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The creation of adaptive governance to solve the water crisis: The case of Guanajuato

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ERSA – European Regional Science Association

Theme

Sustainability issues in regional development

The creation of Adaptive Governance institutions to solve the water crisis. The case of Guanajuato

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Abstract

The proposal is based on accepting the premise that says the water crisis is a crisis of governance. In this sense means that the problems relating to access to water and sanitation, soil degradation and depletion of aquatic ecosystems and aquifers or damage and risks are referred to shortcomings in resource management. institutions for the decision making. conflict resolution and coordination among stakeholders to create public action. In Mexico, highlights the case of Guanajuato from the local government has included among its strategies to build an institutional framework based on the paradigm of Integrated Water Resources Management (IWRM), from which it has tried to address the water crisis at the regional level seeking a local action, with social participation and including a long-term vision. What these institutions solve collective action problems from the perspective of adaptive governance? In other words, how affects this institutional arrangement the effective participation of stakeholders, promotes a common understanding of the problem, and get management objectives such as sustainability, equity and efficiency?

The creation of Adaptive Governance institutions to solve the water crisis. The case of Guanajuato

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Introduction

Water scarcity becomes the main obstacle to a sustainable future in arid areas. In Mexico, there is a naturally available water potential of 476 km³, with an average per capita natural availability of 4 505m³ (CNA 2006). The problem becomes apparent when one considers the geographical relationship to the interior of this country, and that while in the southeast are an average of close to natural availability m³/hab/año 13 290 (68%) in the center, north and northeast availability becomes natural m³/hab/año 1 835 (32%).

The problem is exacerbated when one considers that the ground water supply source is the most important-and often the only-in arid areas and major cities (Carabias and Landa 2005, 29).¹ About 35% of water used in Mexico is ground, which is supplied to two thirds of the population and one third of the irrigated acreage in the country.² About 35% of water used in Mexico is ground, which is supplied to two thirds of the population and one third of the irrigated acreage in the country. However, 653 of the country's 104 aquifers are overexploited.³

The status of groundwater availability becomes more problematic in regions of central, north and northeast because of weather, including drought increasingly constant in recent years, exacerbating the deficit situation of the extraction-recharge relationship. In addition, pollution from cities, industry and intensive agriculture fertilizers and pesticides lower quality water drawn from underground, making cleaning it difficult and expensive process.

¹ This regional comparison shows a more complicated scenario where it was identified that this relationship of natural water availability is a relationship contrasts with population and economic activity concentrated in the southeast where 23% of the population and 15% of Gross Domestic Product (GDP) and the joint region of central, northern and northeastern 77% of the population produces 85% of GDP (CNA 2006).

² The 69% (17.8 km³) of groundwater is used in agriculture, 25% (6.3 km³) in the public supply, and 6% (1.6 km³) in the industry supplied (Carabias and Landa 2005, 60).

³ It is considered that an aquifer is overexploited when extraction exceeds recharge at least 10% (Carabias and Landa 2005, 58).

The ecological, social, economic and political partners in this scenario are increasingly visible in these regions. Is an increasing conflict between different users associated at groundwater. The main manifestation is the conflict between the fields, industries and cities vying for the availability of the resource, where cities and private actors more economic and political weight are gaining ground and creating significant imbalances in the ecosystem and putting in threatening political stability, resource sustainability and sustainable development.

Within the process described above, at subnational level is interesting to highlight the case of Guanajuato. Of the regions that present water crisis scenarios expressed in shortage, this country's institution stands out not only by the gravity of the problem and its implications for sustainable development, but institutional design efforts that attempt to address explicitly to this situation with bodies and instruments of decentralized and participatory.

In Guanajuato, groundwater is the source of six out of seven liters consumed for all uses, but particularly for domestic use represents 99% for agricultural use 60% to 100% industrial. Of a total of 17,000 wells were withdrawing about 4,000 hm³ per year, estimated to exceed 1.200 hm³ renewable resource.⁴

But while the case of Guanajuato stands out for the strategies undertaken by local government, which have included the design of an institutional framework based on the paradigm of Integrated Water Resources Management (IWRM), from which it is attempted to address the water crisis at the regional level ensuring local action, with social participation and including a long-term vision.

