

Community Water Management in Latin America and the Caribbean: Challenges for Mexico

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Abstract

There are about 80 000 Community Water Boards (CWB) operating in Latin America and the Caribbean (LAC), showing that community management is an alternative to supply water and sanitation services, primarily in rural areas. In Mexico, this form of management is latent but has not been subject to a consolidated recognition. The descriptive documentary research analyzes community management models applied in LAC countries according to the categories described in the Triple-S Model (Sustainable Services at Scale), to interpret its structure according to the particularities of the different levels of government (local, regional and national) it is concluded with challenges and opportunities of a federal state, such as Mexico, for the implementation of community water management.

Keywords: community water management in Latin America and the Caribbean, community water management in Mexico, community water management models

1. Introduction

Community-based water management arises from the initiative to self-supply water to its inhabitants, mainly in rural areas of developing countries, due to their marginalization or inaccessible settlement conditions (Organization for Economic Co-operation and Development [OECD], 2013). In LAC is estimated that there are 80 000 CWB providing services to over 40 million people (Fundación AVINA, 2011). Regarding Mexico, Article 4 of the Constitution establishes the responsibility of the state to guarantee the access to water and sanitation services for the entire population (Constitución Política de los Estados Unidos Mexicanos, 2014). However, this is not fully accomplished despite the fact that there are strategies to support rural supply (Comisión Nacional del Agua, 2014; Comisión Nacional del Agua, 2013) and literature is not vast when analyzing cases of water management as experiences from the perspective of public administration.

The main objective of this paper is to present challenges and opportunities for the promotion of community-based water management in Mexico, considering his form and order of government. To this end, this paper analyzes some initiatives to support community management of water in LAC that arise from local, regional or national institutional arrangements that have been consolidated as models, adopting the form of public-community, public-private, private-community or mixed alliances. The analytical categories used are the differences in institutional and normative order; the functions of public institutions related to the management of public services; and in the strategies to support community management deployed in each country (Bernal, Rivas, & Peña, 2014).

2. Community-based Water Management and Sanitation

Community management of natural resources is the main object of study under the theory of communal resources or "commons" (Ostrom, 1990; Hess, 2008) and it is justified by the need to manage common property of a population subject to an action collective (Ostrom, 1990; Ray, 2014). Moreover, the interactions for collective action amongst stakeholders and the surrounding environment have been studied under an analytical framework called Social – Ecological Systems (SES) (Ostrom, 2009; Poteete, Janssen, & Ostrom, 2010); and Community-based management of water also has been analyzed as a management phenomenon described by authors such as Shaw and Thaitakoo (2010), Aguilar (2011) and the OECD (2013), among others. As an emergent

structure of social organization where the professional providers are not interested to work in, while its implementation has extensive empirical evidence globally (Woolcock 1998; Narayan & Pritchett, 1999; Binswanger-Mkhize, de Regt, & Spector, 2010; Rosensweig & Kopitopoulos, 2010; Lockwood & Smits, 2011). According to these studies, it is possible to affirm that community-based management of water exists in both urban and rural areas and occurs in all social groups, but it is most common among vulnerable population.

Communities meet by their own initiative starting from local alliances or incentives created by the programs of access to water and sanitation, in order to improve their access to water, but very often, these communities have a lack of capacities to be sustainable in the long term, and to provide drinking water quality (Ampuero, Faysse, & Quiroz, 2007). Four different approaches to support community management have been identified: i) self-management and self-regulation, which aims to deregulate and allow rural communities manage their water resources by their own judgment, based on local capacities and inveterate traditions of the people (Palerm & Martínez, 2009); ii) operations at scale, which drives to operate systems under economies of scale (Ferro & Lentini, 2010); iii) capacity development, which strengthens capabilities of community leaders to improve the delivery service (Chaves & García, 2009), and iv) co-management, which leaves the operation and management of services in charge of the communities, but which in turn stimulates the responsibility of other levels of government (municipal, regional or national) in the development of public policies, regulation and management guidelines (Carlssona & Berkesb, 2005).

