CHAPTER 2

Using Attributes of Good Governance to Advance the Common Interest for Rural Drinking Water Management in Costa Rica

Abstract

Sustainability of drinking water resources is a growing global concern and most threats to these resources are more about governance than the resources themselves. Despite many improvements in recent decades, the quality and quantity of drinking water resources in rural Costa Rican communities face significant uncertainties and growing challenges. In addition, failure of current governance processes and resulting management practices to achieve goals of stakeholders in both rural communities and government agencies poses risks to drinking water resources. In this paper, I use problem orientation of the policy sciences to understand rural drinking water problems in Costa Rica. I then use the normative attributes of good governance from various bodies of literature as a lens to analyze multiple stakeholders’ perspectives and identify alternatives to achieve desired outcomes for rural drinking water governance with a focus on serving the common interest. This case study provides a policy analysis for practical application in a specific context, and presents a generalizable method for analyzing problems in any governance context. This method relies on integrating a problem-oriented approach to policy analysis with multiple perspectives about attributes of good governance to reveal potential opportunities to improve governance in the common interest and achieve policy goals.
Introduction

Approximately 80% of the global population faces serious threats to water security (Vörösmarty et al. 2010), indicating widespread risks to the availability and acceptability of both the quantity and quality of water required to sustain public health, livelihoods, and ecosystems (Grey and Sadoff 2007). Global drinking water coverage reached 89% in 2012, meeting Millennium Development Goals (United Nations 2013); however, it is well documented that the poorest and least powerful members of society are the ones who lack access to clean drinking water (WHO/UNICEF 2014). Deterioration of water quality is a serious problem in most countries of the world, and the magnitudes and extent of water quality problems are largely unknown (Biswas et al. 2006). While consistent access to potable drinking water is essential for public health and sustainable social and economic development, few countries globally have reliable data about the quality and quantity of their water resources (World Water Assessment Programme 2009).

The Latin America and Caribbean region has made substantial advances in the last fifteen years, reaching drinking water coverage of 96%, the highest among developing regions (WHO/UNICEF 2014). However, disparities continue to leave low-income and rural populations disproportionately affected by poor quality of water services, with 72% coverage in rural areas of Latin America (Journalev 2004; WHO/UNICEF 2014). These same situations are observed in Central America where poor water quality remains an issue, particularly in rural areas (Ballestero and Reyes 2006). Although Costa Rica has made substantial progress in recent decades by increasing national coverage of drinking water to 98%, the country continues to face disparities in drinking water quality for rural populations.
(Cunha Marques 2010; Madrigal-Ballestero et al 2013), as only 70% of rural drinking water meets national standards for potable water (National Water Laboratory 2010).

The water resource problems the world faces are much more about governance challenges than the resource base itself (Bakker 2008; Cosgrove and Rijsberman 2000; Pahl-Wostl and Ross 2010; Rogers and Hall 2003). Water governance is defined as “the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society” (Rogers and Hall 2003:7). Water governance processes occur through the larger social system, and involve multiple actors and levels of authority in different sectors (Parkes et al 2010). Water governance is particularly complex due to the multiplicity of management actors and jurisdictions, fragmentation among institutions, physical nature of water connecting various elements across a landscape, and multiple scales of influence on the hydrologic cycle (Knuppe and Pahl-Wostl 2011).

Challenges related to the governance of water resources occur throughout Latin America. Regional experts have emphasized the need to address the lack of political attention and priority given to water quality management in this region and recommend strengthening and restructuring institutions, promoting the watershed as the appropriate scale of management, and increasing financial investments in the water sector (Biswas et. al. 2006). One response to the urban-rural disparities and lack of quality service provision in rural areas throughout the region has been decentralization of drinking water resource management and service provision (Akhmouch 2012). The Economic Commission for Latin America and the
Caribbean (ECLAC) has recognized deficiencies of decentralization policies, especially where it occurs without critical analysis of capacities and resources available at the local level (Solanes and Jouravlev 2006).

Costa Rica has an established policy for decentralized rural drinking water management. This policy names the National Institute for Water and Sanitation (ICAA in Spanish) as the governing body of community-based drinking water organizations (CBDWO) who are responsible for administration of service provision (Costa Rica Government 2005a). The existing 1500 CBDWO provide water to rural communities amounting to approximately one-third of the national population (National Water Laboratory 2010). In addition to ICAA and CBDWO, the Ministry of Health (MINSA) and Ministry of Environment and Energy (MINAE) also have formal roles in the supervision and regulation of drinking water quality and quantity (Ballestero and Reyes 2006). However, overlapping institutional roles and responsibilities have led to low levels of enforcement and accountability of agencies involved in the regulation of the water sector and protection of water resources (Ballestero and Reyes 2006). Costa Rica faces challenges with this decentralized drinking water governance system, particularly due to lack of technical and financial capacities in the sector, and processes for collaboration among institutions involved in drinking water service provision (Akhmouch 2012).

Findings from exploratory research leading up to this study indicated uncertainty about the quality, quantity and sustainability of rural drinking water resources in Costa Rica, and revealed that CBDWO and government agency representatives often hold different
perspectives about existing policies and governance processes. However, there are no known studies involving multiple stakeholder perspectives or addressing discrepancies between national policy prescriptions and outcomes in rural communities. Therefore, the objectives of this study are to assess multiple stakeholder perspectives (from local, regional and national levels) about existing and desired rural water governance processes, and to foster dialogue about current challenges and opportunities for improvement. Three main research questions further guided this study:

1) How well are current rural water governance structures and processes meeting goals of national agencies and CBDWO?

2) What factors do multiple stakeholders identify as influencing whether and how well these goals are achieved?

3) What alternatives exist to strengthen attributes of good governance and achieve goals for rural water governance?

The aims of this paper are: (1) to present a policy analysis of rural drinking water governance for practical application in Costa Rica incorporating multiple stakeholder perspectives, and (2) to provide an example of using normative attributes of good governance as a lens to analyze governance problems in any context and reveal potential solutions to improve policy with a focus on serving the common interest. In this chapter, I use problem orientation from the policy sciences to guide analysis of the context of rural drinking water governance in Costa Rica. First, I examine multiple perspectives in this system to explain factors that are inhibiting the achievement of goals shared by multiple stakeholders. Then I use normative
attributes of good governance as a lens to identify alternatives to achieve desired outcomes for rural drinking water governance with a focus on serving the common interest.

Policy sciences and problem orientation

Although there has been a strong focus on the development of predictive models of policy analysis (Smith and Larimer 2009; Weible et al. 2011; Weible, Sabatier and McQueen 2009; Weimer and Vining 2011), many prominent scholars criticize these approaches for their lack of incorporating normative inquiry into policy evaluation (Fischer 2006; Hajer 2003). Policy analysis can be used as an applied social science, where knowledge, rather than being the goal itself, is pursued to help resolve problems faced by society (Hajer 2003) and shape the future to advance the common interest (Brunner et al. 2005). The policy sciences framework is one conceptual approach to study public policy by expanding and deepening understanding of complex policy processes, and assisting in working toward resolving societal problems in the common interest and with human dignity as the single moral goal (Clark 2002; Mattson and Clark 2011).