How these institutions solve collective action problems from the perspective of adaptive governance? In other words, how this institutional arrangement affects effective participation of stakeholders, promoting a common understanding of the problem, and get management objectives such as sustainability, equity and efficiency? Precisely these questions guide this paper.

⁴ This deficit causes drawdowns from 2 to 3 meters per year, which has long been cause direct negative economic effects on agricultural production and subsidence problems mainly in urban areas of Irapuato and Salamanca (Foster, Garduño and Kemper 2005).

Adaptive Governance: a concept with use heuristic

The proposed analysis approach that is known as Adaptive Governance. The prospect can focus on what the authors call the second-order conflicts, those which are defined geographically integrated into a natural system —like a river, an aquifer, a dividing line of water, a basin— defined from a multiplicity of problems (i.e. about water quality, water supply and sanitation, habitat conservation, etc.), and include a variety of multiple actors, such as specialized authorities of different levels of government and stakeholders, usually users (Scholz and Stiftel 2005, 1).

Adaptive Governance, according to John T. Scholz and Bruce Stiftel, both researchers from Florida State University (USA), is the institutional configuration that solves the problems of collective action that occurs between different types of users around a natural system.

It is considered as a positive adaptive governance situation when a decision-making process that uses collaborative techniques in the field of conflict resolution between competing users on the water. This institutional configuration allows each one of those involved to win on their own preferences (at least satisfactory), while minimizing cost of negotiation, but it is emphasized that the resolution of conflicts within the human system is valuable only if it can be a sustainable use the field of the natural system.

Conflicts arise in a combination of situations that on one hand the tensions manifest in human or social system based on different needs, interests and visions of the actors, while the conditions of pressure on the natural system in which seeks to solve problems on issues that commonly occur and sometimes unexpected unfamiliar, that is, requiring different levels of adaptation to new situations (Scholz and Stiftel 2005, 3). Frequently have new actors who do not know the procedures established by government, who change existing policies and establish new procedures on an ongoing basis. There are also disputes between authorities from the ambiguity of the arenas where conflict resolution, policies are coordinated across different levels that produce certain benefits for certain stakeholders who come together to affect the decisions of the specialized authorities, interest groups up networks of experts, officials and representatives of users, and these networks often are not part of any formal government structure of water resources. The complexity of the problems around water requires complex tools to solve them.

Policymakers need to base its action on alternative bases : Make converge to major users, experts, authorities and organized interests in specialized trading schemes to help achieve mutually beneficial arrangements while ensuring the sustainability of the resource, namely, under a scheme of Adaptive Governance.

An Adaptive Governance “involves the evolution of new governance institutions capable of generating long-term, sustainable policy solutions, to wicked problems through coordinated efforts involving previously independent systems of users, knowledge, authorities and organized interests” (Scholz and Stiffler 2005, 5).

Achieving a successful governance of water depends on the ability to create adaptive institutions. This type of institutional framework can resolve the following challenges:

1. Representation. The institutions must effectively represent those involved, reflecting their preferences and interests fully.
2. Decision process. Preferences and interests of the actors involved have the potential to become public policy, through a process that enables a consensus.
3. Scientific Learning. Scientific knowledge is incorporated to create viable policy options, mechanisms for monitoring and impact assessment. Displays science as a social process and not as a static set of skills.
4. Public Learning. Scientific development becomes public understanding to convince users to meet new rules, facilitate the support of agreed arrangements between officials, policy makers and users.
5. Problem Responsiveness. The human system is in equilibrium with the natural system (sustainability). It also improved in terms of efficiency and equity on the *status quo*.

Water management in Mexico

In Mexico, the government has introduced a new water policy, triggered by the need to resolve the water crisis, namely the strong imbalance between the demand and the availability of freshwater, as a result of the means of management and use of water resources that Mexican society has been doing and that seen in the forms of control, ownership and enjoyment of water that social groups have been exercising, and generally not taken into account the sustainable management of resources. So, with this urgency, the

Mexican government has adopted a new policy, since it requires finding new strategies and policies that can address the enormous challenge facing the water resources available in volume and quality for the various human uses and different users and keep them for future generations.

This new water policy has been the decentralization of administration and control of water, concrete in the transfer of management of water resources of the federal government to state governments, municipalities and even to the end users; policy that has led to struggles and negotiations over water.