Beyond the co-management approach, LAC governments have identified that supportive actions to community-based management improve the sustainability and service delivery where they are implemented, and some of them will be presented later, remarking that there is not yet enough evidence to analyze the impact of these programs, due to their recent development and scarce documentation. Therefore, the institutional support to CWB and their second-level associations have been shaped to the legal and institutional context, adopting three basic types of alliances: i) public-community partnerships, ii) public-private partnerships and iii) private-community partnerships: depending on the stakeholders that are participating in the arrangements. However, an established agreement is needed to guarantee the flow of technical and financial resources to any of these alliances.

In addition, there are emerging second-level associations of community water boards, of regional and national nature, as inter-community networks, that seek recognition and political incidence to increase the support for community water management, for example the organizations AQUACOL in Colombia, FEDECAAS and FENCOPAS in Bolivia, AHJASA in Honduras, among others. Moreover, community management has been recognized by non-governmental, multilateral organizations and cooperation agencies as CONSORTIUM CAMAREN in Ecuador of strengthening of capacities; Bolivia's AGUATUYA initiative to form management networks of knowledge; and the Unified Program of Capacity Strengthening (Fundación AVINA, 2012).

Triple-S Model of Lockwood and Smits (2011) is a theoretical reference to illustrate how the different cases of each analyzed country must be interpreted in the light of its structure at different levels of government (local, regional and national) focuses on service supply considering the infrastructure and systems or means to provide it. These authors analyzed the community water management phenomena in 13 countries with different systems of government and economic levels, such as Honduras, South Africa, India, the United States, among others. The results show general categories in a number of institutional levels (local, regional and national) depending on the degree of decentralization and specific administrative hierarchy of a country: a) national level: policies and normative functions; b) intermediate level: service authority functions, and c) local level: functions of the service provider. This hypothetical model is valuable reference, but should be detailed and adapted to the country where is applied, to guide proposals of functional interaction arrangements, according the institutional and legal framework.

3. Models of Community Water Management in LAC

3.1 Bolivia: Model of Community Development and Institutional Strengthening (DESCOM-FI)

Bolivia is a decentralized unitary state and its Constitution recognizes the right to water and sanitation as a human right that must be guaranteed by the state. In addition, The Law of Potable Water and Sewerage establishes sectoral institutionality in charge of municipal governments in a direct way or through a Provider Entity, where technical assistance and institutional strengthening is given with several programs and projects (Rojas, 2014).

The DESCOM-FI guideline (community development and institutional strengthen), drive to conform a committee responsible for the project, consisting by the municipal government, service operators institutions for water and sanitation and rural population. The DESCOM-FI is based on the life cycle of a project, incorporating

the specific requirements of the procedures for public resources investment in Bolivia, focusing on the stages of financing. It also considers categories of institutional strengthening, technical assistance and participation mechanisms enhancing coordination between communities, municipalities and the state (Fondo Nacional de Inversión Productiva y Social, 2009).

The DESCOM-FI model works as a public-community alliance, allowing the execution of public budget on behalf of the associations of water boards.

3.2 Brazil: Model the Integrated System for Water Supply and Sanitation (SISAR)

Brazil is a Federal state with regulatory autonomy in the states. With the promulgation of Law 11.445 / 2007 the institutionalization of sectoral legal framework at the federal level, was produced. Statewide, the Sanitation Law determines the obligation of municipalities to carry out this management and in the indigenous communities, the responsibility rests within the Ministry of Health. (Rojas, 2014).

The SISAR model emerged in 1995, supported by the World Bank and Kreditanstalt für Wiederaufbau, and has been implemented in the states of Ceará and Bahia. The SISAR model allows technical, administrative and social support, to the water boards that accept to be part of this strategy. The categories of the model are: a) social work with local user groups; b) definition and the strengthening of the institutional structure; c) application of technical measures standards, and d) ensuring financial sustainability.