One key dimension of the policy sciences framework is problem orientation. The purpose of problem orientation is to analyze and understand a policy problem by clarifying and describing participants’ goals, analyzing contextual conditions, projecting developments of current trends, and identifying and evaluating potential alternatives. Problem orientation helps clarify multiple stakeholders’ goals, understand why they are or are not being achieved, and critically analyze possible solutions based on clear problem definition (Clark 2002). Another key element of the policy sciences is a focus on the common interest, or interests
shared widely among members of a community (Clark 2002) that “would benefit the community as a whole and be supported by most community members, if they can find it” (Brunner 2002:8). Without attempting to predict policy outcomes, this framework can be used to carry out a comprehensive analysis to inform decision-making and planning to advance the common interest.

There are several examples of using problem orientation of the policy sciences framework to analyze complex natural resource governance problems. Rutherford et al. (2009) used this framework to guide multi-stakeholder workshops for grizzly bear management in Canada and Richie et al. (2012) used problem orientation to offer follow up recommendations for stakeholders to advance the common interest. Problem orientation has been particularly useful in identifying opportunities to advance the common interest in contexts involving natural resource governance and indigenous groups such as the Shuar of the Ecuadorian Amazon and Yorta Yorta in Australia (Lynch et al 2013; Hammer 2013). This framework has also been used to describe emerging patterns of adaptive governance for natural resources management in the United States (Brunner 2010) and as a basis for analysis of community-based timber management in Mexico (Wilshusen 2009).

**Attributes of good governance**

The role of society in governance is emphasized in the definition as “a process whereby societies or organizations make their important decisions, determine whom they involve in the process and how they render account” (Graham et al. 2003:1). A transition from conceptualizing government to governance has occurred as a response to the limitations of
government alone to solve the pressing, complex problems societies face. This shift reflects a broadening and deepening of non-state activity in policy-making and implementation processes (Fish et al. 2010) and an understanding that multiple actors are central to decision making (Armitage and Plummer 2010). Water governance specifically has also witnessed this shift, which is particularly clear in decentralized systems. While water governance extends beyond the formal processes of government to civil society, the government remains a key player as the term implies a relationship between a society and its government (Parkes et al. 2010; Reed and Bruyneel 2010; Rogers and Hall 2003).

Although defining what constitutes good governance can be a difficult task, there appears to be some degree of universality among principles (Graham et al. 2003). Principles of good governance are based on normative assumptions about what types of processes are better suited for decision-making and planning, and emerge from both theoretical and empirical work. Natural resource literature is full of normative statements about what principles or attributes will lead to better governance processes and better procedural and resource outcomes. While this literature is much too vast for an exhaustive review, I compiled attributes that are generally advocated for in a review of academic and practitioner-oriented literature about governance of natural resources, and specifically water resources¹. Figure 1.1 broadly summarizes five categories of attributes of good governance.

¹ Andersson, Gibson and Lehoucq 2004; Andersson and Ostrom 2008; Armitage et al. 2007; Armitage 2008; Armitage and Plummer 2010; Ascher and Steelman 2010; Brunner et al. 2005; Brunner and Lynch 2010; Bunn et al. 2010; Clark 2002; Cunha Marques 2010; Dietz 2003; Dietz et al. 2003; Folke et al. 2005; Klijn and Edelenbos 2012; Knuppe and Pahl-Wostl 2011; Kootz et al. 2004; Lebel et al. 2006; Pangare et al. 2006; Parkes et al. 2010; Plummer and Armitage 2010; Reed and Bruyneel 2010; Scheberle 1997; Scholz and Stiftel 2005; Solanes and Jouravlev 2006; Steelman and Ascher 1997; Stern 2005; Susskind 2005; UNDP 1997; Walker et al. 2002
These five categories of attributes of *good* governance represent the main themes that emerged through literature review, and they reflect my own systematic grouping of attributes. These categories are not mutually exclusive, but rather they are interconnected and influence each other. For example, while accountability is highlighted as an important attribute for outcomes, accountability is also important for decision-making processes, which shape outcomes. In addition, while trust is an important element for positive interactions, trust can be gained through many of the other attributes, and once gained can influence the development of other attributes.
Participation has to do with who is involved in governance processes and polycentricity, or the existence of multiple levels of authority in a governance system. Literature highlights that good governance processes involve multiple stakeholders and are inclusive, representative and open to any individual or group interested in participating (Cunha Marques 2010; Lebel et al. 2006; Steelman and Asher 1997; UNDP 1997). It is important that all participants (individuals or groups) have freedom of speech and a voice in decision-making so that different interests, perceptions and interpretations are considered in decision-making processes (Parkes et al. 2010; Scholz and Stiftel 2005). Polycentricity means that institutional arrangements exist at multiple levels and multiple scales. Governance literature often promotes decentralization of decision-making where citizens are authorized to self-organize and self-govern, local institutions have rule making authority and policy integration proceeds from the bottom-up (Andersson, Gibson and Lehoucq 2004; Andersson and Ostrom 2008; Armitage et al. 2007; Armitage 2008; Armitage and Plummer 2010; Brunner et al. 2005; Brunner and Lynch 2010; Koontz et al. 2004; Lebel et al. 2006; Parkes et al. 2010; Reed and Bruyneel 2010; Steelman and Ascher 1997).

Interactions refer to the way in which participants interact with each other in governance processes, and include collaboration, communication, deliberation, trust and respect. Collaboration means that participants are networked, allowing for interactions among participants at different levels (e.g., national or local). Collaborative governance processes emphasize positive relationships and are interactive and integrative of people, perspectives and goals (Andersson and Ostrom 2008; Armitage 2008; Armitage and Plummer 2010; Brunner et al. 2005; Brunner and Lynch 2010; Koontz et al. 2004; Solanes and Jouravlev
Governance literature promotes effective communication for exchange of information and ideas, and deliberative processes that facilitate open discussion, consideration of information in policy processes, and the potential for compromise (Armitage 2008; Bunn et al. 2010; Lebel et al. 2006; Solanes and Jouravlev 2006; Steelman and Ascher 1997; Stern 2005). Trust and respect foster social capital among participants in these interactions, and citizen trust and respect for politicians or authority figures is particularly important (Armitage 2008; Brunner et al. 2005; Folke et al. 2005; Scheberle 1997; Scholz and Stiftel 2005).