The National Water Commission (CNA), which is the federal agency responsible for supervision and administration of water, took as one of its main lines of the decentralization of its functions and established three lines of work, which involves: 1) Improve the use of water resources, 2) Managing water efficiently and 3) Streamline the organizational structure of the sector. Just after that last line sets up a process of decentralization of sector responsibilities, seeking to increase the participation of the three levels of government and water users in planning, through the creation of the Basin Council (Castelan 1999, 2).

The federal government recognizing the importance of incorporating a regional or basin for better planning, use and distribution of water, the operation of thirteen proposed Basin Council, under the model of IWRM, based on the consideration that the water resource in their handling and management may not be limited to the political-administrative borders of municipalities and states. Basin Councils are created with the intention that they implement management plans, develop water infrastructure and preserve the environment. These thirteen Basin Councils correspond to the regional division established by CNA based on the natural watershed and the first runs were the Lerma-Chapala Basin, the Rio Grande Basin and Valley of Mexico Basin.⁵

Furthermore, in the case of water management for agriculture, since 1989 the Mexican government began to gradually transfer to the Users Associations Agricultural Irrigation Districts the responsibility of water management and distribution of irrigation canals and intakes after rehabilitation by the federal government. Irrigation Districts were divided into

⁵ Watershed Councils are made up of Regional Committees of users of irrigation, industrial, for service providers, by farmers, by business and suppliers.

modules to facilitate the delivery and distribution of water, and each module is an association of users, which should consist of all users who are supplied with irrigation water from one main channel, not regardless of the type of land tenure. The program of transfer of these irrigation districts to the users has been recognized as an effort in decentralization programs at the federal level.⁶

It should be noted that other significant changes made by the Mexican government in hydro-agricultural policy with the promulgation of a new National Water Law (LAN 1992) in which foresees the participation of private investment in the construction and operation water infrastructure, the obligation of all users to charges for domestic water use and wastewater discharges. The Act maintains the principle that the use or exploitation of national waters should be done only through concessions and the creation of a public register of water rights, which must register the securities and granting permits and allocation, and transfer operations and the issuance of certificates.⁷

With respect to the paradigm of IWRM and management of watersheds has been adopted by the Mexican government, we can say that this is a resource management model that aims to be decentralized. Institutionally, the base is the creation of basin councils, which are shown as forums for consultation and coordination, as territorial demarcation is the geographical area covered by the benefit of the waters of one or more hydrological basins or sub-interconnected, and involving representatives of the federal government, states and municipalities, and representatives of different users, in sum, is shown as an agency through which to seek the involvement of society in the planning and management of water resources.⁸

However, in trying to locate the action of these tips as areas to solve water conflicts among different users and levels of government, in reality there are many substantial problems, since these agencies have not been endowed with a clear structure authority, and have only

⁶ It should be noted that the country has 80 irrigation districts (each with more than 3000 ha) covering approximately 60% of the total irrigated area and are served by an irrigation system itself. These districts are divided in turn into irrigation units that are built by users organized into Civil Associations.

⁷ The transfer of title provision is limited to operations within a single watershed or a single aquifer, and that it undertakes to maintain the point of abstraction and the download site.

⁸ The National Water Act provides for the establishment of Watershed Councils in order to coordinate water policies and programs among the three levels of government in Mexico: Federal, State and City and to promote consultation of objectives, goals, strategies, policies, programs, projects and actions between federal authority and water users with proper credentials (Castelan 1999, 3).

been empowered only to issue recommendations to government bodies and users, but do not have authority to issue any official regulations or bring legal action or legal person and not a substitute to any authority or organization, which have been limited in their functions.

These limitations will undoubtedly affect their operation and their ability to carry out a real decentralization of water management and to resolve conflicts over water between states of the Mexican Republic, at the regional level and between locations, and make society truly participate in making decisions about the resource.

Regulation of the National Water Act (LAN) in 1994 defined the integration of the Basin Council, unfortunately with a heavy presence of government (Torregrosa 2006). But it was not until 1997 when the CNA embarked on a reform of the regulation itself, reducing the government presence in the Basin Council, and facilitating the establishment of subsidiary bodies at the level of sub-basin, watershed and aquifer, respectively called Basin Commissions, Committees Watershed and Groundwater Technical Committees (COTAS) (Dourojeanni et al. 2002, 57; Marañón and Wester 2000, 8).

