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Articles

Fundamentals, obstacles and challenges of public participation in water Management in Mexico
Fundamentos, obstáculos y retos de la participación pública en la gestión del agua en México

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Abstract

In the last three decades, Mexican water management policy has been reformed to include the participation of social actors in the decision-making process. Nonetheless, water governance receives intense criticism from those who consider that this participatory approach has

decreased the efficiency in decision-making and others who believe that public participation is not efficiently included. To clarify this debate, we identify the fundamentals, the obstacles, and the challenges of the public involvement in water management through a systematic review of the literature. We found that the restrictions of such involvement are most likely associated with: 1) characteristics and context of the participants; 2) different levels of information and power; 3) institutional arrangement and rules of the process; 4) the lack of resources to participate, and 5) the lack of motivation and political will. The most critical challenges are: a) decentralization; b) the combination of technical and non-technical knowledge; c) the strengthening of capacities for participation, and d) the influence of the government in the decision-making process. With these elements, we elaborate an analytical framework and come up with the recommendations to improve public participation in water management in Mexico.

Keywords: Decision-making, stakeholders, water governance, water resources, water policy.

Resumen

En las últimas tres décadas, la política de la gestión del agua en México se ha reformado para incluir la participación de los actores sociales en el proceso de toma de decisiones. No obstante, la gobernanza del agua recibe fuertes críticas de parte de aquellos que consideran que este enfoque participativo ha disminuido la eficiencia de la toma de decisiones y otros que creen que la participación pública no se incluye de manera eficaz. Para aclarar este debate, identificamos las bases, los obstáculos y los desafíos de la participación pública en la gestión del agua mediante una revisión sistemática de la literatura. Encontramos que las restricciones de dicha participación probablemente están asociadas con: 1) características y contexto de los participantes; 2) diferentes niveles de información y poder; 3) arreglo institucional y reglas del proceso; 4) la falta de recursos para participar, y 5) la falta de motivación y voluntad política. Los desafíos más críticos son: a) la descentralización; b) la conjunción de conocimiento técnico y no técnico; c) el fortalecimiento de las capacidades para la participación, y d) la incidencia del gobierno la toma de decisiones. Con estos elementos

elaboramos un marco analítico y presentamos recomendaciones, a fin de mejorar la participación en la gestión del agua en México.

Palabras clave: toma de decisiones, actores clave, gobernanza del agua, recursos hídricos, política del agua.

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Introduction

Over the last thirty years, in Mexico there has been an increase in social conflict and movements related to some aspects about water (e. g. human rights, privatization and defence of public resources, democratic decision-making, access to information, environmental justice), which has generated different forms of social inclusion on water management, where public participation and legislative and administrative reforms are central (Castro, Kloster, & Torregrosa, 2004; Barkin, 2006; De Alba, 2007; Kloster & De Alba, 2007). In this article, we examine the scientific literature in Mexico related to water governance and management to point out the challenges, obstacles, and opportunities for institutionalized water public participation, to understand how this process works in practice and how to improve its implementation.

Accordingly, the Global Water Partnership proposed the Integrated Water Resources Management (IWRM) as an institutional alternative that promotes the participation of different stakeholders and institutions in government decision-making. This means a change in the traditional water management model characterized by government centralization to a decentralized model per basin as the critical element of water policy (GWP, 2000).

Mexico incorporated the IWRM as a response to the socioeconomic crisis in 1982. Water scarcity and pollution, deterioration and lack of water infrastructure lead to taking loans from the World Bank, the International Monetary Fund and the Inter-American Development Bank, which usually focus on economics, privatization models or the public and private sectors collaborations (Rolland & Cárdenas-Vega, 2010). Another possible reason is that an epistemic community mainly influenced the adoption of the IWRM approach through international events related to water, sponsored by strong international institutions and with the capacity to have efficient transnational communication for the dissemination of the model (Ruiz-Ortega, 2015).

Although the IWRM contemplate a new institutional design, decentralization and social inclusion, it has been a slow process that hinders establishing inter-institutional synergy and finding solutions that benefit the collective well-being, in accordance with the National Water Program 2014-2018 (DOF, 2014). The popularity of the IWRM lies in the fact that is an imprecise concept that allows some people to continue to do what they were doing in the past, but under another label to attract additional funds, or to obtain greater national and international acceptance and visibility. Then, it is hard to take into practice since participation is one of the different aspects in the IWRM model (Biswas, 2004).

During the last few decades, water management literature has been accumulating, but there is a mismatch between federal regulations and local situation, deficiencies in institutions and lack of agreement (Cotler, 2004). The management has been dominated by a technical vision of Mexico's National Water Commission (Conagua, for its acronym in Spanish) and the forums (community committees, councils, commissions and committees per basin, watershed or aquifer, irrigation districts and water user associations), recreate conflicts, are exclusionary or lack legitimacy, credibility, acknowledgement and communication amongst stakeholders (Castro *et al.*, 2004; Córdova-Bojórquez, 2005; Vargas & Mollard, 2005; Wester, Hoogesteger, & Vincent, 2009; Marañón, 2010; Hernández-Suárez, 2011; Aguilar-Barajas, Sisto, Magaña-Rueda, Ramírez, & Mahlknecht, 2016; Romero-Navarrete, 2016). Then, critics have diverted into the aspects of design or institutional arrangement and those related to putting it into practice

(Mussetta, 2009; Eakin, Eriksen, Eikeland, & Øyen, 2011; Parra-Armenta & Salazar-Adams, 2018).