The obtained results are the access to water supply of reliable quality to more than 13% of the rural population of the state of Ceará, being that 128 of the 180 municipalities in Ceará with 330 000 inhabitants from over 560 small and medium-sized communities, have implemented the model. The model has only recently begun operating also in Bahia and Piauí. The advantage is the state support in Ceará, coordinated effectively with the communities and external institutions. Nevertheless, there is still no evidence of its implementation in all the states (Meleg, 2011).

3.3 Colombia: AQUACOL Model

Colombia is a decentralized unitary state, which has not yet raised the human right to water due to its constitutional lag. However, access to water is protected by connexity by the rights to life and health and organized communities are empowered to deliver public services, under Article 365 of the Constitution. The Public Utilities Law (Law 142 of 1994) defines two categories of operators: i) companies, that can be public, private or mixed, and; ii) authorized organizations, which may be communities. There is a specialized water and sanitation regulatory body, known as Water Regulatory Commission (CRA). The Public Utilities Superintendency exercises surveillance and control over all operators and manages an unified information system (SUI) (Rojas, 2014).

According to the public policy for access to water and sanitation in rural areas, issued on the CONPES Document 3810 of 2014, in the rural areas inhabits the 23.8% of the Colombian population, equivalent of 11.2 million inhabitants and in these areas, where the supply of potable water and sanitation is done mostly by 11 552 community aqueducts (Consejo Nacional de Política Económica y Social, 2014).

AQUACOL is an association of CWB that brings together 33 communities of the departments of Cauca and Valley of Cauca, located at the south of the country, and this associative model has been widely documented in the scientific literature for its contributions to the post-construction support strategies (Chaves & García, 2009; Rojas, Tamayo, & Garcia, 2011; Smits et al, 2012). In AQUACOL, the community-based organizations join efforts and resources to provide themselves with technical assistance and community strengthening. AQUACOL, as a moral person, has managed alliances with various international organizations like the United Nations Development Programme (UNDP); the United Nations Children's Fund (UNICEF); the Superintendency of Residential Public Services; the Center for Research on Water Resources of the Universidad del Valle (CINARA) among others. However, its presence is still regional and they face financial and operational difficulties to expand their influence.

3.4 Ecuador: ROSCGAE Model/ CENAGRAP Case

Ecuador is a decentralized unitary state. The human right to water and sanitation is part of the constitutional order and in 2014 the Special Law of Water and Sanitation was enacted, which specifically recognizes community organizations as operators of these services and encourages public-community alliances as a management strategy, promoting the participation of representatives of municipalities in the water boards.

In Ecuador, there is also the institutional level of decentralized autonomous governments rural parish, representatives of municipalities for managing Rural Affairs (Rojas, 2014). Likewise, community management

has been strengthened through associations of CWB supported by nongovernmental organizations (NGOs). However, there is not yet a unified model for community water management, but stand out successful regional experiences such as CENAGRAP, which is an initiative of regional water management located in the province of Azuay, Canar Municipality, where the communities work together for technical assistance and institutional strengthening (PROTOS-CEDIR, 2011).

3.5 Honduras: AGUASAN Model

Honduras is a decentralized unitary state, which has declared the human right to water as constitutional. The General Water Law establishes regulations for this management by the state and the Law of Municipalities, delegating municipalities for this management, with joint actions between the Municipality, the service provider and the supports to the technical assistance (Rojas, 2014).

The National Autonomous Service of Aqueducts and Sewerage (SANAA) transferred the provision of the services to the municipalities that coordinate with the Water Boards. In the 80s, a strategy was implemented for accompanying the rural supplying, nationally, that became known as Technicians of Assistance (TAS) and Technicians of Operation and Maintenance (TOM) coordinated by SANAA, which today do not operate for lack of resources to continue with the strategy (López, 2011).