Guanajuato represented from the beginning an advanced case of the constitution of the COTAS. In this entity, in November 1997, created the first two levels of the country: Celaya and the Laguna Seca.⁹ The experience of Guanajuato was driven by the government of that state, raising differences with respect to the nature, objectives and scope of CNA COTAS subsequently driven in the national order.

The particular history of Guanajuato is being analyzed and evaluated in the following.

The case of Guanajuato

The Guanajuato state government address the crisis of water, through its agency for control and management of water, called the State Water Commission (Comisión Estatal del Agua de Guanajuato - CEAG) has assumed the IWRM model and has established itself as one of their main lines work of social management of water, through the responsible participation of the three levels of government and the various water users in the management of water resources in its territory.

⁹ Queretaro followed these two, for in February 1998 established the Technical Committee on Groundwater Aquifer Valle de Querétaro, AC; between 1998 and 1999 Baja California Sur advanced significantly in the establish five COTAS. At April 16, 2007 were 69 are COTAS installed around the country (CNA 2007).

Thus, one of the main objectives of the CEAG has been achieved and co participatory management and restore balance to ensure availability and demand, and the efficient allocation of water in public and productive uses. To accomplish this, since 1997 propelled the creation of their own COTAS, organizations comprised of the different types of users (agricultural, industrial, trade and services), which are based on the territorial water areas (which were defined for study and management purposes in the State of Guanajuato), as it left the watershed approach and bearing zones for the definition of actions to restore balance in the use of resources.

Unlike the proposal by the ANC, it was decided to call these user organizations "Consejos Técnicos de Aguas" (Technical of Water Councils) to build the acronym COTAS and facilitate their recognition in the Basin Council. But this peculiarity of the name goes beyond that simple fact, but in Guanajuato raised the need for its COTAS have certain characteristics that the proposal for the federal agency did not have.

According to the seminal study of Boris Marañón (1999, 165), the CEAG designed its COTAS with the intention that these organizations in addition to being only composed of users, should be local management bodies, aimed at regulating, monitoring and conservation water. Without becoming authorities (to the extent that it prohibits the LAN) or single intervening with the government, should be ancillary to the authority, both federal and state and local level, water regulation. Also, through consensus had to look forward actions and regulations and ensure performance.

The function assigned to the COTAS of Guanajuato to go beyond mere consultation is through its integration into the State System Planning and Water Management from which can contribute to the development of actions and strategies for stabilizing the aquifer and to propose specific infrastructure projects.

CEAG also promoted the creation of the State Water Council (CEH by its Spanish acronym) as a body representative of the COTAS and installed irrigation districts in the territory of the state, which has been significantly involved in the Basin Council of Lerma-Chapala, the belongs to Guanajuato and is one of the Councils promoted by the Federal Government to conduct a policy of integrated water management by catchment area. Basin Council has raised the need to recover the regional water balance and determine reasonable

allocations to ensure the sustainability of economic development and population of the entities that are part of the basin.¹⁰ It should be mentioned that the CEH has strengthened the organization of users at the state and has strongly defended their interests at Basin Council of Lerma-Chapala.

But it should be noted that the Basin Council of Lerma-Chapala formed to ensure an equitable distribution of water from the watershed and environmental protection, has been at times develop processes to achieve consensus among the various governments and users, such has been the case of the Coordination Agreement for the Availability and Distribution of surface waters signed in August 1991 and amended in 2005, which put an end to disputes over water between farmers of Guanajuato and Jalisco, by eliminating the set of transfers that were made of the dams at Lake Chapala Guanajuato and met the conditions of granting titles of Guanajuato farmers and the producers guaranteed at least 50% of water concession for agricultural use in drought years.

With regard to COTAS, these are organizations that have sought to promote the organization and participation of users of groundwater and surface water in the comprehensive management of the resource, to schedule and propose alternatives for sustainable water management, primarily to achieve reductions The depletion of the aquifers through specific actions targeted at increasing water use efficiency in all sectors through social consensus and the development and implementation of regulations of aquifers.

Currently there are 14 COTAS, which constituted civil associations relying on a technical management, supported by the CEAG, which through its Directorate General for Social helped them in their operation, providing counseling and training, promoting bonding and user commitment in addressing water problems. As a result of linking public sector users have come to 8.610 COTAS users. In addition, CEAG has also financially supported especially in its beginnings (2000 to 2004) with the creation of the Trust for Social Participation in Water Management (Fideicomiso para la Participación Social en el Manejo del Agua - FIPASMA). They are now receiving financial support from the World Bank through the implementation of concrete projects.