Therefore, in this article we discuss the elements that facilitate or inhibit public participation in integrated water management. The objective is to argue that although public participation is necessary, convenient and even in some cases mandatory to improve decision making in IWRM, gives more credibility to institutions and reduces conflicts between stakeholders, in practice several obstacles preclude the possibilities for active public participation. This paper offers an analysis containing its fundamentals, challenges, and limitations and provides a guide to participation in integrated water management. The results may be relevant to provide insights of the experience in Mexico in the implementation of participatory processes.

The definition of public participation in water management

Each country takes on the concept of IWRM differently. In the México's National Water Law (NWL) , water management is a process sustained by principles, policies, acts, instruments, norms, assets, resources, rights, and attributions which, the State, water users and social organizations promote and implement: 1) sustainable development; 2) watershed control and management; 3) use and exploitation, regulation, and 4) water resources preservation and sustainability in quantity and quality (DOF, 2004, title I, article III, fraction XXVIII). In the 2004 NWL Rules, it is recognized to involve groups and individuals, by participating and being responsible for water-related activities.

The importance of participation in the IWRM, resides in the fact that: 1) it is a mechanism to incorporate different stakeholders in a more democratic decision-making, matching local experiences with technical knowledge in a watershed; and 2) it is a requirement to improve water

management at local level, adopting legitimate, consensual, informed and socially acceptable solutions and rules that promote their development and reduce conflict between stakeholders.

However, making participation practical is still problematic (Dourojeanni, 2004; Scott & Banister, 2008). Usually, public participation is known as the incorporation of stakeholders from the government, business, academic, and civil society sectors who are interested or affected by a specific problem and will make decisions to formulate and monitor the resulting policies. According to the reviewed literature, the definition can vary with: 1) the context; 2) the openness and sharing of power; 3) the type of policy instrument (plan, program, rules, and laws); 4) the provided space or forum; 5) the type of stakeholders, and 6) acknowledging legal, ideological and instrumental basis. Altogether, this recreates arguments for and against participation as a way of attaining a goal, or it is a goal itself. However, there is not a formal definition of participation in water-related matters, so it is suggested to be defined as the level of decision-making in each case.

Public participation is a critical component of the process of formulating and executing public policies (Pineda-Pablos, 2002). In the locality, participation is reflected in the community's compromise, decentralized management and participative development (Córdova-Bojórquez, Romo & Peña, 2006; Perevochtchikova, Aponte-Hernández, Zamudio-Santos, & Sandoval-Romero, 2016). Then, *participation in integrated water management* leads to decisions made by authorities of different levels (federal representatives, regional and state managers), and allows citizens with the right to vote (users with a water concession) and others just with voice (local or municipal managers, academy, organized citizens) to become a collective authority questioning the social division of labour and responsibilities in the management between the government and those governed, with the attempt to: 1) reach consensus on how water is used or allocated in different areas (Marañón, 2010; Marín, 2014; Aguilar-Barajas *et al.*, 2016; Romero-Navarrete, 2016); or 2) competing to influence the design and local execution of water policies (Pineda-Pablos, 2002).

The present article brings forward that the institutionalized public participation in water management (IPPWM) is a process that includes affected and interested actors from different sectors, such as federal,

state, and municipal authorities; private sector, academy, social organizations and water users, in policies and decision-making, as well as regulations and water resources' management.

In Mexico, we must also consider participation is restricted from users, institutions, organizations and social groups interested in management, according to the NWL (DOF, 2004, article 15, paragraph II and article 19 BIS). Therefore, participation only considers those who have an interest or those who can influence decisions. However, even if the users and citizens are considered participants, only the federal authorities of Conagua can make final decisions and not the rest of the stakeholders.

Elements of public participation in water management

In Mexico, the National Water Law establishes the essential elements of the participation mechanisms, the performance and their sphere of action. These mechanisms allow, from the elaboration of recommendations on national water public policies (by the Advisory Water Council) to the integration of users in the management level of a river watershed or aquifer (Marín, 2014). Then, these mechanisms emerged to apply the IWRM approach in water policy and regulations.

In general, Mexican studies have focused on the performance of Basin Councils, Basin Committees, Irrigation Water Committees and Groundwater Technical Committees (COTAS). The researchers have encountered limitations in the participation processes derived from de management model, centralism, institutional federal control, participatory mechanisms limited to public consultation and the poor quality of information (Castro *et al.*, 2004; Mussetta, 2009; Wester *et al.*, 2009; Guerrero-de León *et al.*, 2010; Marañón, 2010; Hernández-Suárez, 2011; Aguilar-Barajas *et al.*, 2016; Parra-Armenta & Salazar-Adams, 2018). Nonetheless, the empiric information is still limited for

comparative analysis on better institutional practices, participants' characteristics and the contexts that produce better results in the performance of participation methods and mechanisms.

Social stakeholders' participation is established according to the type of relationship between the institutions and the level of influence it can take on the products. Some levels go from manipulation to the empowerment of participants when they hold control in decisions and characterize by differences in the type of interaction established between public institutions and users and the level of influence of users and the application methods. The degrees of participation give out a useful tool to interpret the quality of the involvement and the evolution of political communities. However, the degree of participation is not considered in previous Mexican research.

