

Participation in groundwater governance – outlining a path to inclusive development

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Abstract

Although there is considerable research on participation, there is little that combines the relationship between access to information, participation and access to justice and how these can be combined to enhance groundwater governance. Hence, this article addresses the question: How can legal frameworks that recognize the right to participation alleviate local groundwater governance problems in different contexts? In order to address this question, this article reviews the literature on participation, law, policy and inclusive development and analyses selected legal frameworks that recognize participation, access to information and access to justice to determine how these frameworks have been implemented in groundwater governance. The selected contexts include Australia and Costa Rica. The findings show that (i) access to information, participation in decision-making and access to justice are mostly employed in a reactive manner to solve groundwater governance problems; (ii) access to information on groundwater ignores particular features of groundwater resources, such as ‘invisibility’, ‘irreversibility’ especially in relation to fossil resources, the local nature, and limited consensus on the data; (iii) meaningful participation is unlikely until information, learning, knowledge, and awareness about groundwater resources is popularized and (iv) factors enhancing access to information and participation in decision-making in groundwater governance include the existence of a water crisis, leadership, government funding dedicated to organize participatory processes; and small-scale and homogenous communities.

Keywords: Access to justice; Groundwater governance; Inclusive development; Participation

1. Introduction

While the concept of participation has been extensively discussed in the literature, especially since Arnstein’s (1969) ladder of participation and many scholars have engaged with how the legal and policy system enable participation in water management and governance at different levels (Razzaque, 2009) not much has been said in relation to groundwater governance (Varady *et al.*, 2013).

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This article examines legal frameworks that recognize the right to participation, particularly in groundwater governance for the following reasons. First, groundwater is the largest store of fresh water on Earth. Its extraction rates have exponentially grown over the past 50 years. Second, groundwater has intrinsic particularities, which makes participation complex (e.g. invisibility). Third, groundwater use has often been incentivized or subsidized in order to alleviate poverty (especially in developing countries).

Although most industrialized countries have adopted policy and legal frameworks regarding groundwater use, management and governance (Gupta & Conti, 2017), most developing countries rely on customary groundwater rules and have few policies and laws to tackle the more complex challenges facing groundwater today (Ballesteros *et al.*, 2007; Shah, 2009), which is surprising given that groundwater plays a progressively important role for drinking water, food and energy production and climate resilience (Shah, 2009).

Regardless of whether groundwater usage has been firmly embedded in governance and law, groundwater users are increasingly involved in the making and implementation of decisions regarding groundwater as these decisions affect them. The participation of these users has become a steady feature of contemporary groundwater governance (Burchi, 2018).

This paper addresses the question: How can legal frameworks that recognize the right to participation alleviate local groundwater governance problems in different contexts? This paper uses two research methods. First, it draws on a desktop analysis examining international instruments and scholarly literature on the content of access to information, participation in decision-making, access to justice and inclusive development and then assesses policies and laws on the environment, surface and groundwater at the national level in Australia and Costa Rica, the two countries examined. It then undertakes four case studies, which rely on 80 in-depth qualitative interviews with government bodies, groundwater users (e.g. farmers), scientists, businesses, and non-governmental organizations (NGOs). These interviews provide insights on how government officials and non-government actors have participated in addressing groundwater problems at the local level. To illustrate contrasting situations on how and to what extent legal frameworks recognizing participation can alleviate local groundwater governance problems, this article uses Australia and Costa Rica. Australia has up-to-date laws and policies while Costa Rica continues to struggle to design effective water laws and policies. Despite such differences, the two countries are similar; for example, both have comparable democratic systems that seek to implement access to information, participation in decision-making and access to justice in environmental issues, including groundwater issues.

Following this introduction, Section 2 discusses the current legal and policy content of participation. Section 3 explains the existing legal and policy mechanisms used in Australia and Costa Rica in order to facilitate participation in groundwater issues. Section 4 brings to the discussion the case studies and analyses the manner in which considerations relating to participation have arisen in Australia and Costa Rica. Section 5 assesses how and to what extent legal frameworks recognizing participation can alleviate local groundwater governance problems in different contexts.