Decision-making as a category refers to how decisions are made throughout governance processes. Decision-making processes are considered to be good processes when the work that institutions carry out to arrive at decisions is transparent, or publicly accessible, clear and coherent (Cunha Marques 2010; Pangare et al. 2006; Scholz and Stiftel 2005; Solanes and Jouravlev 2006; UNDP 1997). Good processes also incorporate multiple types (facts and values) and sources (e.g. scientists, managers, policy makers, resource users, citizens) of knowledge in decision and policy-making (Ascher and Steelman 2010; Scholz and Stiftel 2005). Particular emphasis is placed on information being trustworthy and competent, transparent and clearly accessible to the public, and congruent with decision-makers’ needs in terms of timing, content and format (Armitage 2008; Brunner et al. 2005; Dietz 2003; Dietz et al. 2003; Folke et al. 2005, Knuppe and Pahl-Wostl 2011, Pangare et al. 2006, Solanes and Jouravlev 2006; Steelman and Ascher 1997; UNDP 1997). Good decision-making processes focus on consensus among participants by making the primary goal identifying and advancing the common interest (Brunner et al. 2005; Dietz 2003; UNDP...
Good processes also use mechanisms to deal with power differences and to prevent and manage conflicts, such as mediation, arbitration, negotiation and deliberation (Cunha Marques 2010; Dietz et al. 2003; Steelman and Ascher 1997). It is important that all of these tools, processes and decisions are specific to the relevant context (Armitage 2008; Brunner et al. 2005; Brunner and Lynch 2010; UNDP 1997). All attributes of good decision-making processes should aim to produce decisions that are effective for meeting multiple needs and in a timely manner (Steelman and Ascher 1997; UNDP 1997).

Governance literature advocates for outcomes, or results of decision-making processes, that promote accountability, responsiveness, effectiveness, efficiency, equality, equity, universality, the rule of law, compliance, and sustainability. Good governance includes mechanisms for participants to hold each other accountable for institutional functioning, decision-making and following through to outcomes. Particular emphasis is placed on processes for the public to hold decision-makers and institutions accountable for their decisions and actions, and incentive structures to hold local politicians accountable in decentralized contexts (Andersson and Ostrom 2008; Armitage 2008; Clark 2002; Lebel et al. 2006; Pangare et al. 2006; Scholz and Stiftel 2005; Solanes and Jouravlev 2006; UNDP 1997). Outcomes are most effective when decisions and decision-making processes are viewed as legitimate, given that legitimacy reflects participants’ willingness to accept and comply with decisions (Klijn and Edelenbos 2012). Effective policies have clear objectives for efficient use of resources to meet needs (Clark 2002; Dietz 2003; Pangare et al. 2006; Scholz and Stiftel 2005; Solanes and Jouravlev 2006; Steelman and Ascher 1997; UNDP 1997), and are non-discriminatory by granting equal access to benefits (Armitage 2008;
Cunha Marques 2010; Dietz 2003; Pangare et al. 2006; Scholz and Stiftel 2005; UNDP 1997). Good governance results in ethical legal frameworks that are impartially enforced (Lebel et al. 2006; Solanes and Jouravlev 2006; UNDP 1997), as legitimacy of enforcement processes and enforcers leads to greater compliance (Clark 2002; Dietz et al. 2003). Sustainability of outcomes refers to decisions, benefits, and resource use that are viable for the foreseeable future, and balances human and environmental well-being (Cunha Marques 2010; Dietz 2003; Scholz and Stiftel 2005; Solanes and Jouravlev 2006).

Adaptiveness in governance refers to institutional capacity to respond to changes by embracing flexibility, learning and responsiveness in iterative decision-making, implementation and evaluation processes (Brunner et al. 2005; Plummer and Armitage 2010; Scholz and Stiftel 2005; Susskind 2005; Walker et al. 2002). Adaptiveness includes leadership, learning, monitoring and evaluation, embracing uncertainty and surprise, being prepared for change and developing a strategic vision. Adaptive capacity is built through good governance processes that develop leadership among participants extending well beyond authoritative decision-making (Armitage 2008; Brunner et al. 2005; Folke et al. 2005; Solanes and Jouravlev 2006). Adaptive capacity is enhanced when social and individual learning occurs through collaboration and sharing knowledge about science, facts, values, and a diversity of interests and perspectives (Armitage 2008; Armitage and Plummer 2010; Dietz 2003; Folke et al. 2005; Scholz and Stiftel 2005; Walker et al. 2002). Monitoring and evaluation of policy implementation and outcomes that continuously influence management actions are also key for adaptiveness (Armitage and Plummer 2010; Brunner et al. 2005; Bunn et al. 2010; Cunha Marques 2010; Pangare et al. 2006; Scholz and Stiftel
Flexible institutions designed for ongoing knowledge acquisition allow them to embrace uncertainty and develop adaptive capacity (Armitage and Plummer 2010; Brunner et al 2005; Bunn et al. 2010; Dietz et al. 2003; Steelman and Ascher 1997). Developing a strategic vision is a means to incorporate aspects of adaptiveness by forming a broad and long-term perspective on *good* governance, and building understanding of the historical, cultural and social complexities in which that perspective is grounded (UNDP 1997).

The attributes of *good* governance shape the way goals are met in society. The participants in a governance process and how they interact with each other to make decisions determines what outcomes will be seen over short- and long-terms. These attributes are discussed and promoted throughout environmental governance literature as a normative description of what governance processes should ideally achieve. However, perfect governance does not exist (Andersson and Ostrom 2008). Although too much focus on normative principles could appear as promotion of a recipe for *good* governance (Armitage 2008), they are not meant to be a panacea. Attributes of *good* governance are a useful lens to address governance challenges in specific cases and to design systems for governance carefully for and within a specific context (Graham et al. 2003).

**Methods**

**Study region**

Costa Rica is a Central American country with a total 2011 population of 4,301,712 inhabitants (National Institute of Statistics and Census 2011), of which 64% live in urban areas and 36% in rural areas (United Nations 2010). The country is territorially divided into 7
provinces, 81 cantons and 470 districts; within each district are multiple communities (Bixby 2002; Costa Rica Government 2009). This study was carried out in the Turrialba, Jiménez and Orosi Cantons of the Cartago Province, referred to here as the Turrialba region. The study region lies within the Reventazón watershed, which contributes 11% of the nation’s agricultural exports and 38% of national hydroelectric energy production (Catano et al. 2009). While the Reventazón supplies 25% of the drinking water to the metropolitan region of San Jose, it is also the second most contaminated watershed in the country, as it receives large amounts of untreated wastewater from San Jose (Marchena 2009).

The current study was designed based on exploratory research carried out between May-July 2011 about rural drinking water governance in the study region. This research included twenty-five semi-structured interviews (with CBDWO representatives, government agency representatives, regional conservation groups, and scientists), eleven field site visits to springs and drinking water systems in rural communities, and document review. Findings from this exploratory research phase highlighted: (1) disparities among CBDWO effectiveness in providing services, (2) uncertainty about the quality, quantity and sustainability of rural drinking water resources in this region, and (3) different perspectives about current policies and governance processes among stakeholders from CBDWO and government agencies.