Various authors have described the type of stakeholders and sectors involved in water management as well as those who are usually not considered in the participative process when their concerns are not considered. Basically it depends on the context and if the stakeholders have an interest in decisions or can influence them (Franco-García, Hendrawati-Tan, Gutiérrez-Díaz, Flores, & Bressers, 2013). The stakeholders typically involved in water management are: 1) those affected positively or negatively by the decisions or have economic-political interests (businesses, international advisory bodies, producers, agricultural and water user's, landowners, vulnerable groups, neighbours and their coalitions); 2) those who have technical and preservation interests (institutions with scientific-technological projects, academic authorities, civic organizations that promote water culture or local communities); and 3) those who make the final decision (water and environmental authorities and others with planning attributions).

Usually, unorganized stakeholders are excluded when they lack the information to debate and argue for their interest (Pells, 2015) or lose interest with time and are left out. Not considering specific groups for decision-making leaves a false consensus, where the excluded can resist the results (McCulligh & Tetreault, 2017). For this reason, individuals should be chosen to legitimately represent those who will have a responsibility to follow and apply the decisions made.

In summary, the elements of participation indicate the existence of arguments for the inclusion of different types of theoretical

fundamentals (legal, ideological or instrumental) and participants (affected and interested in decisions on water management). However, to have more active participation, its limitations and challenges must be foreseen. The purpose of the following sections is to examine in greater detail the factors that interfere with participation in water management.

Method

We identified 39 articles and 21 book chapters published between 2000 and 2018 that relates public participation with water management in Mexico. The literature was found in the following databases: Web of Science of the ISI Web of Knowledge platform; Scopus and Science Direct from the Elsevier platform; BioOne, Ebsco Host from Ebsco Industries Inc.; Scientific Electronic Library Online (SCIELO); Google Scholar of the Google platform and Springer Link from the Springer Nature platform. We do not consider the documents that will not have peer-review or documents presented at academic conferences, although we recognize that some contributions could be relevant to this article. The search was performed using the keywords: *social, citizen, community and public participation in water management; governance; Mexico* (English and Spanish). We recognized topics and concepts by the complete and repeated reading of the evidence before initiating the analysis, searching for emerging issues on fundamentals, limitations and challenges of public participation in water management and reading prior studies for further interpretation, according to the Grounded Theory (Corbin, 2016). Then we identified the main points of debate, allowing us to draft the theoretical approaches on the matter.

Results

Fundamentals of public participation in water management in Mexico

We identified three fundamentals for public participation in water management as an opportunity to adopt an integrated approach: 1) legal, when the legal framework and current regulatory agreements are met; 2) ideological, when it appeals to democratic participation and governance, and 3) instrumental, when it is a means for education and learning, facilitating useful information and increasing the quality of decision-making process and its products. The majority of the publications analyzed develop the legal fundament, followed by the instrumental, and then the ideological. Some publications address aspects that relate to more than one fundament (Figure 1).

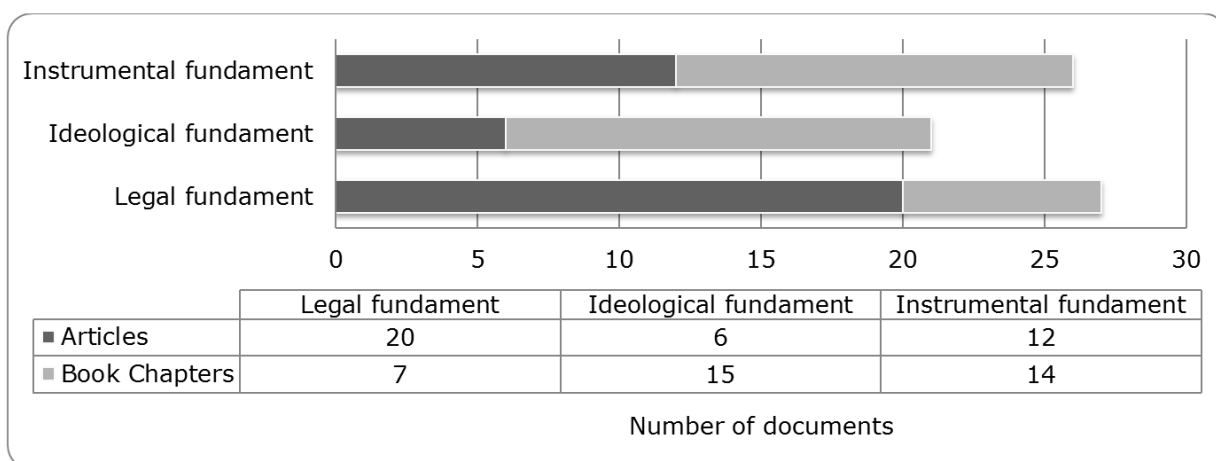


Figure 1. Systematic review of the literature on public participation in water management.

Legal fundament: participation as the practice of rights and obligations

The international agreements have established guiding principles on involvement in water management which have been retaken by Mexican legislation. However, this means a change in institutional arrangements and the legal framework that have made it difficult to establish a link between the modifications that regulate water management at national level and the claim to apply international principles.