2. Theoretical framework

This paper combines law, policy and development studies. It incorporates the literature on participation (e.g. traced back to Arnstein, 1969; Pateman, 1970) and combines it with relevant legal literature (Kothari, 2007; Razzaque, 2009), and how policy instruments have recognized the right to participate in environmental issues (e.g. the [Rio Declaration on Environment and Development, 1992](#)). Finally, the paper takes inspiration from the emerging body of literature on inclusive development

(Gupta *et al.*, 2015) which argues that the idea of development should include social inclusiveness (human well-being), environmental sustainability, and relational inclusiveness (including empowerment of the marginalized) (Pouw & Gupta 2017). The relational aspect aims to change power relations between people, and this can be achieved, *inter alia*, by participatory processes. Inclusive development is a key concept in Agenda 2030 but has been defined as a countervailing idea that questions the centrality of economic growth within the interpretation of sustainable development (Gupta *et al.*, 2015).

Participation has many definitions, typically underpinned by the normative ideals of democracy and equity. For Arnstein (1969), for instance, participation involves ‘the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future’, while Pateman (1970) defines participation as referring to ‘[equal] participation in the making of decisions’. According to these two rather normative definitions, participation should be about redistribution of power among all people, with everyone enjoying an equal opportunity to be part of the decision-making process. Arnstein also emphasized that participation as a concept can be misused when it is used to manipulate others and that there is a ‘ladder’ of increasing participation interpretations. Other bodies of literature have also discussed that participation is not always necessary as in the case of highly structured problems or that it is unable to lead to quick solutions in the case of unstructured problems (Hurlbert and Gupta, 2015). This paper goes from the starting point that moderately unstructured problems, such as groundwater governance problems, can benefit from participation in different ways. The paper also reflects on the role of participation in changing power relations between people as a way to approach inclusive development.

2.1. Participation in international instruments

The requirement of participation in environmental and natural resource governance has long been recognized in international policy and legal instruments. As enunciated in Principle 10 of the 1992 Rio Declaration on Environment and Development:

‘Environmental issues are best handled with the participation of all concerned citizens, at the relevant levels’.

Principle 10 then goes on to spell out what ‘participation’ requires:

‘At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities including information on hazardous materials and activities in their communities and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided’.

As is immediately apparent, this formulation of participation in environmental issues articulates at least three elements. First, each individual should have appropriate access to environmental information held by public authorities. Second, concerned citizens should have the opportunity to participate in decision-making processes. Third, Principle 10 acknowledges that this should be complemented by providing effective access to judicial and administrative proceedings when needed.

The procedural rights embodied in Rio Principle 10 have been incorporated into and developed by a number of subsequent binding international instruments (Razzaque, 2010). For example at the global level, different treaties have dealt with this challenge differently. General Comment 15 (2002) interprets Articles 11 and 12 of The [International Covenant on Economic, Social and Cultural Rights \(1966\)](#) by stating that:

‘the right of individuals and groups to participate in decision-making processes that may affect the exercise of the right to water, must be an integral part of any policy, programme or strategy concerning water. Individuals and groups should be given full and equal access to information concerning water, water services and the environment, held by public authorities or third parties’.

The [Ramsar Wetlands Convention \(1971\)](#) and its plans and resolutions have urged governments to take the views of local people into account by promoting their participation. The [Framework Convention on Climate Change \(1992: Art. 6\)](#) focussed on the importance of education, training and public awareness. The [Biodiversity Convention \(1992\)](#) has several articles that deal with participation in relation to different issues (Arts. 14, 15, 19, 23, 25; preamble). The [Convention to Combat Desertification \(1994: Art. 3\)](#) requires Parties ‘to ensure that decisions on the design and implementation of programs to combat desertification and/or mitigate the effects of drought are taken with the participation of populations and local communities ...’. This builds on the concepts articulated in the 1992 Climate Change Convention which outlines States Parties’ responsibilities to promote and facilitate, *inter alia*, education, public awareness, public access to information, public participation training and international cooperation with respect to addressing the climate change and its effects. A more comprehensive development is the [Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters \(Aarhus Convention, 1998\)](#). Although originally adopted under the auspices of the United Nations Economic Commission for Europe (UNECE), the Aarhus Convention aims to become a global convention and is open for ratification by states outside the UNECE region.

As many authors have pointed out, it is difficult to argue that the elements established by Rio Principle 10 and the Aarhus Convention have achieved the status of customary international law. Nevertheless, its adoption in an increasing range of international agreements and its growing incorporation into domestic laws suggests that the right(s) may well be consolidating in customary national and international environmental law (Duvic-Paoli, 2012).