**Study design: participants, sampling and data collection**

Study participants were CBDWO representatives at the local level and government agency representatives at regional and national levels. Purposive snowball sampling (Creswell 2003;
Lofland et al. 2006) was used to identify relevant stakeholders at local, regional and national levels. CBDWO representatives were identified through a database of existing CBDWO in the study region, including both formal associations (Asociaciones de Acueductos y Alcantarillados Rurales, or ASADAS in Spanish) and informal committees (Comités de Acueductos Rurales, or CAAR in Spanish). Regional government agency representatives were contacted directly and asked to provide the names of agency representatives at regional and national levels working in areas relevant for rural drinking water governance. Data were collected between February 2012 and May 2013 using semi-structured interviews.

A total of 37 interviews were conducted- 18 interviews with 13 different CBDWO in the study region, 13 interviews with government agency representatives (7 at the national level and 6 at the regional level), and 6 interviews with non-government professionals. Local level CBDWO interview participants included current and past board members and administrators. Representatives of government agencies involved in development and implementation of policy related to rural drinking water, both nationally and in the study region, were interviewed, including the following agencies: National Institute of Water and Sanitation (ICAA), Ministry of Environment and Energy (MINAE), Ministry of Health (MINSA), and the National Service for Ground Water, Irrigation and Drainage (SENARA), and the Commission for the Protection of the Reventazón Watershed (COMCURE). Professionals included representatives from non-government organizations, foundations, private businesses and academic institutions whose work is related to rural drinking water governance. All interviews were conducted in person, for 1-2 hours, and in Spanish.
Semi-structured interviews included primarily open-ended questions, and were conducted as directed conversations with research participants (Lofland et al. 2006). This type of intensive interviewing allows for an in-depth exploration of the participants’ interpretations of their own experiences (Charmaz 2006). The main purpose of these interviews was to assess multiple stakeholder perspectives about: (1) trends and conditions related to drinking water resources and service provision, and (2) current and desired rural water governance processes. The interview guide (see Appendix A) was written with focus questions and potential probing questions for a larger study on drinking water, wastewater and river health. Although these interviews comprise the data used for analysis in this manuscript, data collected through an additional 24 interviews, 5 facilitated workshops, and eight months of fieldwork carried out over 3 years on the topics of rural development and water governance contributed significantly to my contextual understanding for this study and policy analysis.

All participants provided verbal consent to participate in this research and permission for audio recording of interviews. This research was approved by the Institutional Review Board of the University of Idaho’s Office of Research Assurances (Appendix B).

**Data analysis**

I utilized a grounded theory method, a systematic yet flexible approach to data analysis (Charmaz 2006). Audio recordings of interviews were transcribed and then coded using the ATLAS.ti 7 software program. Coding was carried out using a general notice-collect-think model (Friese 2012) in an inductive process. Initial coding was used to identify and define categories by assigning descriptive codes based on sensitizing concepts (i.e., initial ideas for
conceptual framework development), then more focused coding was used to explain categories by assigning analytic and conceptual codes for theoretical integration of categories (Charmaz 2006; Patton 2002). Findings from the exploratory research phase, elements of the policy sciences framework, and normative attributes of good governance in Figure 1.1 were used as sensitizing concepts. I used emergent themes to construct theory, or my description, explanation and interpretation of this particular context (Charmaz 2006), resulting in this policy analysis grounded in the data and my interpretations of it. To honor the complexity of qualitative data analysis, I would like to highlight that “no abstract processes of analysis, no matter how eloquently named and described, can substitute for the skill, knowledge, experience, creativity, diligence and work of the qualitative analyst” (Patton 2002). Coding and analysis processes were carried out in the Spanish language, and only direct quotations were translated for use in this manuscript.

**Findings and interpretations**

In the following sections, I present findings and interpretations using the steps of problem orientation from the policy sciences- goals, trends and conditions, projections, and alternatives.

**Goals**

The first step in problem orientation is to identify the goals or preferred outcomes of stakeholders relevant to the problem context at hand. CBDWO and government agencies, the main stakeholder groups involved in the rural water sector, expressed the same principal goals for governance of drinking water resources (Table 2.1). The primary goal identified by
both CBDWO and agency representatives was that all rural citizens have consistent access to drinking water of sufficient quantity and quality. Both CBDWO and agency representatives emphasized the need for expanding adoption of conservation practices to ensure the sustainability of water resources in the present and future. While CBDWO were more focused on water quantity and availability, government agency representatives focused more on the importance of drinking water quality. Both CBDWO and agency representatives expressed preference for the current governance model for community-based drinking water management over alternative municipal or government control models and expressed a desire for strengthening CBDWO capacities. Representatives from both stakeholder groups also expressed the desire to see actors in the water sector working together to achieve their common goals.
Table 2.1. Summary of main goals for rural drinking water governance shared by CBDWO and government agency representatives.

<table>
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<tr>
<th>Shared goals</th>
<th>Supporting quotations from interviews</th>
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| **Potable drinking water:** consistent access, of adequate quantity and quality | The goal is to have a CBDWO at 100%, 100% water quality and quantity. That’s our goal, to provide service of full quality and quantity. (CBDWO)  
It’s sad to have a family without water, awful, it’s terrible. So we don’t want that for anyone, not for ourselves or for anyone who comes to live here. (CBDWO)  
I want to help the community so they always have access to potable water. (CBDWO)  
Our goal is for Costa Rica to be a place where we have sufficient water in quantity and quality. (Government Agency)  
Potable quality, which is only achieved with treatment. We should be a country with 100% potable water. (Government Agency) |
| **Increased conservation practices:** protect water quantity and quality for rural populations | We don’t know how long our water will last, but we always have to think about the future…I’m worried about the water that is wasted because we have to think about the future. Water cannot be substituted for anything else. If the lights get cut off you can substitute a fire, but water cannot be substituted for anything else. So we have to take care of it. (CBDWO)  
Water is one of the greatest things we have and if we don’t take care of it we will surely end up having huge problems. (CBDWO)  
We shouldn’t waste water, one day they have to understand. (CBDWO)  
I hope people will one day have awareness that water has to be treated in some way. (Government Agency)  
The fear about water is a national priority, because remember that water is an essential element for life and people’s health. If we don’t have good conditions water becomes contaminated, and if people have contaminated water health problems arise. (Government Agency) |
| **Community-based management of drinking water** | I think this is a good form for management because, for instance, if we as a committee are failing at something, the community has all the right to bring it to our attention. (CBDWO)  
The Turrialba Municipality doesn’t have the capacity that we have in the community to manage water. I could say the same about ICAA… we are the ones who make sure the community has sufficient water. (CBDWO)  
The municipality cannot provide water to the whole region, so in a lot of places people prefer to form their committee and provide water in their community through a CBDWO. And there is a lot of interest in maintaining management this way through CBDWO. (Government Agency) |
| **Work toward common goals** | Our goal is to provide a service in quality and quantity. I think this is everyone’s goal, what the government wants, and that we all support this same goal for water resources, that we all put our efforts toward the same goal, work toward the same thing. (CBDWO)  
We have to teach people that everyone has feelings, and we all have the same needs, we have to teach this culture…we don’t need to see differences…we have to teach people that everyone here is fighting for the common well-being of everyone. (CBDWO)  
If only we could channel all of these efforts, not only of this institution, but everyone in the water sector, toward the same direction. (Government Agency) |
Each of these stakeholder groups also expressed specific goals related to their institutional roles and responsibilities. CBDWO board members emphasized their motivations in contributing to the well-being of their communities and all members.