The 1992 Rio Declaration on Environment and Development add the public into political decision making related to water. The Rio Declaration recognizes the existence of different ways in which the stakeholders can be involved in decision-making concerning water resources: from facilitating information, securing a greater involvement in the process and even promoting the possibility for citizens to complain. Principle 10 emphasizes that citizens should have access to the opportunities and information to participate in the processes of environmental decision-making (UN, 1992). Mexico includes Principle 10 in its regulations seeking to reach the IWRM.

The International Conference on Environment and Water, and The Dublin Declaration on Water and Sustainable Development, as part of the arrangements for Rio Summit in 1992, states in Principle 2 that the better use and management of water should be inspired by the participation of users, planners and those responsible for decisions in all levels (UNESCO, 1992). In this approach, the public and those responsible for policies are more aware of the importance of water and decisions are taken on a more elemental level with public consultations and users participating in planning and execution of water projects.

Recently, the OECD Ministerial Council established the 12 Principles on Water Governance, which are clustered around three main driving goals: effectiveness, efficiency, and trust and engagement. The 10th Principle promotes stakeholder engagement for informed and outcome-oriented contributions to water policy design and implementation (OECD, 2015).

In Mexico, IPPWM is based on exercising rights (petition, transparency and access to information, widespread complaints, and democratic participation in national plans and programs) and obligations (federal and municipal competencies) that are addressed in the Political Constitution (Articles 6, 8, 26, 27 and 115), the General Law of Ecological Balance and Environmental Protection, the Organic Law of the Federal Public Administration, the Planning Law, the Federal Law for the Promotion of Activities Undertaken by Civil Society Organizations, the Federal Law of Transparency and Access to Public Information (LFTAIPG), the Federal Methodology and Normalization Law and others from the federal and state water sector.

The National Water Law, enacted in 1992 and reformed in 2004, specifies the institutional arrangements for social participation in decision-making, decentralization and improvement of water management at the water basin level through watershed or Basin Organizations and Basin Councils and their auxiliary organs: Basin Commissions, Basin Committees and Technical Groundwater Committees, as well as the water committees of the irrigation districts as entities for proper water management and infrastructure (DOF, 2014). Another citizen organ is the Water Advisory Council, which works as a civil association and as a consultant of different organizations of the public, social and private sector (Rolland & Cárdenas-Vega, 2010).

The principal policy instrument on water management is the Mexican National Water Program 2014–2018, which exhibits a guideline on developing a Water Culture with an informed and participative society. Each of the 32 Mexican states has its water plan and, in some cases, each municipality also has a local water plan.

The Mexican constitution was reformed on February 8th, 2012 to include the right to access, disposition and water sanitizing for personal and domestic use that is sufficient, clean, acceptable, and accessible water, with federal and municipality participation, where citizens are also included. Therefore, it is one of the essential legal fundamentals that tie public participation with water management in the country.

Derived from the constitutional reform, there is an agreement in the Mexican Congress to reform the NWL with the purpose to change the legal structure of water management to include the Human Right to Water and Sanitation and generate more openness to public

participation in the Basin Councils. However, the project of NWL submitted by the executive branch in 2015 has received intense criticism from civil society and academia, which has prevented its approval in Congress (Romero-Navarrete, 2016).

Therefore, the legal basis, which appeals to compliance with global agreements and the existing regulatory framework, is one of the leading arguments to promote the public participation in water management because it supports a change in human behavior, allocate the capacities of government authorities and allows the exercise of justice.

Ideological fundament: Participation as an act of openness and power distribution

The participation in water management should happen through democratic mechanisms where government and non-government actors collaborate in decision-making. It calls for the citizens' right to participate in public matters and the institutions' obligation to show transparency in their activities. This fundament has been taken up by political agendas that intend to reform the power exerted and the relationship between society and government.

After the economic crisis in the 70's, the legitimacy of the representative democracies was questioned as well as their effectiveness to solve social problems (Castro *et al.*, 2004). In response, a participative democracy was proposed, where the government's decisions acquired their legitimacy through public acceptance. This framework is based on the citizens' right to participate in matters that affect them, following the principles of equality and social justice that establish that the voice of the less powerful should also be listened to generate joint responsibility. This is how participation in water management became part of a Mexican political agenda that sought democracy and to transfer the power of decision to the citizens (Pacheco-Vega & Vega, 2008; Vargas & Mollard, 2005; Córdova-Bojórquez, 2005; Córdova-Bojórquez *et al.*, 2006; Pells, 2015; Romero-Navarrete, 2016).

Participation in water management was promoted from different schemes that intended to reform governmental institutions as in the case of the "good government," "the rational government," "the good governance," "the adaptive governance" or just "the governance." These proposals indicated that the traditional governance, characterised by its centralism and hierarchy, had been insufficient to respond to demands from a more complex and diversified society and look for collaborative techniques in the field of conflict resolution between users competing for water (Chávez-Zárte, 2004; Mussetta, 2009; Pacheco-Vega & Vega, 2008; Caldera-Ortega & Suárez-Paniagua, 2015; Casiano-Flores, Vikolainen, & Bressers, 2016; Cadena-Inostroza & Morales-Fajardo, 2017).