Regardless of its customary status, the recognition of the importance of public education and awareness as being a key to effective and equitable climate policy and governance in the UNFCCC, to which both Australia¹ and Costa Rica² are parties, provides a useful model that these countries could follow to implement basic participation in the climate change context and has direct implications for groundwater resources and overall environmental protection (IPCC, 2007). Razzaque (2009) argues that international and regional organizations have increasingly emphasized the importance of participation in water governance which has its roots in international human rights law and can be increasingly found in international and regional environmental agreements and in river basin policies and organizations. Thus, increasingly, international law recognizes the importance of including interested parties in the

¹ Signature 4 June 1992, Ratification 30 December 1992.

² Signature 13 June 1992, Ratification 26 August 1994.

decision-making process in environmental matters. This inclusion, often clustered in the right of ‘participation’, includes access to information, participation in decision-making and access to justice (e.g. judicial and administrative proceedings).

Taking into the discussion access to information, participation in decision-making and access to justice, this article examines how and to what extent legal frameworks recognizing participation can alleviate local groundwater governance problems.

3. Policy and legal frameworks on participation: Australia and Costa Rica

In order to examine how and to what extent legal frameworks recognizing participation can alleviate local groundwater governance problems, it is necessary to look in detail in specific jurisdictions. This section introduces the legal and policy frameworks on the participation of Australia and Costa Rica.

3.1. Australia – national framework on participation

The importance of participation in surface and groundwater governance³ is alluded to in the [2004 National Water Initiative \(NWI\)](#) (Cth) and in the [2007 Water Act](#) (Cth). Paragraph 36 of the NWI states:

‘Recognising that settling the trade-offs between competing outcomes for water systems will involve judgements informed by best available science, socio-economic analysis and community input [emphasis added], statutory water plans will be prepared for surface water and groundwater management units in which entitlements are issued (subject to paragraph 38⁴). Water planning is an important mechanism to assist governments and the community to determine water management and allocation decisions to meet productive, environmental and social objectives’.

With respect to access to information, paragraph 40 of the NWI requires the ‘[p]rovision of regular public reports relating to the implementation of water plans to assist water users and governments to manage risk’. Moreover, paragraph 93 provides for ‘[e]nsuring sound information is available to all sectors at key decision points’. Furthermore, paragraph 96 provides that ‘States and Territories agree to provide accurate and timely information to all relevant stakeholders regarding: progress with implementation of water plans...’. In this respect, the incorporation of access to information is even more obvious.

Regarding participation in decision-making, paragraph 93 makes it clear that a critical purpose of the NWI is to engage water users and other stakeholders in achieving the objectives of the NWI through ‘transparency in decision-making’. Paragraph 95 mandates that ‘States and Territories agree to ensure

³ Other well-known examples of this, in Australia, are the regional natural resources management initiatives. Several of these initiatives state that participation should be a fundamental aspect of natural resources management design. For further discussion, see [Holley \(2010\)](#).

⁴ Paragraph 38 states that, ‘the relevant State or Territory will determine whether a plan is prepared, what area it should cover, the level of detail required, its duration or frequency of review, and the amount of resources devoted to its preparation based on an assessment of the level of development of water systems, projected future consumptive demand and the risks of not having a detailed plan’.

open and timely consultation with all stakeholders in relation to ... significant decisions that may affect the security of water access entitlements or the sustainability of water use'. Moreover, paragraph 97 establishes that states and territories agree to address significant adjustment issues affecting water access entitlement holders and communities that may arise from reductions in water availability as a result of the reforms proposed in the NWI, thus, 'States and Territories will consult with affected water users, communities and associated industry on possible appropriate responses to address these impacts ...'.

Moreover, one of the key objects of the [2007 Water Act](#) (Cth) is to '[g]ive effect to relevant international agreements (to the extent to which those agreements are relevant to the use and management of the Basin water resources ...)'. Even though the common interpretation of this provision is to give effect to treaties related to sustainability, it could be argued that it is also important to give effect to international agreements regarding education and public awareness, which tend to facilitate participation such as the United Nations Framework Convention on Climate Change ([UNFCCC, 1992](#)), which Australia signed in 1992 and ratified in 1994. The 2007 National Water Act has also included the importance of public consultation in the elaboration of water resources plans. Having said that, the policy documents do not clearly state how decisions will be actually made and it is not very clear where exactly the policy fits in the ladder of stakeholder participation.