¹⁰ That's five sub-national entities: Estado de México, Querétaro, Guanajuato, Michoacán and Jalisco.

With these organizations, the state government wanted to ensure social participation in water management, and thus a more efficient water management, creating an interesting social process of water management in the state, effectively the creation of these organizations began a process of social management, as it called on the various users to participate in these committees, and they did begin to operate and continue operating, different experiences being raised in the process of social participation in the management of a natural resource that previously was the responsibility of subnational entity.

The system was completed with hydrological information not only from each of the 14 subregions that are divided into territories for the formation of COTAS, but socioeconomic and geographical. The idea was not only stay with the hydrological diagnoses, but from them they should be given continuity through monitoring of key data, feeding continuously changing dynamic variables, both natural and social, from the application of mathematical models for exploration (CEAG 2006, 19).¹¹ This created the State Information System (Sistema Estatal de Información - SEIA) and began to operate a Water Documentation Centre which was made available to all interested public.¹²

The information system as a whole was vital to articulate the State Water Plan (Plan Estatal Hidráulico - PEH), but to try to integrate a state-based water planning that worked permanently in Guanajuato which could appear before the federal government agencies (CNA and Basin Council of Lerma-Chapala) with a clear idea about what you are most suited in water.

The PEH 2000-2020 was presented publicly in the Water Expo 2000, this document reveals the following general policies for the state of Guanajuato (CEAG 2006, 19):

- Water was recognized as a critical element for social welfare, economic development and preservation of natural environment in the state of Guanajuato, and the fundamental right of its people to have a minimum allocation quantity, quality and opportunity, a framework of social equity and environmental sustainability.

¹¹ Also worked with the operating agencies of water service and wastewater in municipalities, from whom information was collected bimonthly from management indicators. And in 12 municipal discharge diagnoses were made and wastewater use. In the dams was applied studies of vision and bathymetry, as well as special studies for Tamascatio Creek watershed and the Rio Turbio (CEAG 2006, 20).

¹² See the SEIA web portal: <http://seia.guanajuato.gob.mx/index.html> (available June 23, 2009).

- The planning and water management would be based on watershed approach and areas of groundwater management for the definition of actions to restore balance in the use of resources.
- The need to manage and direct the water management in terms of national development objectives, consistent with the conditions and state goals, as part of an integrated sustainable use, in a context of interstate coordination and consensus-effective, within the Basin Council and with the support of the CNA.
- Actions have a broadly participatory, in which the three levels of government support will serve as supportive and alternative social structures.
- The allocation of financial resources would respond to a ranking based on economic and social benefit, vertical and horizontal equity, as well as the conditions that ensure a sustainable operation of projects.

The task was completed organizational restructuring in parallel with the creation of the Directorate of Social Management is that structured the work of creating COTAS and CEH, key parts of the Structure of Planning and Water Management of Guanajuato.

While this process may seem good for Guanajuato, were also presented enormous difficulties and resistances of various kinds.

For example, the reform project was completed with the approval of the Water Law of the State of Guanajuato (Ley de Aguas del Estado de Guanajuato) - LAEG) in May 2000. This separate project to support both the new structure and the roles and strategies that the CEAG been playing recent time ago and gave new shape and vitality to the facts of this government agency, also sought to reach a definition of state water policy that no had been achieved before in terms of integrated water management.

The original draft of the LAEG, before final approval, was based on four axes (RSM 2008):

- 1) *Knowledge*. Which means you always know about how much water is in the state? Knowing the availability in dams, rivers and streams, the balance of water areas, the location of uses.
- 2) *Administrative Adjustment*. It is the definition of how much water is allocated or concession, where and to whom; verify compliance with the terms of the

assignment title; regulate groundwater extraction and regulate transfers of land use rights or relocation. While this is a unique feature of the federation, the state must contribute and collaborate in this task.

- 3) *The organization of users*. The implication from the dissemination of information to creating awareness and promoting a new attitude towards resource management, legislation should encourage self-commitment of users, the possibility of rebuilding social arrangements to ensure orderly access the use of a common resource.
- 4) *Rationalization in the use of water*. The legislation should encourage reductions extraction through economic mechanisms that were changing the production structure of the state and consumption patterns for all uses .