We always have to consider the community. (CBDWO)

I’m not benefitting myself from doing this. What I do is for the benefit of the entire community. (CBDWO)

While government agencies are also concerned for the well-being of citizens, their key goal is to ensure that CBDWO follow established laws and regulations regarding drinking water administration.

What the board of directors mainly has to do is follow the rules and laws, follow the ICAA regulations. (CBDWO)

What we want is for the associations [CBDWO] to understand the responsibilities that they have. (Government Agency)

Although these stakeholder groups have specific institutional goals, their expressed desire to work together to serve the common interest will be a valuable asset when identifying and implementing alternatives to achieve these common goals.

**Trends and conditions**

Once goals are clarified, the next step in problem orientation is to explore movement toward and away from the stated goals (i.e., trends) and factors that have been influencing this movement over time (i.e., conditions). Here I describe the dominant trends and conditions related to drinking water quality and quantity, protection zones, community-based management, and relationships between CBDWO and government agencies.
Drinking water quality

Many improvements in Costa Rica’s drinking water sector have been observed in recent years. These include reaching national rates of 98% service coverage, 77% disinfection (i.e., chlorination), and 90% potability of drinking water (National Water Laboratory 2007; 2010). Government agencies recognize these positive advances in development and public health benefits. They also recognize the need to continue improving drinking water quality, particularly in the rural sector.

Although the rate of potability specifically in rural communities has increased, 28% of rural populations remain without potable water (National Water Laboratory 2007). CBDWO use chlorination as the mechanism to treat drinking water for contamination with bacteria and other potentially harmful pathogens. While ICAA has promoted the treatment of drinking water and donated chlorination systems to some CBDWO, many communities in the study region continue to rely on untreated drinking water. Moreover, national data on the rates of “potable” water among CBDWO are limited to the presence or absence of bacterial coliforms, and levels of heavily used agrochemicals are not monitored. While CBDWO express a lack of awareness about the existence of agrochemical testing, government agencies recognize the need to have a more holistic perspective of water quality that includes other potential contaminants of concern.

In reality we haven’t tested the water for agrochemicals. ICAA doesn’t do this type of analysis and I don’t know if they would do it if I asked, or if it is within the parameters of what they do test the water for, or if they can detect that kind of contamination. (CBDWO)
We don’t do analysis for agrochemicals. It is a very, very expensive and unusual test. I have never seen anyone in this region ask for this kind of test. (Government Agency)

It’s scary that we are realizing that water quality is not just about fecal coliforms. Right now we have some CBDWO that are drinking arsenic in their water, above the limits allowed according to the Potable Water Regulation, so there we have a lot of work to do. It’s not simply a matter of eliminating coliforms, but also knowing the physical-chemical quality of the water that could eventually affect people’s health. (Government Agency)

Low rates of drinking water treatment present public health concerns, and rural communities are vulnerable to drinking water contamination based on the infrequency of water quality monitoring. Water quality testing is required by law, and mandated testing frequency is dependent on population size of each community, ranging from twice a year for less than 2,000 people to once a month for greater than 100,000 people (Costa Rica Government 2005b). However, compliance and enforcement are limited, as most CBDWO in the study region report having their water tested once every six months to two years at best, principally due to limited financial resources to pay for tests. Moreover, given that water resources can be affected on the order of hours or days after a contamination event (American Water Works Association 2003), the frequency of water quality monitoring in this region is insufficient to detect and respond to potential public health concerns in a timely manner. In addition, as one government agency representative pointed out, current testing is unable to detect, let alone prevent, the long-term effects of potentially harmful water contaminants.

If there is a contamination with fecal coliforms, it will likely give you diarrhea, all of a sudden, from one day to the next. But in the case of agrochemicals, like arsenic among other things, by the time you know it is giving you problems, there’s nothing you can do about it. (Government Agency)
In spite of the infrequency of water quality monitoring and the absence of testing for widely used yet potentially harmful contaminants, many CBDWO report a high level of satisfaction with the quality of their drinking water. However, due to limitations in data about water quality, it is likely that reports of adequate water quality reflect a false sense of security among CBDWO about rural drinking water quality.

They have never monitored water because it has always appeared to be clean. There are standards for water quality, but nobody enforces compliance. It is very likely that what we call potable water is not potable. (Non-government)

Government agency representatives also express perspectives that are likely overly optimistic about rural drinking water quality, in viewing the frequency of water quality analysis as adequate and dismissing the general need for drinking water treatment.

In Turrialba and Jimenez I have never heard about health problems from water. Years ago there used to be a lot of illness because they didn’t test water, but now people care about the quality of their water. People generally care about quality and that is why they do so many tests, and that is why they have improved the spring capture tanks and storage tanks, it’s all for the quality of their water and the well-being of the population they serve…Tests didn’t used to exist and that’s why there used to be so much contamination. (Government Agency)

Most CBDWO have potable water without the need for treatment, however, the rules of the OPS and OMS [Pan-American Health Organization and World Health Organization] require water purification, even if it is potable like our water, so we follow the international norms that aim to prevent or even further guarantee water quality. (Government Agency)

CBDWO and government agency representatives also expressed concern about land use practices, particularly agrochemical use and cattle grazing, which could negatively impact rural drinking water resources. These existing risks to drinking water sources on the landscape coupled with the lack of monitoring of drinking water quality leaves rural
communities highly vulnerable to compound risks to their health and well-being. As one agency representative points out:

> It doesn’t matter if the country has a lot of water if it’s contaminated, right. (Government Agency)

**Drinking water quantity**

Both government agencies and CBDWO in this region reported overall sufficient water quantity, but many CBDWO reported declining water availability during the dry season when decreased precipitation results in decreased spring flow (i.e., amount of water per unit of time available in the spring). Many CBDWO also reported declining water availability due to deforestation around springs. Although decreased spring flow after removal of trees from land immediately around a spring is reported as common knowledge in Costa Rica, there is limited empirical evidence for this process (Bruijnzeel 2004). Some CBDWO are also worried about their capacities to meet water demands of growing populations in the future and dry seasons becoming more extreme. One CBDWO representative expressed frustration that citizens have not cared enough to help prevent or fix the problem before it became so extreme.

