alentejo-Andalusia. Such initiative can be understood as a new form of 'atypical' organisation, in which both formal and non-formal networks, operating at different levels and also across different institutional borders are constituted to meet the new regional challenges posed by growing economic globalisation and also a changing political and natural environment. Such type of bridging organisation can be seen as an adaptive response to social-ecological changes that demand for new forms of institutional cooperation and agent collaboration.

In particular, the GIT is currently leading a participative process conducive to the approval of an integrated transboundary strategy for the period 2007-2013 regarding several domains: regional development, energy, environment, transports and rural development. This strategy seeks to give a more comprehensive overview and a direction to all the transboundary projects operating in this zone. On the basis of the different experiences, the Practical Guide on Cross Border Cooperation stresses the potential that the joint preparation and production of a transboundary strategy have for reducing the border's typical barrier effect (Gabbe et al, 2000). Moreover, advantage can be taken of the opportunity to mobilise actors from both sides of the border and put them in contact with each other, fostering links between them and providing a solid and coherent basis for carrying out joint work and projects in the future (Gabbe et al., 2000). In this context, ADAM research continues to appraise this participative and social learning process in terms of adaptive water management and adaptation to climate change while setting and mediating round tables and focus groups on climate change adaptation and water management.

IV. DISCUSSION AND CONCLUSION

The stakeholders consulted in this research perceived that the development of mechanisms that can ensure a fluent cooperation between administrative agencies of both countries and civil society is crucial to ensure an integrated planning of the whole Guadiana river basin (Adam Workshop, 2006). In this article we have argued that integrated adaptive management in this region needs not only to take into account water issues but also other policy domains such as tourism, agriculture and climate change, all of which finally affect water regimes and have related impacts on the whole regional ecosystem. However, policies and programmes that affect water demand often operate at scales other than the river basin, like Autonomous Communities in the case of Spain or regions in Portugal, the later with less power and competences than the former, this adding further complexity to the integration of objectives and associated responses. Therefore, the objectives for climate change adaptation and adaptive water management should be mainstreamed in accordance with the existing multi-level governance structures and fit into the appropriate and feasible scales of stakeholders' interaction: local, regional, river basin and national.

In the Guadiana river basin, some cooperation mechanisms like the CDAC have already been being active and constitute important instruments that help sharing information and achieving a certain degree of cooperation among actors of both sides of the border mainly on water issues. Nevertheless, we feel that stronger links could be established among those mechanisms and cross border structures promoted through the EU Territorial Objective, in particular Working Communities Andalusia-

Algarve and Andalusia- Alentejo. This could improve the distribution of responsibilities promoting coordination on other areas such as tourism, agriculture, transport and energy. Before the challenge of mainstreaming climate change in transboundary regional development, it is crucial to develop capacities to work in different domains at the same time while establishing links and engaging actors in common processes in a social learning mode

Nevertheless, at present, the priorities of cross-border co-operation are very often focused on transport infrastructures and concentrate on improving terrestrial, maritime, railway and air networks as well as other types of infrastructures related to industry (research and innovation centres) and energy (gas pipelines, power lines). While these strategies may have an impact in reducing the vulnerability of local populations to growing pressures derived by climate change (and in this regards can be seen as an adaptive strategy), of course this have a potentially very negative effect on mitigation efforts. If these priorities are not balanced and integrated in a sustainable development vision for Lower Guadiana that takes into account climate change considerations in the river basin, the outcome of these processes will create a blatant contradiction between the need to enhance the capacity of the whole system to respond to global change and the regional/local and short/ mid-term demands for adaptation and sustainable development. Mainstreaming sustainable development issues on other policies will finally depend on the political will and on the implication of actors sensitive to those considerations in the framework of the transboundary strategy in a multi-scale fashion.

Moreover, cross border arrangements are influenced by differences among the regions in terms of competencies and legal powers, differences in administrative cultures, language barriers and the still scant knowledge the major actors on either side of the border have of each other. In the case of the Spanish Portuguese frontier, we must add the very different socioeconomic conditions of each side. These elements pose additional obstacles for strategic and participative processes, even though they may also constitute an opportunity for enhancing social learning¹

It is likely that the Gabinete the Iniciativas Transfrontereras (GIT) will increasingly play a more central role in developing the desired institutional and social capacities that consolidate it as a bridge organization capable of leading a transition process that mobilizes civil society actors and coordinate governmental scales linking different domains and networks while taking into account with climate change and water management issues. If that is the case, it may complement the process started at the whole river basin level and overcome the mentioned barriers associated to the frontier effect, also in the domain of climate change.

Opportunities abound. As argued, structures based on networks are more flexible and retain the ability to adapt as problems change and new responses are learned. Lacking any hierarchical powers or means of implementation of its own, GIT depends on state, sub-state and private-sector actors to develop and implement its policies Ideas, rules and values associated to climate change and sustainable development have the potential to penetrate and circulate in an interactive way into these social structures more easily than in other more centralized and isolated ones, thus facilitating collective learning and relational capacities. Therefore, these “atypical” institutions -not totally governmental nor totally non-governmental but constituted by both- may constitute a unique framework to intro-

¹ Among the risks identified in the formation of these new organizations lay their capacity to sustain their activities during long enough periods of time as to meet their original transboundary cooperation goals or whether the main purpose is only to receive EU funds in the short term. In this regard, cross border cooperation and climate change constitute both opportunities in terms of receiving European funds that should be appraised accurately to prevent attitudes focused exclusively on obtaining subsidies.

duce ideas and policy considerations that shape political processes because of their territorial scope, their flexible structure based on networks and their capacity to intervene in several fields of action and regulatory areas. By establishing horizontal links among different domains (for instance, economic and regional development, energy, environmental protection, tourism and leisure, agriculture, to name a few), in this case, through the elaboration of participative transboundary actions, new capacities in both sides of the borders can be built. From this perspective, these structures are particularly suitable for mainstreaming climate change in the regional sustainable development strategies.

To sum up, the new types of atypical organizations constitute new forms of governance nexus, and can be seen as important examples of adaptive responses to a fast changing institutional and natural environment. They may also be able to better deliver their cooperation goals under the current fragmentation of decision-making power in Europe more in line with a model of relations based on plural decision-making processes and exchange of resources among the different actors, instead of a model based on strictly formal authority or legally traditional nation-state defined powers. However, the implications of the challenges and opportunities that presents the atypical institutional structure of an organisation such as the GIT so as to contribute to a transition to an adaptive management that deals both with water and climate change issues requires further research.

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