The AGUASAN model is an initiative of the Swiss Agency for Development and Cooperation (SDC) implemented since 2003 with different stages of evolution, starting with alliances at the municipal level. In 2013, the AGUASAN model was consolidated through the alliance with the ERSAPS (Regulator Water and Sanitation Entities), sponsoring infrastructure construction with a strategy to support community management, which has had a particular regional impact in the region of Intibuca and Progreso, in the south of the country. The categories of the model involve institutional strengthening, community participation, technical assistance and consideration of environmental aspects, which allow the beneficiary to own their own system and participate in the decision-making (Cooperación Suiza en América Central, 2014). However, being a model of external support, institutions and communities of a country should coordinate with this agency, considering limited capabilities.

3.6 Honduras: AHJASA Model

The Honduran Association of Boards of Water and Sanitation (AHJASA) emerges as a regional initiative in the north of the country, to provide services of strengthening and accompaniment in technical assistance and the management, to cover the activities run by the TAS and TOM strategy. AHJASA receives support from multilateral organizations, international cooperation agencies and contributions from associated communities to develop investment projects and implement its strengthening strategies.

This strategy has been widely deployed in the region of San Pedro Sula, in north of the country. In particular, AHJASA is distinguished by exercising the functions of technical assistance and management training through "the circuit - riders" that are technicians or promoters who work directly with communities, visiting them on a motorcycle and delivering the supplies needed for the operation, which are acquired and distributed through specialty stores called "water banks". The support offered supports additionally the provision through individual solutions in the dispersed rural housing. The "circuit-riders" strategy is sponsored by the Latin America Program and the Circuit Rider Program (Millennium Water Alliance, 2014).

3.7 Paraguay: Model: ÑAMOMBARETE and ME'ÊHÀRAPE

Paraguay is a centralized unitary state that exercises the ownership of the water and sanitation services, coordinating the activities amongst government agencies. Approximately 2500 sanitation boards have their respective regulations and provide services in rural areas and in some small towns. The regulation of Law 1614 gives the possibility to carry out the supervision and control actions based on an annual program of supervision of sanitation boards. In 2009 the Project for Potable Water and Sanitation, was approved, aiming at expanding the coverage of drinking water in rural areas (Rojas, 2014). Additionally, there are programs such as the Potable Water and Basic Sanitation for Rural and Indigenous Communities which is part of the strategy of the Paraguayan government and has benefited 57 693 inhabitants (Banco Interamericano de Desarrollo, 2014). The National Environmental Sanitation Service (SENASA) provides support to more than 2000 boards constituted formally as community organizations, SENASA has developed the ÑAMOMBARETE and ME'ÊHÀRAPE model for the organization of a Community body under functional categories: institutional and legal, administrative, commercial, financial, technical and operational (Carrasco, 2011). This program aims communities to organize themselves under a established framework inspired on a business model, looking for operational and financial outcomes. This model is a well developed initiative of capacity development, strengthened by a supportive program rooted in the national level.

3.8 Peru: SABA Model (1998-2014)

Peru is a decentralized unitary state, but it has not integrated the right to water and sanitation yet in the constitutional order and does not have a general water law, but there is a project under construction. The National Service for Water Supply and Sewerage (SENAPA) and the General Law of Sanitation Services in the eighties, established the institutional framework and the responsibility of the provincial municipalities in the provision of services. It also disposes of Provider Entities of Sanitation Services (EPS) for programs or projects of technical assistance to rural providers, which work in the strengthening of their associates through training, coordination and cooperation. The population that is not attended by the EPS is covered by management boards of sanitation services (JASS), which have support programs in both municipal and national levels, example of this is the Medium Term Plan (2013-2016) of the National Programme for Rural Sanitation (PRONASAR). They are supported technically and financially by regional governments (Rojas, 2014).