In regard to access to administrative and judicial proceedings, Australia guarantees such possibility in relation to water issues. Perhaps the most prominent of these proceedings challenges the validity of planning decisions, such as water allocation plans (WAPs) by judicial review⁵ on the basis of arguments of procedural fairness⁶.

However, as will be shown with the case studies, in Australia, the elements of access to information and participation in decision-making have been more commonly used in groundwater issues. The next section discusses the state-level frameworks.

3.1.1. The state level – South Australia and Western Australia. At the state level, South Australia and Western Australia have included participation in groundwater policy and legal frameworks. For example, the [2004 Natural Resources Management Act \(NRMA\)](#) has included the promotion of education initiatives and support mechanisms to increase the capacity of people to be involved in the management of natural resources in its objectives (Section 7). The NRMA also establishes that the preparation and maintenance of the WAPs should involve consultation (Section 79). Similarly, in Western Australia, the principal legislation for regulation, management, use and protection of surface and groundwater resources, the [1914 Rights in Water & Irrigation Act \(RWIA\)](#), has recognized the importance of participation. For example, this Act aims to foster consultation with local communities and to enable them to participate in water resources planning.

Critical to the effective implementation of the principle of participation are the formal participatory mechanisms adopted to ensure its attainment. Broad policy and legal goals are achieved through the adoption of specific regulatory frameworks and concrete mechanisms of implementation such as the WAP in Australia.

⁵ Judicial Review in Australia is done at the State and Territory level.

⁶ This means that an appeal can be presented to discuss the manner in which such a government decision was taken.

3.2. Costa Rica: the national framework on participation

Costa Rica lacks an adequate water law. The current water law is from 1942, when participation was not yet contemplated in water management and water governance. Therefore, to understand how participation has been recognized, it is necessary to examine other more recent regulatory and policy instruments, where the importance of participation in natural resource governance in general and in water governance in particular is included. These instruments are discussed below.

Article 6 of the [1995 Organic Environmental Law](#) (Law No 7554) emphasizes the responsibility of the state and the municipalities in ‘encouraging the active participation of the inhabitants of Costa Rica in decision-making in relation to the protection of the environment’. Moreover, according to Article 5 of the [1998 Municipal Code](#) (Law No 7794), the municipalities have to ‘encourage the active, conscious and democratic participation of people in the decision-making of the local government’. These two legal frameworks include participation in decision-making. Another example of a law that endorses participation in water issues is the Constitutive Law of the Costa Rican Institute of Aqueducts and Sewage, Law No. 2726 of [1961](#). Article 2 g of the aforementioned law establishes that the Costa Rican Institute of Aqueduct and Sewage (AyA)⁷

‘may agree with local agencies, the administration of water services or manage them through administrative boards of mixed integration between the Institute and the respective communities, whenever this is convenient for a better delivery of services and in accordance with the respective regulations’.

Thanks to this law, communal water associations were created. Note that AyA is the organization responsible for overseeing all issues related to drinking water and sewage. AyA is known as the ‘mother’ of these communal water associations, which are mainly regulated by the Ordinance of the Administrative Associations of Water and Sewage Systems (ASADAs)⁸, Executive Decree No. 32529-S-MINAE. This Ordinance provides several provisions to further enhance the participation of the entire community in water issues. Article 21 establishes the duties and responsibilities of the ASADAs. Article 21.3 says that the ASADAs have to ‘actively participate with the community in the construction, administration ... and in the preservation and conservation of water resources’. Article 21.11 indicates that the ASADAs have to ‘call for an assembly for associates to discuss issues regarding water and sewage systems that need communal action’. Moreover, Article 21.12 states that ‘the ASADAs must perform periodic reports to the community of the proceedings with relation to the operation, maintenance and development of systems’.

In contrast to Australia, Costa Rica does not have a holistic formal participatory mechanism, such as the WAP, which facilitates the fulfilment of participation. Rather, in Costa Rica, communities have used ‘alternative instruments’ to exercise their right to participate. On one hand, they have used the legal entity of the ASADA, and on the other hand, they have taken recourse to access to justice (see 4.2).

⁷ This is its Spanish acronym.

⁸ This is its Spanish acronym.

4. The case studies

This section examines in detail how and to what extent legal frameworks recognizing participation can alleviate local groundwater governance problems in the different contexts of an industrialized and a developing country.