However, after review of the CNA and the dispute with local legislators pass a law deicide much more limited in scope in relation to the axes two and four, it was considered that if he is granted the authority State capacity in this regard, we would be passing a law unconstitutional and overreaching in its functions.

In the concurring opinion of two officers directly involved in this process (RSM 2008 and ERB 2008), while CNA and local legislators at that time failed to understand that the proposal was to replace the functions of the federal agency in the state, but to enable the state agency for cooperation and collaboration expresses it in achieving the objectives of integrated management of water resources.

Despite this situation, the LAEG (2000) includes the basic approach to frame the activity of social planning and water management are the basis of the new direction the agency responsible for water policy in the state took over from previous years. The CEAG bestowed the following attributes:

- I.- Regulate the planning, management, conservation and preservation of the waters of state jurisdiction, to achieve a sustainable development, and
- II.- Establish the general guidelines for municipalities to provide the drinking water utility, drainage, sewage treatment and disposal of wastewater.¹³

¹³ See LEAG (2000).

The definition of "state waters" is the point that continues to cause more controversy among the actors involved, as the federal constitution sets out in Article 27 shall be considered the national waters, but on the other hand talks of the waters not included in this list which are part, he says: "of the land through which they flow or in which their deposits are". And clarifying that: "if those waters are located in two or more properties, the use of these waters are considered public interest and became subject to the laws enacted by the states" (Constitution of the United Mexican States, Article 27). It is the function of this work to try to clarify this controversy, but simply point out that the way of writing such attribution is caused dispute between local and national stakeholders.

The importance of the first assignment is leaving open the possibility that the action of the CEAG not limited to a single sector, as it could be that of water, sewer or sanitation, —the 1991 Act limited the powers themselves to this last field —, but lays the foundation for this body to obtain the integrated water management, and tools for an incremental process of decentralization through participatory planning and management. However, given the limited reform, the possibility of seeking integrated water management at the mercy of the will of the rulers in turn, the continuity that could be given to both professional work within the unit responsible for sector, as well as support for the structure of social participation.

During the 2000-2006 government period, the orientation of the CEAG would remain the design of a state water policy to try to cover several sectors of water management by making this agency a coordinating body for efforts of other government agencies were related to water issues (i.e. Ministry of Agriculture and Rural Development, Ministry of Ecology and agencies service operators of drinking water), generator and provider of information and promoter of user participation through COTAS.

However, the ambiguity with LAEG left the allocation of the CEAG to ensure IWRM approach has brought a new government (for the period 2006-2012) to return to a policy direction of sectorial water management in Guanajuato. The new Technical Secretary of the CEAG has decided to put less emphasis on planning and information generation, and return to be a priority for the construction of public works and guidance 'return' to focus with greater emphasis on the second award given by the LAEG, namely, the focus on operators

of water bodies in the municipalities. That is, a focus in an orientation of the supply of water, not in demand management.

On the other hand, have focused again on decisions about agricultural water use —the largest consumer of resource— in the Ministry of Agriculture and Rural Development, and the task of cleaning up polluted water by industry in collaboration CNA with municipalities.

The priorities are clear for the new CEAG management: creating 'efficient' to increase the availability of water (i.e. strengthening the dam project The Zapotillo which aims to transfer water from this region of Jalisco to the city of Leon, Guanajuato), to achieve competitive rates and not interfere with water management is considered the exclusive power of the CNA (RSM 2008 and RVG 2008).

Final considerations from Adaptive Governance Approach

With these institutional arrangements the Guanajuato state government wanted to achieve a water management scheme in social participation and thus a more efficient water management. Indeed the creation of these institutions began a process of social management, as they tried to call other users to participate and be able to operate under a new scheme, undoubtedly. Various experiments have been initiated in the process of social participation in the management of a natural resource that previously was handled by the national authority.

However, analyzing the social processes of water management in Guanajuato from the perspective of adaptive governance is possible to identify some positive aspects, but also some shortcomings and problems that prevent these processes get deployed to ensure effective institutions to develop and ensure ecosystem integrity with an equitable distribution of resources among different users.