The Integral Basic Sanitation (SABA) model began to be implemented since 1999, in collaboration between the Swiss Agency for Development and Cooperation (SDC) and the regional and municipal governments of the regions of Cajamarca, Cusco and Puno, by implementing an integral intervention strategy headed directly by SDC in Peru. In each region operates a regional executor, which may well be the very SDC or an NGO, and that directly collaborates with regional and municipal government. The model has several lines of action: citizen participation, infrastructure, health education, management, operation and maintenance and institutional support of local and regional government, and follows phases of the project (CARE, SDC & Government of Cajamarca, 2011). Until 2014 it has been implemented in thirteen regions of Peru with good results and SDC has managed to coordinate with the Ministry of Housing and Sanitation, but documentation of the national impact is under construction. SABA model is a mature example of co-management with collaboration amongst stakeholders in the regional and local level (Bernal et al., 2014).

4. The Community Water Management in Mexico

Mexico is a federal state and the lead organism for water management at a national level is the National Water Commission (Conagua), which is divided into headquarters, basin organizations and local addresses: and coordinates investments in small-scale systems with municipalities, who according to Article 115 of the Constitución Política de los Estados Unidos Mexicanos (2014) are in charge of providing water services and sanitation in the country's states. However, being a country with a federal structure, in the access to water and sanitation in rural areas, coordination between levels of federal, state and municipal government is essential. In fact, community management is not contemplated clearly in the constitutional system, but there are programs to support the increase in the coverage of potable water, sewerage and sanitation in rural communities of less than 2500 inhabitants that are formulated by the federal government in coordination with the National Water Commission and the Mexican Institute of Water Technology (IMTA) (Comisión Nacional del Agua, 2014).

On the other hand, there is the Water and Sanitation Program in Rural Communities (PROSSAPYS) for infrastructure construction, coordinated by the National Water Commission and executed with national resources. It corresponds to the states the promulgation of state laws and in many states, the policy development in this field is zero or very low. Moreover, the same program PROSSAPYS evidence these regulatory gaps. Since its first phase in 2008, it has changed its structure four times, demanding in its beginnings the structuring of co-administrations in which community organizations should include representation of municipal government; to the last version that admits community organization as a autonomous management organism (Comisión Nacional del Agua, 2014). This program has given results in the increase in the coverage of potable water and sanitation from 15.3 million inhabitants in 1996 to 19.6 million inhabitants in 2010 (OECD, 2013) and which currently contemplates a works component with an inclusion of tentatively 1860 potable water projects and 600 of sanitation (Bocco, 2013). However, support for this management is variable and is according to the needs of each municipality of the states (Comisión Nacional del Agua, 2013).

The rural areas in Mexico are of special interest since water coverage is lower than in urban areas: 95.5% of coverage in urban areas against an 80.3% in rural areas in 2012 (Comisión Nacional del Agua, 2013). The treatment of community management at regional and local level is diverse and there are numerous efforts, many of them undocumented yet, to strengthen community organizations (OECD, 2013).

In the case of Chiapas, it have been established more than 800 boards in more than 100 of its municipalities and has been created a community fund to manage the financial contributions (OECD, 2013). It is worth noting that rural communities were included in the Ley de Aguas para el Estado de Chiapas (2000) but communities are subject to municipal management to receive municipal, state or federal support.

Another case worth mentioning is the one of San Felipe del Progreso, in the north of State of Mexico, which has

3 sources of supply and on the communities operate 51 wells through independent community committees, to which they are provided counseling and support for the operation of its Potable Water Systems, through concession contracts and restructuring of water infrastructure (Honorable Ayuntamiento de San Felipe del Progreso, 2013).

On the other hand, in the municipality of Cardonal, Hidalgo, the Community system was compared with the public of the city council and it was concluded that the first system was more convenient because it covered all its costs and it operated rapidly by not being subject to bureaucratic organizations that delay the decision making (Galindo & Palerm, 2012).