4.1. A case study on access to information and participation in decision-making in groundwater governance (Angas Bremer, South Australia)

Angas Bremer is located 60 kilometres south-east of Adelaide, the capital of South Australia. It is named after the Angas and the Bremer rivers which flow through it. Due to the cultivation of several crops (e.g. lucerne and potatoes) and other extensive farming practices (e.g. dairy), groundwater resources became increasingly saline in the late 1970s (Thomson, 2008). The community is basically made up of 180 small irrigators and their families. Interviews revealed that most people in Angas Bremer have similar interests (e.g. improved irrigation systems that use less water) and values (e.g. nature protection). They also have a strong community organization and recognized local leaders (e.g. former mayors). These interests mirror the existence of ecological, social and relational inclusiveness in Angas Bremer.

Participation in the Angas Bremer focuses on access to information and participation in decision-making. The relational aspect of inclusive development as illustrated in this case study aims to change power relations between people and this was achieved by participatory processes. The irrigators are organized in the Angas Bremer Water Management Committee, which has played a significant role in bringing about an important reduction in groundwater allocations since the 1980s. It also ensures that annual reporting of extractions and other activities now takes place. In addition, an Irrigators Code of Practice has been adopted, and monitoring wells are now used to measure and to report the height and salinity of the water-table (Cuadrado-Quesada, 2018).

Respondents suggested that the meetings were open and that the government officials were willing to engage in discussion and pursue a rough balance of interests. This was clearly evidenced by the inclusion of irrigator's initiatives such as metering, monitoring, annual reporting and revegetation in the WAP. In this case study, government agencies financed the provision of information (through open meetings), as a first step to encourage people to then participate in decision-making in groundwater use and protection. Interviewees mentioned that government officials explained particularities of groundwater such as slow recharge rates and growing concentration of pollutants. This allowed awareness and knowledge to grow in this case study. This suggests that in terms of access to information and participation in decision-making, the consultation processes enshrined in the NRMA (see 3.1) enabled the Angas Bremer region to achieve considerable participatory success. This in turn facilitated the possibility of changing power relations between people and make them more inclusive. In this case study, it was evident that the participation of the irrigators in the adoption and implementation of the WAP helped them to move toward a better way to use groundwater and address some of the existing problems. However, the findings suggest that this success was attributable not only to the existence of policy and legal frameworks and forums/meetings (consultations), but also to a range of factors that ensured access to information and participation in decision-making. Four key factors were identified, namely the existence of a groundwater crisis which mobilized people, leadership which channelled the energy of the mobilized people, and the involvement and funding of government institutions. The fact that the community was small and homogenous enabled easier consensus building.

Although the ABWMC has had outstanding leadership and success in accessing information and participating in decision-making, the ABWMC is facing noteworthy challenges as of 2018. First, there is a decline in community participation in surface and groundwater governance, because the issues that had sparked community engagement have been resolved; that is, the crisis has passed. Second, the ABWMC is facing reduced funding as a result of austerity measures of the South Australia government. This last aspect is a major challenge to social inclusiveness even in industrialized countries.

4.2. A case study on the importance of access to information in groundwater resources (South West, Western Australia)

The South West area of Western Australia is located about 200 kilometres south of Perth, the capital city of Western Australia, and is inhabited by approximately 158,500 people. Comparable to South Australia, the Western Australia case study reveals efforts to fulfil participatory rights, including access to information and participation in decision-making in the groundwater context through WAPs. However, this case is different from the Angas Bremer in several ways.

As shown by the interviews conducted during fieldwork, interested people in the south west of Western Australia were able to access the information regarding the main groundwater problems in the area (e.g. climatic changes have increased pressure on groundwater resources). Many believed that the process of developing the WAP included some level of participation. The participatory process led to the creation of an advisory group. These kinds of groups show a possible way, used in the south west, to promote social inclusiveness as well as relational inclusiveness.