In this context, governance has been one of the most influential proposals in water management. This refers to the range of political, social, economic and administrative systems to manage water resources and services in different levels of society (Rogers & Hall, 2003). It also addresses the compromise and abilities of the citizens to participate in decision-making through rational deliberation to articulate their interests, concerns, and needs (Mussetta, 2009), through dialogue, consensus and conflict negotiation (Valencia, Díaz & Vargas, 2004). Also, governance proposes that water management should be based on principles like responsibility, transparency, participation, equality, ethics, and sensibility to water-related issues, as well as the local right to water (Chávez-Zárte, 2004; Domínguez, 2006; Domínguez 2011).

In the case of Mexico, participation in water management is a mechanism that attempts to deal with the growing political conflicts in the sector, linking involvement to broader government transformations that respond to a crisis of governance and legitimacy of public institutions (Castro *et al.*, 2004; Córdova-Bojórquez, 2005; Domínguez, 2006; Domínguez, 2010; Kloster & De Alba, 2007; Pacheco-Vega, 2014; Caldera-Ortega & Suarez-Paniagua, 2015; Romero-Navarrete, 2016). For example, Marañón (2010) and Wester *et al.* (2009) analysed the centralism of Conagua exercised in the COTAS during the decision-making process, and Pineda-Pablos (2007) analysed how social participation and public deliberation are crucial for the feasibility of public projects, and to achieve governance in the process of democratic transition. Then, there is an intention of decentralizing the

administration and incorporate political diversity with the aid of participative mechanisms (Mussetta, 2009).

The ideological fundament exhibits participation in water management as a process that makes public institutions democratic and attempts to solve the governance crisis and lack of institutional legitimacy by having citizens and diversified policies partake in deliberation and decision-making. The studies that discuss this fundament in the Mexican context find that promoting institutional participative mechanisms corresponds to a government agenda which in practice hardly translates to change in the water users' situation locally.

Instrumental Fundament: Participation as a mean to ensure quality and capability in decisions

Public participation in water management has an instrumental basis as a way to improve the quality of the decision-making process and its products. This is achieved by sharing resources, knowledge, and lessening the conflicts between stakeholders (Jacobs *et al.*, 2016).

Water management presents a complex, non-linear and dynamic interactions of the human and environmental systems. Then, inherent uncertainty to imperfect scientific knowledge and indetermination of complex processes must be taken into account for planning (Ramírez, Seeliger, & Di Pietro, 2016). The social stakeholders possess resources, knowledge, wisdom and perspectives on water management so that the interaction, use of technologies and communication between them contribute to sharing and updating data, information homologation and building new knowledge (Perevochtchikova *et al.*, 2016). Since the resulting policies are imperfect and unfinished, and are implemented in changing environments, one of the most valuable participative products is learning from the stakeholders that intervene in decision-making.

It is claimed that participation itself creates benefits such as 1) exchange of information; 2) a better understanding from the

stakeholders with less access to information about technical aspects of the problem; 3) "social learning" from authorities, experts, interest groups, communities and among stakeholders; 4) accumulation of experience and knowledge, and 5) raising awareness (Peña & Córdova, 2001; Benez, Kauffer, Soares & Álvarez, 2010; Perez-Fuentes, 2010; Perevochtchikova *et al.*, 2016; Ramírez *et al.*, 2016). This way, participation becomes an end in itself for the positive effects produced by stakeholders involved.

Thus, public participation improves the quality of public policy products by opening the decision-making process and making better use of the information and creativity available in society. The general understanding of water management problems can improve; have a more transparent decision-making process, and encourage the authorities to coordinate their actions better. Then, water management cannot be approached without taking collaboration, information and different perspectives of those involved into account. The interdependence of these elements becomes more relevant, but it is linked to the institutional arrangements that make interaction possible.

Obstacles to public participation in water management

In practice, the difficulties of achieving a genuinely inclusive involvement in water management, which is informed and with joint responsibility, are rarely recognized. However, researchers are showing the obstacles that stop public participation from reaching integrity or even water governance (Table 1).

Table 1. Obstacles to public participation in water management.

Obstacle	Description
Inconsistency in characteristics and context of	Differences in class, gender, age, ethnicity, language, race or economic status; different levels of group organization. As well as, the lack of resources for dialogue, any existing social

participants	conflict, religions, and ethnicity in the place and between groups.
Different levels and quality or resources for dialogue	Lack of transparency, deficiencies in quality and inaccessibility, use of technical language, asymmetry in data and information of participants and non-participants, differences in knowledge about how the environmental and human systems work.
Inadequate institutional arrangement and decision-making process	Critiques of the institutional and legal design that produce non-binding decisions; undefined competences or non-coordination in authorities; total control of the process from authorities and deficient participation.
Lack of adequate spaces and resources for dialogue	Lack of economic resources, time and personnel that delay and continuously modify decision-making; the prevalence of interest over another; decrease in discussion without having concerns and interests considered or monitored.
Lack of participants' motivation and will	Lack of legitimacy and public institutions' wear in society's eyes. It includes lack of trust in government stakeholders; lack of will to consider different points of view to those of authorities; demotivation, disenchant and frustration in non-government stakeholders.

Sources: Authors' elaboration based on the systematic review of the literature.

The characteristics and context of participants influencing decisions

The contextual particularities of stakeholders can become an element of inequality. These differences can be of the social class, gender, age, ethnicity, race, language or socio-economic status or even between the people who participate or not (Córdova-Bojórquez, 2005; Vázquez-García & Sosa-Capistrán, 2017; McCulligh & Tetreault, 2017). As an example, Ruiz-Meza (2011) studies how to challenge the strong cultural and ideological association between irrigation and masculinity to obtain rights to irrigated water and to participate in faire conditions in water management processes.