Similarly, rural councils have been created in Chihuahua, rural water committees in Guanajuato and San Luis Potosi, management units for sustainable water development programs in Tabasco and community organizations in Guanajuato and Tabasco (OECD, 2013). What is more, in the Anthology of Palerm and Martínez (2013) are described some cases of community water management in the State of Mexico, Oaxaca, and Morelos, among others.

In the southern states of Mexico, it has been formulated a project of strengthen the capacities through consultancies for the rural communities, using the Self-Esteem, Associative Strengths, Resourcefulness, Action-Planning, and Responsibility (SARAR, 2012) strategy. Likewise, the Ecological Sanitation Response (EcoSanRes, 2012) program is under the auspices of the United Nations Development Programme through a pilot project in the town of Tepoztlan (TepozEco Program) focused on ecological sanitation.

5. Research method

In this documentary and exploratory research, a critical review of community management of water in LAC is carried, in order to obtain challenges and opportunities for the implementation of community water management in Mexico, as a contribution to the fulfillment of a constitutional and legal mandate, established in the Constitución Política de los Estados Unidos Mexicanos (2014) and the Ley de Aguas Nacionales (2014). To identify the experiences and models, was resorted to various documents, mostly official or electronic publications of NGOs, since these cases are poorly documented in the scientific literature.

Retaking the analysis of Bernal et al. (2014), a review of methodologies and theoretical models of community management that contribute to the description and characterization of this phenomenon was performed, according to publications of widely cited authors by the scientific community (Ostrom, 1990; Narayan & Pritchett, 1999; Carlsson & Berkes, 2005; Hess, 2008; Binswanger-Mkhize, De Regt & Spector, 2010; Ferro & Lentini, 2010; Poteete, Janssen, & Ostrom, 2010; Rosensweig & Kopitopoulos, 2010; Lockwood & Smits, 2011; Ray, 2014).

For this study, the analytical categories used were those considered by Lockwood and Smits (2011) for their contribution to the comparison of the institutional and legal framework in different countries of LAC and their incidence in the models applied.

6. Analysis and Results

Collective action as a response to management of natural resources has a recent theoretical development based on the analysis of the empirical evidence with different currents of interpretation (Ray, 2014). The theory of common pool resources (Ostrom, 1990) and the analysis model of social-ecological systems Ostrom (2009). In addition, Poteete, Janssen and Ostrom (2010) establish the incidence of institutional and policy context in the construction of the forms of management, while the models of co-management (Binswanger-Mkhize, de Regt, & Spector, 2010; Rosensweig & Kopitopoulos, 2010) demonstrate the importance of the deployment of community management as a shared responsibility between different levels of government. Moreover, Smits and Lockwood (2011) highlight the important role of the different levels of government on the structuring and coordination of the necessary functions for access to water and sanitation. For these reasons, a model of community management should involve the different levels of government in relations of coordination and cooperation, but this depends largely on the existing regulation or of the existing institutional arrangements that assign functions to each of the levels of government (Bernal et al., 2014).

On the other hand, in the case of the DESCOM-FI model (Bolivia) (Fondo Nacional de Inversión Productiva y Social, 2009) there is an entitlement to water in the constitution, special water law and a management model regulated by a co-management strategy. While in the AQUACOL model (Colombia) (Smits et al., 2012) there is no a special legislation for water, but exists the National Rural Water Programme and Public Policy CONPES 3810 of 2014. Although exists community strengthening, technical assistance and tracking through the support of international organizations. Similarly, the ROSCGAE-CENAGRAP model (Ecuador) (Foro Nacional de