> Personally I am very worried, very worried, because I live here and if one day we no longer have water, we would have to leave and we wouldn’t have another option. And the dry season every year is stronger… we’re already seeing a difficult situation since we don’t have water here. We have problems now, and people have already seen that the problem is serious. I’ve been telling them that it’s not a situation to play with, that we need to take it seriously or else we are going to remain without water. Because how is it possible that we don’t have water here and we have to leave, and people haven’t been interested in getting involved, they’ve stayed on the sidelines for a long time. And now that they see the problem, that our water supplies have decreased so much, now they are going around trying to see how we can recover what is almost lost. (CBDWO)
The level of concern about water quantity that CBDWO expressed is influenced by a lack of knowledge about current water supplies and uncertainty about future water supplies. Very few CBDWO in the region monitor water quantity or spring flow. Government agency representatives recognized the need for monitoring flow, but support for rural CBDWO to learn how to record and analyze flow data is limited to trainings offered by ICAA. The effectiveness of these trainings appears to be limited, as few CBDWO implement monitoring practices. Limited effectiveness of trainings could be due in part because they are offered annually at most, and carried out by presenting slides to large groups, without hands on demonstrations, and allotting very little time for questions and group discussion. One agency representative highlighted the need to monitor flow in the region, and the need to protect springs and other areas contributing to spring flow.

We need to start monitoring flow… but first we need to protect the springs and the recharge zones. (Government Agency)

The location of recharge zones (i.e., areas of land that directly contribute to replenishing spring flow) is largely unknown. Costly hydrogeological studies would be needed to gain this knowledge. Both government agencies and CBDWO reiterated the need for knowledge of recharge zones contributing to springs. One study (Vásquez del Castillo 2008) has provided a few CBDWO in the study region preliminary information about where their recharge zones are located, although they lack funds to purchase this land as well as authority to enforce protection measures on others’ land. Lack of knowledge about quantity of drinking water sources currently and for the future, coupled with limited protection measures, contribute to uncertainty about drinking water resources that sustain rural communities.
Protection zones

Protection zones have been established to increase both quality and quantity of drinking water. Two existing laws - the Water law (Costa Rica Government 1942) and Environmental law (Costa Rica Government 1995) - establish protection areas around springs with 200- and 100-meter radii, respectively. These laws prohibit agricultural activities and require forestation within these areas. Since both laws are valid, CBDWO are often confused about which area they should aim to respect. Moreover, these areas were established arbitrarily by policy makers and not based on scientific evidence (González Cueva 2011). In addition, these protection zones for springs are based on an assumption that forestation results in increased spring flow. Although widely believed to be true among citizens, CBDWO and government agencies in Costa Rica, there is limited scientific evidence to support this assumption about biophysical processes contributing to water resources (Bruijnzeel 2004). Both CBDWO and agency representatives express the importance of protecting the land directly around springs to ensure both water quantity and quality.

We need a forested area that protects the springs with two objectives. One, to protect the spring so we have enough water. And the other essential objective is to prevent contamination. Because they are areas with cattle grazing so the second objective is protect the springs from microbes from the cattle getting into the water. That is the objective of having the areas covered. (CBDWO)

For me the idea is to see the system completely restored, with the protection zones totally registered in the name of the CBDWO so this zone doesn’t impose any risks. (CBDWO)

They [CBDWO] have to acquire the land where their groundwater is, right…that these zones are protected and without human activity, whether industrial, agricultural or grazing, it should be eliminated. They should purchase and protect these areas to assure that there will be water in the future, for everyone. These are goals that are being achieved little by little and the communities and CBDWO are concerned about acquiring these lands. (Government Agency)
The 1942 water law also establishes that landowners do not own the water with their land, but that water is owned by the state and all citizens have a right to water. CBDWO are encouraged to sign a formal agreement with owners of land where springs are located to register the spring and surrounding land in the CBDWO’s name, or to purchase land around springs when possible, in order to ensure CBDWO access to springs and respect for protection zones. While a few CBDWO have been able to purchase land around their springs to increase their certainty about protection of the spring itself, most rural CBDWO lack financial resources to purchase land.

Although these laws defining spring protection areas exist, there are many challenges to adequate enforcement. For example, the total area of a circle with radius of 100 or 200 meters amounts to approximately 3 - 12.5 hectares. The landscape of the study region is largely a matrix of private land with predominantly small landholders who typically own less than 3 hectares and depend on using this land for farming or raising cattle for their livelihoods. Enforcement of forestation for spring protection would have drastic effects on farmers’ abilities to live off of their land. One CBDWO representative and land owner in the region explained that although necessary, these water protection measures place unrealistic expectations on land owners in the region without providing safety nets (e.g., government compensation or payments for ecosystem services) to support small landholders facing these tradeoffs between spring protection and agricultural income.

I have an area of two hectares and I grow cilantro, lettuce, tomatoes when I can, and peppers too when I can, chayote, cucumber, and I have an area with bananas… I can’t spray chemicals because the spring is right there… and if they tell me that I can’t grow there then they leave me like this, with my arms crossed, because the spring is in the middle of the property… Imagine if they apply this law to me, they take
everything away from me, everything, everything, and how would I maintain my family. (CBDWO)

The main enforcement mechanism for water resource protection is through formal complaints filed by citizens, and often CBDWO board members, who are aware of laws and looking out for the best interest of the community’s drinking water resources. When a formal complaint is filed to report a landowner cutting down trees or spraying agrochemicals within a spring protection zone, the regional MINAE office is responsible for following up with enforcement and sanction processes. However, lack of financial and human resources faced by agencies in the study region and throughout the country limit their enforcement capacity. In addition, one agency representative explained that if a landowner facing penalty for breaking spring protection laws raises the argument that such laws are not based on scientific evidence, then all claims can be dropped. Despite existing protection measures, many CBDWO report problems with landowners in the region cutting down trees and planting crops within the protection zones established by law, resulting in concerns about drinking water quantity and quality for CBDWO.

In this moment we are having problems with a man who recently bought a farm here…he got here and cut down everything, he cut down everything, to plant coffee…there is a small spring there and he cut everything. He said ‘this farm is mine’ and just cut it all. He knew he couldn’t, but he says that he didn’t know that he couldn’t cut down the trees. Everyone knows that wherever there is a spring, you can’t cut trees. (CBDWO)

We are really affected by deforestation here, not everyone thinks about taking care of water, some people aren’t interested. Personally, I have always fought for taking care of water, for taking care of the environment, for trying to get people to not waste water, but it’s really hard, people often aren’t interested. (CBDWO)

Thus, although existing laws determine that drinking water protection is focused on the area right around each spring, enforcement is limited. Moreover, the majority of the area in each
spring area is downslope from the spring and not likely influencing spring water, thereby limiting the expected effectiveness of focusing spring protection on these rings. Government agency and CBDWO representatives recognize that areas upslope from the spring that directly contribute to spring water (i.e., watersheds) and recharge zones, both of which are critical to protecting water quantity and quality, remain largely unprotected.