Interviewees explained that the information provided to the public included an outline of the main problems in the area and how the WAP would help them face the main issues such as over-allocation of groundwater. A prominent factor found in this case study, similar to the Angas Bremer case that contributed to the achievement of participation, was government funding. The existence of participatory processes fosters the possibility of achieving the relational aspect through changing power relations between people. The Western Australia government invested considerable funds to facilitate participation in the development of the WAPs. Despite the apparent success of information accessibility and the existence of an advisory group, stakeholders identified some shortcomings in the outcome of the process, namely that important recommendations/concerns submitted by key stakeholders were not included in the plan. The main difference with South Australia is that in Western Australia the WAPs are not statutory, which according to some scholars might hinder their effective enforcement (Hamstead *et al.*, 2008). Therefore, even though participation is recognized in the WAP, some authors argue that because the plans are non-statutory, there is no statutory requirement to follow up on these provisions (Bennett & Gardner, 2015). Another aspect that seems to be affected by non-statutory planning is that of ecological inclusiveness. As water planning in Western Australia is done through non-statutory surface and groundwater allocation plans, such plans do not create legally binding obligations. In other words, ecological targets are not binding. Incentives to comply are also limited, this promotes a situation which leads down the path of over-exploitation of groundwater (Cuadrado-Quesada, 2018).

Furthermore, this region is facing challenges in achieving participation as well as social inclusiveness due to two other reasons: First, the limited perceived impact of groundwater problems, as in this case study most local people have not been directly affected by water availability, although Western Australia is being seriously affected by climate change resulting in less recharge from rainfall reaching the groundwater system every year, and the situation is expected to worsen (CSIRO, 2009). Second, a factor limiting

the extent of participation as well as social inclusiveness is the large size of the geographical area consisting of heterogeneous communities. As also revealed by the interviews, the government found it difficult to ensure sufficient representation of interests of organized groups and individuals.

4.3. A case study on access to justice to protect groundwater resources (Guácimo, Costa Rica)

Guácimo is located in the province of Limón in the Caribbean of Costa Rica. The communities in Guácimo total about 40,000 people. Guácimo and other cantons in the Caribbean, and also in the Northern Zone and in the Southern Zone of Costa Rica, have been affected by a massive expansion of pineapple plantations⁹. Costa Rica has become one of the world's leading pineapple producers, and the world's number one exporter of the fruit (Cuadrado-Quesada, 2014). Although economically valuable, the pineapple boom has brought many environmental problems to the country. These adverse effects include land use change and deforestation of large areas of previously forested land, effects on land availability for other crops and for livestock rearing, erosion, and surface and groundwater pollution due to intensive use of agrochemicals.

Guácimo community leaders were concerned about this situation and used access to justice as a way to address such concerns. This case study discusses in particular an environmental lawsuit against one pineapple plantation called *Agroindustrial Ticoverde S.A.* This pineapple plantation is located in the community of *La Perla* in the high parts of the canton. The lawsuit argued that the pineapple plantation was, among other things, changing land use, eroding the soil and invading the protected areas of the aquifers (Article 33 of the 1995 Organic Environmental Law, Law No 7554). The lawsuit was successfully won in 2013, with the judges requiring the plantation to '[r]emove the pineapples that were invading the protected areas of the springs' (Resolution Environmental Prosecutor, No. 24536-2013), which represented almost the entire plantation.

Interviews revealed that the perceived groundwater crisis was an important factor that motivated people to exercise their participation and environmental rights, which in this case study took the shape of access to a judicial proceeding. The groundwater problems ran parallel to environmental problems, which are related to the 'pineapple boom' that started in the Caribbean back in the early 1990s (Cuadrado-Quesada, 2008). Interviewees also indicated that Guácimo had enlightened leaders who were aware of groundwater pollution in neighbouring communities and in the south of the country, where a similar 'pineapple boom' took place in the 1980s, and decided something had to be done to avoid this problem in their community. These leaders were motivated by self-interest because they did not want to have their drinking water polluted, but also by awareness and knowledge of the vulnerability of groundwater resources.

In Guácimo, the problems are caused primarily by private companies – most of which are subsidiaries of transnational corporations that only pursue profit-making for shareholders (e.g. Del Monte and Chiquita) and by government agencies that are negligent. This case study demonstrates an evident lack of social, ecological and relational inclusiveness. It shows a clear exclusion of most people in decision-making, considering only the interest of the big pineapple corporations. It also shows how natural resources (including land and water) were used in an exploitative manner with the only aim of gaining

⁹ Historically, Costa Rica has been environmentally and socially affected by agricultural plantations such as coffee, bananas and more recently pineapple.

profits for a few. This shows a clear imbalance in power relations, which are fundamental to the possibility of relational inclusiveness.