Recursos Hídricos, 2013) has the backing of the right to water in the constitution and a special law, but there is not a regulated management model. It has a strategy of co-management with Public-Community Alliances and execution in second level organizations. Moreover, the model AHJASA (Honduras) (López, 2011) has the right to water guaranteed by municipalities and the capacity strengthening, technical assistance and monitoring by means of support of international organizations. Similarly, the AGUASAN model (Honduras) (SDC, 2014) presents a co-management strategy coordinated with the regulator entity and the accompaniment of NGOs. In the case of model ÑAMOMBARETE and ME'ÉHÁRAPE (Paraguay) (Carrasco, 2011), the right to water is still not in the constitution, there is a special law and community strengthening, technical assistance and monitoring. Also, in the model SABA (2014) (Peru), there is no right to water yet in the constitution and there is no special law, but has the National Programme (PRONASAR) with a co-management strategy implemented in regions and municipalities through public-private alliances and the accompaniment of NGOs for the operational and financial sustainability. In the same way, the SISAR model (Brazil) (Meleg, 2011) applies to a country that is entitled to no constitutional water, is the only federal state along with Mexico of the countries of Latin America and the Caribbean analyzed in this article, has regulatory autonomy and a strategy of co-management, joint management of the administration and financial sustainability. Finally, Mexico has the Model SARAR (2012) and the constitutional right to water, emphasizing the National Program (PROSSAPYS) with normative autonomy and strengthening of capacities.

Of the cases studied, the following observations are derived: in those states where it has reached the consecration of the human right to water within the constitutional system, there is a greater institutional and legal concern about deploying support strategies to community management from the state. However, it is the special legislation that confers rights, responsibilities and functions to community organizations, opening the way to recognition and strengthening of community management, as it facilitates regional and local action. With everything, the experiences analyzed derive their success largely on the commitment of regional and municipal governments, who with political will, facilitate the deployment of the strategies and financially support the initiatives, although there is no constitutional norm or specific regulation of the national level on this matter. In the cases of Bolivia, Ecuador and Paraguay, the breakthrough of community management is evidenced as a national strategy for access to water, from the constitutional provision and the special norms; while in Honduras, Colombia and Peru, the analyzed initiatives have been developed at the behest of international cooperation agencies and NGOs that articulate institutional and community action in specific locations, in the absence of a specific regulation and a consolidated budgetary sustenance. To this extent, the Mexican case is unique, because although there is a constitutional norm for access to water and sanitation as a human right, according to recent reform in 2012 of Article 4 of the Constitution (Constitución Política de los Estados Unidos Mexicanos, 2014), there is no clarity on the recognition of community management as an alternative for local development in this matter, in the same Constitution. This contrasts with what happens in the practice, since the actions of the IMTA for small communities and the PROSSAPYS program focus precisely on these organizations as public policy objective. Thus, the normative border is found in the absence of a norm of national order that regulates the matter, and in its corresponding development in each of the states, norms needed to ensure the flow of resources and the institutional responsibilities for the continuity of the efforts sponsored from the national order. However, the fact that Mexico is a federal state with regulatory autonomy is not an impediment for the implementation of strategies of support to community management. The local cases analyzed in the states of Mexico, Hidalgo, Chihuahua and Chiapas, among others, reiterated the hypothesis of efficiency of these initiatives when they have the support of the local government. Situation which is corroborated by the SISAR model of Brazil and the CENAGRAP case in Bolivia that, regardless of the type of state, have managed to be successful in the regional scale. Another aspect to highlight is the existence of institutional arrangements through community-public alliances and public-private alliances, and even some private-community in which the public sector intervenes only as a regulator, which is observed in the practice and therefore is being regulated. While the public-community alliances could be taken as the evolution of for an approach that enables the management of common goods in head of the communities but with public intervention, the private-public and private-community alliances are also an alternative for the achievement of resources and the conciliation of interests at the local level. What should not be lost sight of in this type of institutional arrangements is the influence that both the public and the private sector can acquire on the community. This requires that these strategies be accompanied of the empowerment necessary for the negotiation between equals.