We have had a hard time having a holistic vision for CBDWO. From the storage tank upslope, they still don’t have it covered. Their focus is from the tank to the homes. A holistic vision has been hard for us to achieve, because CBDWO are dispersed around so many different places. (Government Agency)

We’ve changed. We’re not the same Costa Rica as twenty or thirty years ago when there were fewer people. The population has grown, and a lot of housing projects have been built on groundwater recharge zones… this has caused greater contamination of water resources, whether through filtration or runoff, so it’s clear that now we can’t just drink water anywhere we go. (Government Agency)

The problem is that these springs are very deep, and they are not completely protected. (CBDWO)

A vision toward watershed scale management is made evident in the MINAE National Plan for water resources management (Costa Rica Government 2010) and a new water resource law with this vision was recently passed (Costa Rica Government 2014). However, watershed scale management has yet to be operationalized and implemented in Costa Rica. Many agency representatives emphasized the pressing need for a watershed vision to adequately protect water resources in country. This transition appears to be underway, although it is in its early stages.
Community-based management

Costa Rica has an established policy for decentralized drinking water service provision. National policy places the responsibility of providing rural drinking water services in the hands of rural communities themselves through the formation of CBDWOs (Costa Rica Government 2005a). Approximately 1,500 CBDWO exist throughout the country (Madrigal-Ballester et. al. 2013). These include both formal associations (Asociaciones de Acueductos y Alcantarillados Rurales, or ASADAS in Spanish) established under the CBDWO regulation (Costa Rica Government 1995), as well as informal committees (Comités de Acueductos Rurales, or CAAR in Spanish) established prior to this regulation. The government promotes that these informal committees follow procedures to sign a legal agreement with ICAA to become formal CBDWO (Madrigal-Ballester et al. 2013); however, there is evidence that this legal framework is not sufficient to improve CBDWO performance drinking water quality (Flores Noya 2009).

The successes of community-based management of rural drinking water can be largely attributed to the dedication of community volunteers. CBDWO are established by forming board of directors through a community-wide election. The only paid position in most CBDWO in the region is the plumber (fontanero in Spanish) who oversees the system infrastructure. Some CBDWO who have sufficient funds to hire an administrator to manage service provision and user fee collection. The CBDWO board members who make community-based drinking water management possible exhibited an incredible amount of dedication to their communities.
All my life I have been dedicated to community leadership, all my life I have been positive, and I always say that if we are not positive we will never achieve anything. (CBDWO)

CBDWO representatives explained how strong leadership and relationships among board members is key for improving and maintaining drinking water systems.

Luckily, we have a very good board of directors in this moment, and for the last two or three periods they have been very, very involved in maintenance, improving the tanks, we’re improving little by little. We just finished lining the storage tanks with ceramic and putting fencing around the spring capture tanks. (CBDWO)

Although CBDWO volunteerism and dedication appears strong in many communities, participation in CBDWO decisions and actions among the larger community is often difficult to achieve. Many CBDWO expressed a desire to see more active involvement and dedication among community members.

Most communities have the same serious problem we do, that nobody likes to participate. You invite them to a voting assembly and 50 of 200 show up. People don’t like to collaborate, they don’t like to show up…if we could only drag everyone to a meeting to see what it is that we do and what we need to do to improve things, this is what I always say, the general participation of people is missing. (CBDWO)

Despite low levels of community-wide participation in CBDWO affairs, awareness and concern for water issues has increased among citizens in recent decades. Many interviewees described a sort of cultural shift that has occurred among the general population over recent decades. Although considered a renewable resource historically, it is now widely accepted that water is a nonrenewable resource that must be conserved and protected. CBDWO and government agency representatives both viewed this as an important achievement for
increasing conservation practices and enhancing the sustainability of water resources in the country.

A greater common interest in water has been sparked. (CBDWO)

Years ago we were taught that water was a renewable resource…now it’s a non-renewable resource and we are taught to take care of it. (CBDWO)

In this country, back when I was studying, water was included in the renewable resources of this planet. Not anymore, now it has switched from a renewable to a non-renewable resource… a cultural change has occurred. (Government Agency)

I think it is getting better, people are understanding that the resource is not only finite, but also that it is a resource that needs to be taken care of. (Government Agency)

Despite increased awareness for water issues, many CBDWO still expressed frustration about the lack of concern and action to conserve and protect water resources in their communities.

As human beings we haven’t understood that what we throw into the river we ourselves will drink in a few years. And it’s pathetic when one works for the CBDWO to know that there is so much contamination, and when you try to talk about it with people they don’t understand. Until the water is gone, they won’t value it. (CBDWO)

What one plants, one grows. If you plant tomato seeds, you pick tomatoes. If you plant potatoes, you pick potatoes. If you plant indifference for water, for not caring, we won’t have water. (CBDWO)

Between the 1960s and 1990s the government invested heavily in construction of infrastructure for rural CBDWO (Madrigal-Ballester et al. 2013). However, most CBDWO in the region reported challenges related to development and maintenance of system infrastructure. They also reported difficulties related to understanding laws, and maintaining bookkeeping and administrative documentation consistent with ICAA regulations.
CBDWO need a lot of help, help with information, help with materials, legal help to keep documents up to date. They need new tanks and updated distribution systems too, a lot of pipes are seventy years old. (Government Agency)

The current governance system for rural drinking water was designed making ICAA the state level governing body of CBDWO who are responsible for administration of service provision (Costa Rica Government 2005a). Regional representatives of ICAA are assigned the main role of providing administrative support and supervision, while CBDWO are responsible for infrastructure development and maintenance. A few key laws are meant to contribute to the financial and administrative stability of CBDWO, including CBDWO signing a formal agreement with ICAA (Costa Rica Government 2005a), charging citizens the state-established rate for water services (Costa Rica Government 2005a), and installing meters to monitor household water consumption (Costa Rica Government 2008). However, many CBDWO in the study region have resisted implementing these policies in their communities. The source of this resistance is CBDWO failing to perceive that the benefits of compliance with laws outweigh the risks they take in their communities.

They get scared, scared to follow the laws and regulations, because they want to avoid making enemies with the people in their communities. (Government Agency)

Table 2.2 presents the different perspectives held by CBDWO and agency representatives about the implementation of these laws that have been the source of much contention in this region in recent years.
Table 2.2. Different perspectives about the implementation of existing laws that influence CBDWO management and administration of drinking water resources.