Also are included here the differences in access to resources (legal, economic, technological and free time) that can diminish the quality of participation, permanence or make short or long-term participation unsustainable (Sandoval, 2004). Similarly, the existence of social, religious or ethnic conflict within a community and between the interest groups or a hostile environment could generate in participants a lack of knowledge on water management problems or clarity on their objectives (Salcido, Gerritsen, & Martínez-Rivera, 2010; Wilder, 2010). These aspects can make it inflexible or less available for negotiation.

Different levels and clarity of information make debate difficult

Data and information are essential resources for negotiation and dialogue. Therefore, the low quality or in some cases the lack of them represent an obstacle to participation. In the process of public deliberation, technical and nontechnical knowledge in different groups and individuals are opposed each other. Thus access to information is necessary: when there is no transparency, or there are excessive bureaucratic procedures to produce or even access information of public interest, the debate among participants becomes limited and biased (Pells, 2015; Parra-Armenta & Salazar-Adams, 2018). Even when the information is accessible, on occasions, it is not updated, challenging to understand, find or is deficient.

The information needed to make decisions depends on the number of users, who they are, where they are located, how much water is in concession, how it is genuinely being extracted or used, how many are regulated or not, how much water is available, where the water comes from, among other things (Córdova-Bojórquez, 2005; Sandoval & Navarrete, 2005). The lack of information in the debate is related to an unclear methodology, the updating and frequency of production, the ability to monitor within time, the degree of added and unadded data and the clarity or reliability of the sources.

On the other hand, if the information on water management is excessively technical and there is no explanation of terms and jargon used, it becomes incomprehensible to the public. Furthermore, it is questioned whether public participation adds value to a decision since those people can increase their knowledge on specialized topics (Pérez-Fuentes, 2010). Consequently, the lack of information transparency, its quality, accessibility and technical language used, creates apathy in participants and decreases the quality of the process.

Clarity in the institutional arrangement for participation and decision-making

The institutional and legal design establishes the rules for decision-making and their later execution and evaluation. When participation is done without an appropriate institutional framework, the agreements between participants lack legal basis (Guerrero-de León *et al.*, 2010) and therefore, are not binding. The lack of clarity in the legal framework can translate into undefined competences between authorities or a form of non-coordination (Domínguez, 2011; Pells, 2015). An inadequate institutional and participation mechanism design can stop the groups of stakeholders from participating in defining the problem or even implementing and monitoring the final decisions and projects.

There are various limitations associated with the institutional arrangement: 1) a deficient calling that does not bring together the primary affected and interested stakeholders; 2) an excessive control from government agencies on the agenda; 3) the facilitator leads poorly; 4) communication remains strictly technical or inefficient with participants; 5) there are time and budget restrictions for the process development; 6) the rigid bureaucratic and hierarchical structures create barriers to social learning, and 7) the lack of clarity in competences generates a perception that the process does not produce tangible results (Hearne, 2004; Wilder, 2010; Eakin *et al.*, 2011; Ramírez *et al.*,

2016; Romero-Navarrete, 2016; Parra-Armenta & Salazar-Adams, 2018).

In Mexico, the criticism on the participative model falls on the State, where neither mechanisms nor organizations are mature enough to offer integral alternatives in response to the complexity of problems linked to water management. Mussetta (2009) states that the government stakeholders do not participate in organizing structures of the basin councils and organisms since there is not a sufficient opportunity to participate locally. In consequence, the mechanism does not guarantee democratization or the success of public policy.

The Mexican NWL reforms in 2004 had the intention to increase stakeholder's participation locally and transfer faculties and abilities to decide in regional matters. Sadly, this was not followed by fiscal resources needed to adopt these functions (Carabias & Landa, 2005). For example, the River Basin Councils lack the formal and legal structure, as well as the funding, to efficiently contribute to watershed level planning and management (Hearne, 2004; Kauffer, 2005; Wilder, 2010; Hernández-Suárez, 2011; Aguilar-Barajas *et al.*, 2016). Also, the Technical Groundwater Committees (COTAS) cannot express any act of authority regarding penalties, concessions or payment rights, and are limited to give advice and monitor on groundwater issues. As a result, water users are not well represented and legitimised and cannot establish mechanisms that bring about significant changes in groundwater use patterns (Maganda, 2003; Hearne, 2004; Sandoval, 2004; Wester *et al.*, 2009; Marañón, 2010; Caldera-Ortega & Suárez-Paniagua, 2015; Pells, 2015).

Efforts by committees and councils have not been enough to incorporate civil society into making decisions since 1) they lack superior faculties (they can only make recommendations); 2) there is no significant representation since the NWL does not consider social diversity of users or their organization abilities; 3) the civil society's, OSC's and academy's participation is tied to the invitation made by Conagua to the meetings as it finds fit (art. 15, fraction III of NWL Rules), hence keeping decisions "top-down" in hierarchy (Carabias & Landa, 2005; Scott & Banister, 2008; Wester *et al.*, 2009; Marañón, 2010).