It can be observed that in the same country can coexist several management models, with regional or local influence, as in the case of Honduras, or a model that replicates in different countries, as happens with the experiences of SDC in Honduras and Peru. This evidence supports the similarities and differences of community management as a phenomenon with global presence but rooted in the local, and the enormous benefits of having

flexible legal frameworks and administrative autonomy so that management forms are responsive to local needs. Nationally, in Mexico it is recommended that institutional and legal frameworks be reformed, in order that community organizations could have legal personality and will be recognized as organizations that are not public or private. To overcome barriers that may arise over these reforms, there should be a consensus among the three levels of government in Mexico which should consider the views of community organizations and researchers in the field. It should be performed in this way to avoid problems in the implementation of new regulations, as happened recently with the proposal of the Ley General de Aguas (2015) in this country, which includes water management operated with concessionaires, but it is not mentioned how to deal with CWB.

It is suggested that Conagua coordinates in conjunction with community organizations, allowing them freedom to form public and private alliances. In addition, the form of exploitation and utilization of national waters for these organizations should be specified (Article 20 of the Ley de Aguas Nacionales, 2014), so that it is not carry out illegally. Support programs for these communities should exist on the part of the municipalities of the states, entities closer to rural areas, according to Article 115 of the Constitution (Constitución Política de los Estados Unidos Mexicanos, 2014), they are responsible for providing the public water service. Another point to note is to consider the amendment of Article 15 of the Ley de Aguas Nacionales (2014) so that in the hydrologic planning, the communities would be considered in water management through various supervised programs. In the same line, statewide, in the institutional and legal frameworks, should be defined the municipal responsibilities and the actions of support and supervision for the community management, always respecting the national regulations and the institutional coordination with the different levels of government. It is worth considering that state laws may re-enter spaces of community water management, some examples were described in this paper in the community water management in Mexico.

At the community level, should take into account the project management for the organization of a community organism, with either public or private support. It should be strengthened institutionally, for the legal operation of the organism and the development of human capital. Once the municipal incorporation is performed through reforms to Article 115 of the Constitution (Constitución Política de los Estados Unidos Mexicanos, 2014), the community organizations should have autonomy to manage the water in their territories in coordination with the three governmental levels, so that they do not have restrictions on receiving state aid, as at present.

7. Conclusions

The countries of Central and South America show greater experience than Mexico in the community management of water, due to the evolution of the co-management models sponsored by external support. It can be affirmed, coinciding with the studies of Lockwood and Smits (2011) that the success of a model for community management of water depends on its impact on different areas of decision, whether in public policies, normativity, institutional strengthening, technical support, financing, security, among others, and working in coordination with the government, external support organizations and communities. Also, the legal framework of the countries analyzed remarks the importance about community organizations keeping autonomy for decision-making in their management systems. Regarding that Mexico is a federal state and not a unitary state with high levels of centralization, as it happens in the majority of Latin American countries analyzed, the frameworks and institutional development of the co-management models explored are not applicable as they are structured in Mexico. The only comparable case with Mexico in terms of its political organization is Brazil, which is also a federal state. Nevertheless, there are many lessons learned to derive from these experiences, in terms of functional structure and promotion of collective action led by the local and regional authorities.

The recommendations to promote social inclusion and local development in order to enhance a sustainable provision of water and sanitation services in Mexico, include the coordination of its 3 levels of government: federal, state and local (Rojas, 2014; Diz, Lois & Novo, 2012; PROTOS-CEDIR, 2011) that will ensure a participatory management and an equitable access to water. This goal require reforms to the legal framework to recognize and regulate this type of management in the country, in which public resources are exercised in the execution of consensual plans around national goals, but leaving to the community organizations the autonomy in decision making regarding the equitable access for personal use and conditioned concessions according to ecological availability and priority of use.

Finally, further research on community water management in Mexico is suggested, due to the scarce literature on the subject, to analyze this issue as management experiences from the perspective of the public administration.

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