This explains why, for example, in the Angas Bremer case study, the irrigators and the community were able to participate and to find solutions to many of the problems, while in Guácimo problems continue. Finally, another factor that contributed to the achievement of the success (albeit limited) of the legal proceeding was that Guácimo is a small-sized homogenous community, where most people agreed to stop unsustainable and exclusive development. In this case study, the element of access to information and participation in decision-making were clearly absent. Although inclusive and sustainable development is a key concept in Agenda 2030 so far, it has proven to be an elusive goal in most countries and communities around the world.

4.4. A case study on access to information and participation in decision-making in communal water boards (coastal communities of Santa Cruz, Guanacaste)

The coastal communities of Santa Cruz, Guanacaste province are located in the North Pacific of Costa Rica, which is one of the driest areas in the country. These communities are located in a coastal paradise that has been affected in the past decades by unplanned and widespread growth in tourism and associated real estate development (Cuadrado-Quesada *et al.*, 2018). This growth has not taken the vulnerability of the area in terms of water scarcity and climate change conditions, for example, into account. The region receives significant rainfall for only three months annually, which causes poor water availability (Kuzdas *et al.*, 2016). Therefore, there is approximately 88 per cent reliance on groundwater in this province (Astorga-Espeleta, 2013).

Communal water associations or ASADAs have existed in these coastal communities for a long time. They were formed by community members who were interested in responding to the need to provide water to the emergent coastal communities back in the 1950s (Monge *et al.*, 2013). Since then, the ASADAs have been in charge of the drinking water supply in their communities. More recently, the ASADAs have expanded their responsibilities and currently they are not only limited to the drinking water supply but are also involved in the overall governance of surface and groundwater. Note that the ASADAs are not only functioning in these coastal communities but also in many other rural areas. They include/represent nearly 30% of the country's population and represent an increase in national access to improved water sources of 28% from 1980 to 2012 (Dobbin & Sarathy, 2015).

Interviewees argued that the ASADAs have provided interested people with relevant information about groundwater issues and fostered participation in decision-making. The ASADAs hold at least one public meeting annually; however, when there are pressing issues (e.g. shortages), they conduct several extraordinary meetings. In both these kinds of meetings, the ASADAs tend to present significant information about surface and groundwater resources. Particularly when discussing groundwater the ASADAs include information such as slow recharge rate and vulnerability. This has promoted awareness and knowledge. Additionally, the ASADAs discuss with the community what to do with pressing problems and how to resolve them. Everyone has the opportunity to present their concerns, and decisions are mostly taken by consensus.

As in the Angas Bremer and Guácimo cases, the fieldwork revealed that a crucial factor that encouraged the coastal communities of Santa Cruz to participate in groundwater governance through the ASADAs, by attending meetings and expressing their opinions and concerns, was the realization that they were suffering a number of groundwater problems. Currently, these communities experience

serious challenges regarding groundwater quantity, especially during the dry season due to the lack of rainfall (Kuzdas *et al.*, 2016), but also because of poor investment by the government in the last few decades (Cuadrado-Quesada *et al.*, 2018). The fieldwork also showed that the ASADAs have created several mechanisms to promote ecological inclusiveness, which include protection areas to prevent pollution and deterioration. The ASADAs have started to purchase strategic land in order to create protection areas, where only reforestation activities are allowed. To date, these actions are somewhat limited in scope; however, they point to both an awareness of the significance of clean groundwater and a desire to ensure their sustainable use and governance.

The interviews show, as was found in the Angas Bremer and Guácimo case studies, that participation is facilitated by proactive community leadership. In this particular case study through the figure of the ASADAs, the coastal communities have charismatic leaders who have convinced almost everyone to participate in groundwater governance. The main leaders of the coastal communities were the members of the executive boards of the ASADAs. These leaders have met with people from the communities to explain the importance of groundwater, e.g. its role in storing fresh water, its slow recharge rate, and inequities in access to water and how they can all work together to find possible solutions.