Resources and spaces uphold dialogue

The people who organize participation spaces (e.g., water users) are facing a lack of available resources (time, budget, personnel, and others). First, all the affected and interested stakeholders in decision-making must be identified. As a result, participation creates slowness since there are more people to consult and more points of view must be addressed. Also, there is an increase in costs, time and modifications on projects for the politicians and those interested (Sandoval & Navarrete, 2005; Franco-García *et al.*, 2013).

In the conditions mentioned, the spaces for dialogue are reduced to consultative bodies without creating stable, reliable and efficient institutional channels for participation (Mussetta, 2009), or are instances where the distribution of power does not exist and the deliberation is limited to access to the voice but not to the vote (Hevia, Vergara-Lope, & Ávila-Landa, 2011). In other cases, in places with less education and organized structures that represent the community's interests, participation does not evolve past information distribution in which communication is an undirected flow towards those interested. Therefore, the participative mechanisms must be designed to avoid these conditions to emerge and to maintain financial sustainability (Sandoval, 2004; Parra-Armenta y Salazar-Adams, 2018).

The lack of motivation, trust and will diminish the effectiveness of participation

When participation becomes a requirement more than a right, then the rules are not clear, and the elite governs the process. Usually, misunderstandings and forms of manipulation arise, as well as a lack of

substantive progress or positive outcomes. The less influential stakeholders find themselves frustrated, hopeless and disappointed about participating in water management because opinions other than the governments are not considered. An example is the delay or absence of a response from authorities and the lack of transparency in decision-making which affects the trust put in the government and demotivation in participants (Córdova-Bojórquez, 2005). In this regard, participation is most effective when there is strong support from authorities.

Also, when defending individual interest becomes more important than the general, it produces inconsistent and irregular participation (Pérez-Fuentes, 2010). Dourojeanni (2004) discuss that the idea of "all" actors in a watershed management process should be represented is naive if everyone is expected to do so with the same interest. For this reason, the process can be caught by a group that does not represent all interests. These group dynamics (prejudice) can skew deliberation towards the elite's interests even when nobody is excluded physically.

When participants have perceived a need for change but cannot see their role clearly, they lose interest. Also, if authorities lack experience, they are not willing to learn. They are afraid to lose control and risk confidentiality of decision-making and all motivation to participate can be destructed. In those conditions, the interested parties doubt about their contributions making any difference in decision-making. Perló and Zamora (2017) find that the population of a microbasin are deeply skeptical of the effectiveness and reliability of the participatory spaces opened by the government, since they consider them manipulated to legitimize decisions previously taken by the same authority.

Marañón (2010), Vargas and Mollard (2005), Sandoval and Navarrete (2005) conclude that Conagua's unilateral decision-making about water management can inhibit public participation. Therefore, beyond formal procedures, ethics, motivation, trust and will from participants are necessary to attain effectiveness and changes in water use and consumption, perceptions, attitudes and usual practices.

Challenges of public participation in integrated water management

Literature indicates that there are still general obstacles for an inclusive, informed and joint responsible public participation. In response, the authors encourage taking on various challenges and elements here examined in three categories. The first one is related to an internal challenge (cognitive) and the second and third are external (context and the political system) (Córdova-Bojórquez, 2005). The categories of a guide to evaluate IPPWM are: 1) the merge of technical and non-technical knowledge; 2) decentralization and strengthening the abilities to make decisions, and 3) a real incidence of the non-government stakeholders in decision-making.

Merging of technical and non-technical knowledge

The collaboration between government, experts, water users and others interested, calls for sharing information that is useful for decision-making. Even when scientific information is relevant, awareness and water culture can be provided according to sociodemographic aspects (e. g. sex, age, income, dialect, residence time), water supply (e. g. education, and knowledge on water cycle, changes in attitude and water use practice, understating links between water management and other socio-economic problems, orientation for better agrochemical management, etc.), as well as facilitating or recognizing other technologies and agreements between participants (Barkin, 2006; Benez *et al.*, 2010).

As some examples of joining technical and non-technical knowledge/experience we have the case of the Yaqui Valley Irrigation District (Jacobs *et al.*, 2016), the civil water associations in Guanajuato,

also with their own capital and structure based on a network-supported structure of local initiatives (Sandoval, 2004), the local water committees (Guzmán-Puente, 2013; Sandoval-Moreno & Günther, 2013; Guzmán-Puente, 2017), the community participatory monitoring scheme (CPM) (Perevochtchikova et al., 2016) or the independent potable water committees/potable water local boards (Cadena-Inostroza & Morales-Fajardo, 2017), water judges and civil associations, where motivation may arise from an agreed-upon mutual need (self-water management, adaptive governance).

It is also important to keep in mind that the reported dimensions of rivers and aquifers are usually imprecise and frequently along international borders. This lack of knowledge and restriction in leadership makes sensitization and promotion of public participation more complicated. It is necessary to define results realistically from the beginning of the process. This way, the design of scenarios is a useful tool that can increase understanding from participants about common problems, increase their conscience and knowledge, and improve their ability to define their future.

Decentralization and strengthening abilities to make decisions

One of the challenges that literature exhibits most is altering the concentration of power from authorities and sharing it with those who do not have jurisdiction over water management. One of the reasons is that urban and rural development management must be incorporated into participative water management. Therefore, the interest of various stakeholders from both fields must reconcile.