Representation

Indeed, more and more users involved in the search for solutions to the problems of the aquifers of Guanajuato, an important fact to note is that in 2003 the COTAS involving about 10% of registered users, and for 2006 and represented nearly 35% (CEAG 2006).

The COTAS are the main difficulties in: achieving financial self-sufficiency and thus their full autonomy, as they depended on the initial stage of the public subsidy granted them

CEAG, and now depend on financial assistance afforded them by the World Bank cover administration costs, which leads them to submit programs and meet goals set by these other actors. In such a way that COTAS are also subject to the provision of government authorities regarding recognition agreements, guidelines and practices that these organizations proposed for sustainable water management.

In addition, another major problem that these committees have had concerns that there is a balanced representation of different water users, many of them are given more weight by the representatives of industrial uses, urban and services that use agriculture, where the latter are the most resource consuming. Inside the COTAS are representatives of different interests and different bargaining power, ranging from representatives of transnational corporations, local businesses, farmers, associations of small agricultural producers, to operators of water bodies, which obstructs difficult to search and implementation of actions that tend to really sustainable water management.

As can be seen in these institutions there is effective representation, do not include all users, all the interests involved, which means that not all interests are reflected in the strategies and actions to deliver better and make management sustainable resource, and this obstructs the existence of genuine participation of all stakeholders in the decision making process.

Although it should be noted that the CEAG has expressed interest in increasing the representation of the various water users, especially small farmers in the agricultural sector.

Decision process

Another major difficulties encountered by the dimensions in Guanajuato has been not been given legal authority by the CNA to enforce its agreements and sanctions, so that their actions can not contribute significantly to the reduction extractions of groundwater. Many users complain of this limitation and lack of political will on the part of federal agency officials to delegate functions and decision-making capacity to COTAS to address water problems.

It is clear that the political authorities of other orders of government are not convinced by strengthening the legitimacy of the new institutions. In large part this is due to fear on the

part of the political class that people take part in decisions, where there really social participation in the design and implementation of public policies.

It is also important to note that the way these committees operate and their results vary between them, because their operation depends critically on the ability of planning and management have their own managers, so the results are varied, some of them have implemented a series of actions that have had positive effects to increase the registration of the number of uses, to monitor the volumes of water extracted, awareness among users about the proper use of their extraction volumes, train for taking readings on their extractions, place meters on their wells, contribute to the water supply to rural populations, assist in the management of some services to the users who benefit by being interested in the actions that the COTAS and therefore interested in participating, while others are more difficult to undertake projects and achieve positive results, many of them complain about the little interest shown by users to participate in the COTAS, and especially the commitment to assume responsibility and take part in the collective action.

Scientific Learning

Unless that is done from the CEAG in terms of daily hydrological data generation, a major drawback is the lack of collaboration between scientists, government and users. There aren't significant contributions to scientific research generated in the state in the planning process to determine strategies and actions to manage aquifers. Is minimal, from academic or government itself against the development of specific research on the problem of water in Guanajuato and its impact for designing future policies.

Public Learning

It now has a space to reach consensus among users, however, this is not crucial for users to publish their preferences, and therefore they do not reflect public policies or strategies. However, it has been carried out by users and support actions aimed at integrating and verification of water use, the development of regulations for water extraction, to the promotion of practices for the efficient use of resources through technical assistance, to the completion of a water monitoring process, and is finally getting a greater awareness of the problem of water by users.

But it requires the permanent guidance, which promote professional training and to assist in the implementation of strategies. Similarly we see that there is insufficient conviction of all users to submit to the new rules, especially when it comes to comply with the limits for water use because many users continue to evade the rules and extract large volumes of water for their productive activities, particularly some farmers, those with more economic capabilities.

Problem Responsiveness

It is clear that even this institutional framework has been unable to achieve their main objective, we mean by reducing the depletion of the aquifers through proposing and implementing alternative sustainable resource management.

However, the importance and value of these institutions is based on the idea that social participation of various public and private stakeholders is considered key for changes on the responsible use of a natural resource vital for development; they are relevant for building Adaptive Governance conditions.

Indeed, these new organizations have already begun to establish a new relationship between state and society, in which the first has started to delegate tasks and responsibilities in the care of a serious social problem in the region, the local crisis expressed in shortage of water. The social partners have already begun to take responsibility and even greater potential for influence demand.

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