The interviews showed further, as was the case study of the communities in the Guácimo and in the Angas Bremer, that the small-scale and homogenous nature of the communities including 35,000 people facilitated participation. The interviews also show that, as was found in the Guácimo and Angas Bremer case studies, the Santa Cruz coastal communities are affected by budget limitations. This is especially a problem of time and money for the members of the ASADAs who work *pro bono* and have had only limited government funding. This affects participation, mainly because the lack of technical information diminishes the capacity of the ASADAs to provide updated and accurate information about groundwater resources (e.g. monitoring on quantity and quality). If the ASADAs do not have that information, they cannot provide it to the communities. Overall this case study illustrated the existence of elements (albeit limited) of social, ecological and relational inclusiveness. Social and relational inclusiveness are clearly linked to the figure of the ASADAs and its participatory nature where everyone has a voice and a vote. The ecological inclusiveness is also closely linked with the measures taken by the ASADAs to protect the environmental and groundwater resources, such as creating protection areas around the aquifers.

5. Conclusion

This paper has argued that access to information, participation in decision-making and access to justice are three key elements that can empower people in the governance of resources including groundwater resources. It is fundamental that access to information takes into account particular features of groundwater resources, such as invisibility, irreversible declines in the short and medium term, the specific local nature, and limited consensus on the data because if this does not happen, participation will most likely not occur. Understanding groundwater is fundamental to develop learning, knowledge and awareness about this invisible natural resource. This paper has asked how and to what extent legal frameworks that recognize the right to participation can alleviate local groundwater governance problems in different contexts. The findings of this research demonstrate that most people (in industrialized and in developing countries) would indeed prefer to participate using access to information and participation in decision-making; however, when these two rights are missing or inadequate, as demonstrated by the Guácimo case study, people will not hesitate to access courts

through environmental litigation accompanied by the strength and persistence of civic leaders. This involves a higher investment of time and money for the entire country and should be used with caution. Noteworthy is to mention that access to judicial proceedings can lead to participation and inclusive development, if after the judicial proceeding there is a change in policy, in power relations and in governance instruments; however, this did not happen in the Guácimo case study. The Guácimo case study illustrates a small success in accessing the court and winning a partial demand but demonstrates failed participation as well as failed social inclusiveness. This case study clearly showed an overall unsustainable and exclusive development. The other three case studies mirror to some extent the exercise of participation and the presence of ecological, social and relational inclusiveness.

The four case studies also suggest that some factors require and/or enable participation. The existence of water problems is critical for mobilizing people; leadership helps to channel the energies of the mobilized people; and government funding enables richer participatory processes. When the communities affected are small-scale and homogenous, the likelihood of successful consensus outcomes are higher as problem structuring becomes much easier. The case studies also reflect on impacts of diminished or no government funding, and note that when there are large-scale and heterogeneous communities, problem structuring becomes far more difficult and hence participatory processes may not always lead to successful outcomes in the short-term nor to social and/or relational inclusiveness.

From the findings of this research, some policy recommendations are provided for each case study and for Australia and Costa Rica. A recommendation for the Angas Bremer case study and for the whole of South Australia is for the state government to keep funding and supporting the ABWMC due to its valuable contribution to the achievement of participation in groundwater governance. Keeping the funding is essential to reduce costs to volunteers and ensure an adequate organization and implementation process of participation. In this context, what is needed is to explore how to create institutional mechanisms and ways of redirecting funding to support and sustain community organizations such as the ABWMC that are participating in groundwater governance. For the South West case study, and in fact for the whole of Western Australia, the recommendation is to foster (e.g. providing more funding) the existing advisory groups as well as create new ones where groundwater users are not sufficiently organized. In addition, it is important that government officials give more weight to non-government stakeholder's inputs to WAPs. In order to achieve this, it is pertinent to start implementing statutory planning in Western Australia. As long as water and groundwater allocation plans continue to lack statutory powers, this incentive will not exist.

A recommendation for Guácimo is to have local government agencies such as the municipality involving the community when decisions about new pineapple plantations are being taken. The community's experiences with groundwater problems (e.g. lawsuits) need to be taken into account when permits for the pineapple plantations are being discussed. For the coastal communities of Santa Cruz, it is fundamental that government agencies (e.g. AyA) invest in funding the novel entities of the ASADAS. A further recommendation for Costa Rica is to finally adopt and implement a new water law that prioritizes environmental concerns such as groundwater pollution above economic growth (pineapple plantations and tourism). Moreover, Costa Rica needs to establish and implement local (ground)water management plans (similar to the WAPs in Australia) where stakeholders and users have a say as to how to use, distribute and govern groundwater resources. Such plans need to recognize the link between surface and groundwater resources as well as the connections with other natural resources (e.g. soil and forest).

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