Increasing participation quality and quantity means that stakeholders will be more informed. Thus, improving transparency, accountability and access to information is essential for water governance. Another challenge is applying the communicational tools correctly, informing in real time the specific necessities of the interested or to have a saying in

water management and promoting coordinated decisions between the different levels, so that it is not only a "vertical", but mostly an integrated management (Domínguez, 2011; Hernández-Suárez, 2011).

One of the most critical challenges here is related to reaching consensus and agreements among the affected and interested stakeholders on the problems related to water, so each sector takes responsibility in decision-making and monitoring of planned actions (Domínguez, 2006). Some aspects to consider could be decision-making process and directive, applicable legal framework, water programs and plans design, participation rules, mechanisms, and degree, as well as stakeholders' representation.

In summary, although there are participative mechanisms that incorporate different social and economic stakeholders that seek deliberation locally and regionally, in practice, decentralisation is an unending process where they have no real authority, autonomy, nor budgetary power, making unrealistic expectations of common property management and self-governance, which are critical for water management, quantity and quality control and also for quality of community life (Maganda, 2003; Hearne, 2004; Cadena-Inostroza & Morales-Fajardo, 2017). For this reason, it keeps concentrating power in government stakeholders and federal authorities (Romero-Navarrete, 2016). Then, it is vital to reform the laws and regulations to provide participatory mechanisms with legal and operational certainty, which allows them to have the necessary autonomy to significantly impact the watersheds and their inhabitants (Parra-Armenta & Salazar-Adams, 2018). This is due to the institutional design and the lack of promotion for developing the abilities of new stakeholders that also take part in the decision-making process.

Real incidence of the non- government stakeholders in decision-making

Among the most significant challenges for public participation in water management is the issue of promoting social learning, leadership, motivation and political will. In Mexico, social and governmental stakeholders can produce successful negotiations where basin and aquifer organizations can find spaces to fit (Vargas & Mollard, 2005). These considerations involve improving institutional agreements in practice and ideals of water governance, adaptive or collaborative governance (Amaya-Ventura, 2011; Pells, 2015), where decision-making includes all affected participants.

Identifying appropriate timings and mechanisms to involve the public in water management remains a permanent challenge (Romero-Navarrete, 2016). In Mexico, watershed and aquifer organizations find themselves very limited to participate directly and actively to improve their administration. They lack strength, economic self-sufficiency and only serve as advisers/information centers for water monitoring and technology transfer to benefit users and they have not the ability to implement water management plans and their rules (Kauffer, 2005; Sandoval & Navarrete 2005; Wester *et al.*, 2009). They only mediate and represent water user needs to Conagua and try to prevent conflicts and collaborate on resolutions (Pells, 2015). Then, public participation in water management needs mechanisms to ensure the legitimacy and accountability of user's representatives to both users and state agencies (Wester *et al.*, 2009), where non-government stakeholders can actively work on reducing groundwater extractions, monitor water quality and quantity or find the ways to influence water management according to Conagua and its agenda.

Conclusions

In the last three decades, the academic arguments in favour of the implementation of social participation mechanisms for water management have reached a high degree of development and

sophistication for two main reasons: 1) it is a mechanism that integrates different social stakeholders in decision-making process; and 2) it has become a requirement to improve water management at the local level. In the present article, we include arguments that support public participation from the legal basis, the theories on democratic participation and governance, and the substantive benefits that a participatory process can have. Nonetheless, after decades of the instrumentation of participatory practices, these mechanisms present difficulties to become competent in water resources management. Our objective was to highlight the great distance (gap) between what the legal texts and international recommendations say about participation, and what it happens in reality.

The issue is whether a post-participative consensus can be achieved. During the last two decades, the Integrated Water Resources Management (IWRM) and the development of participative processes in Mexico were incorporated, under the following argumentative consensus: the water management characterized by complex interactions where a variety of interests, stakeholders, environmental characteristics, and political and economic tendencies converge. Against this, scientific and technical contributions are not enough. Therefore, the participation from affected and interested stakeholders can contribute to improving the quality of decisions in management, enhance the quality of management outputs, add non-governmental resources and abilities to the process, and generate knowledge about the area in the political community. However, after two decades of practice of participatory mechanisms, the argumentative consensus that justified its implementation reached its limits to understand the variety of problems that have arisen around these arrangements. Consequently, a new argumentative consensus has been achieved in the Mexican academia: Foreseeing the mechanisms for participating in legislation and its instrumentation with a procedural purpose is not only insufficient to reach the expected benefits but can produce more conflicts between stakeholders and inefficiency in water management.

As a result, we consider that the discussion on the matter should not be focused on whether participation is a useful mechanism or not, but on how participation mechanisms are designed, managed, and implemented on different scales and cultural contexts. The empirical

investigation in Mexico can bring some insights to improve the design of participatory mechanisms: 1) the characteristics and background of participants must be considered; 2) participants have different level and quality of resources; 3) in some cases, participants do not have enough resources to face participative processes; 4) the legal framework should be consistent, and it should include explicit competencies and responsibilities as well as substantial institutional capacity from the promoter, and 5) an inadequate management of participation processes can decrease the interests of stakeholders in the process and the legitimacy of management outputs. Based on these findings, we propose that the further studies in the matter investigate how these factors influence participation processes that develop in particular contexts, and from this, make recommendations to improve the existing participative mechanisms.

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