<table>
<thead>
<tr>
<th>Policy or law</th>
<th>CBDWO perspectives</th>
<th>Government agency perspectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal agreement between ICAA and CBDWO</td>
<td>If you don’t sign the agreement, it’s bad, and you don’t have any rights with ICAA, but you don’t receive any benefits. People think that when we sign the agreement with ICAA we will be directly accountable to them. There are a lot of committees that haven’t signed the agreement, that don’t want to become ASADAS [formal CBDWO], because they say that it’s like giving what belongs to the community to the government. This is not true, they don’t take anything away from you, they simply delegate the management so we can work.</td>
<td>In Turrialba we have a lot of resistance to signing the agreement because they think that if they sign it, then ICAA can take the CBDWO away from them. That’s what they think… CBDWO provide a public service, and public services belong to the state so one cannot escape the State’s responsibility for the CBDWO. So we have to explain to them [CBDWO], nobody is going to take anything away from you, you are going to continue to manage the CBDWO, but there has to be formal documentation required by the government inspectors that shows that you are managing it. That’s the agreement.</td>
</tr>
<tr>
<td>Water service fees charged by CBDWO</td>
<td>For the moment, the committee is saying that hopefully we aren’t thinking about increasing fees. In the past we have considered increasing fees, even if only a little bit…but not now…it would be hard for some families, even with a small increase…people get angry when we talk about increasing fees. We haven’t tried more due to the low income in this community, we are a totally rural community and the income is low. When the new President was elected, the fees being charged were not enough to do what needed to be done… what we were charging couldn’t cover maintenance costs, so we decided to increase the fees to the legal level, and honestly this has helped us very much.</td>
<td>In Turrialba people don’t want to pay the fees established by ARESEP, they absolutely don’t want to. In many parts of the country they do, but in Turrialba this resistance is common… we have tried to enforce this because it is a law and we can’t not respect it, but we can’t force them to follow it…but without having sufficient financial resources they can’t hire accountants…and they lack water treatment. There are a series of things about not charging the legal fees that make them very vulnerable. The problem is that CBDWO are poor businesses precisely because they don’t charge what water is really worth, so they don’t have resources available to invest in the system.</td>
</tr>
<tr>
<td>Installation of household meters</td>
<td>No, no meters here, because we have sufficient water, water isn’t scarce here. In the dry season water is scarce, there’s not enough. In reality, we aren’t educated and we waste a lot of water, so with support from the CBDWO maybe in the future we will have to install meters, but people don’t accept the idea yet. So we have to work little by little trying to make them see that, with support from ICAA, what’s best for the community, and most importantly learn to teach ourselves to conserve this liquid. I tell people that it’s not a bad idea, to improve a little bit how we use water, the liquid that gives us life. Because without water we are nothing. Because with meters if you waste it, you pay for it. Because water is very valuable.</td>
<td>We have a lot of laws in this country, it’s a fantastic country with a whole lot of laws…but they aren’t applied. I have been explaining to them [CBDWO] the importance of the meters policy because they waste a lot of water…but they don’t want to talk about installing meters and being charged for the water they use.</td>
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</table>
Relationships between CBDWO and government agencies

A key role of government agencies is to ensure that citizens follow established rules and laws. However, CBDWO reluctance to implement the laws presented above is often in order to respect citizen resistance to increased government control and fear of losing local autonomy. This resistance could be a reflection of historical trends of limited government involvement in the rural water sector. For example, devolution of responsibility for drinking water management to CBDWO could be seen as giving communities more power and autonomy. However, the existing decentralization policy as an unfunded mandate (i.e., without a transfer of financial resources) could also be viewed as government failure to attend to the needs of the rural sector. Both CBDWO and government agencies recognized the lack of attention paid to the rural sector historically and currently.

For many years the State hasn’t cared about supplying potable drinking water, it’s given less importance… just recently with this administration, water has begun to play an important role, and there has been a big boost for rural areas, at least now they are taking us into consideration. (Government Agency)

ICAA works a little better in the urban zones, but they are lacking in the rural zones. (CBDWO)

Maybe, maybe ICAA has reduced the attention they give to CBDWO in rural areas, they worsened a lot, but as of a couple of years ago they tried to improve their image, but ICAA deteriorated again, in the rural areas they have deteriorated too much. ICAA has neglected the rural areas… the advisers for rural areas haven’t come back, the adviser is never here. (CBDWO)

CBDWO desire increased agency support for financial, technical, and capacity building. One CBDWO representative pointed out that even after signing the formal agreement with ICAA, they have not received agency support, reflecting that ICAA’s main goal was to get them to sign the agreement, rather than offer support.
ICAA doesn’t help us with anything. We haven’t received even five dollars from ICAA and after we became a formal CBDWO [by signing the formal agreement] they didn’t even come, the ones who came here to meet with the community, they never came back, never again. They were coming here so we would sign the agreement. And we signed it and they never came back. (CBDWO)

Agency representatives recognized that CBDWO would like to see more agency presence in communities and admit that they need to improve their support for rural CBDWO.

They ask us for more presence, for us to support them more. (Government Agency)

We should have more presence… the institution needs to have more presence, we have to show up more often. (Government Agency)

And another agency representative acknowledged the lack of attention paid to CBDWO in small communities and highlighted the importance of supporting them in particular.

Many CBDWO are very poor... for example there are CBDWO with twenty-four users and the majority are poor people, so it’s hard for those CBDWO to improve their conditions, and ICAA doesn’t support the CBDWO very much even though they are responsible. Most often CBDWO have to work alone trying to see how they can get resources and loans, and they have problems with materials and water distribution, and some people don’t pay for their water or they pay very little. (Government Agency)

It is clear that government agencies want to help improve drinking water management in rural communities. While agency representatives emphasized the role of the State in strengthening political will and commitment to investing in the rural water sector, they also stressed the need for State support for agencies. One agency representative expressed frustration about having to constantly lobby for adequate State commitment to the water sector in general.
The government should be more involved in this. I mean potable water should be one of the top priorities for the government. The first goal should be to establish the priority, but who is going to do it… none of the Executive Presidents in this institution have been able to achieve that the government sees water as a priority… as an institution we should be the voice, right, to say, hey, you are planning to build another freeway, but potable water needs investment, where are we going to get the resources? The institution doesn’t have them… up until now water has not been a priority. It’s our role to put it on the table and keep hammering, hammering and hammering about water, water, water. (Government Agency)

While agency representatives pointed out the consequences of the lack of attention paid to the rural sector historically, some claimed that the current rural drinking water situation is adequate. An overly optimistic perception of adequacy might hinder agencies from garnering the political will and commitment to investing in the rural water sector that they desire.

Water in rural areas, I’d consider it pretty acceptable. Why? Because we have reached 97% of the population in the country… there are still five hundred communities without water, very small communities… the most important is that people have access to water in their homes… and access to water in rural areas is much higher than in other countries, and efforts have been huge, all that has been done with limited resources, I’m satisfied, there’s a lot left to do, but I am satisfied with what has been done so far. (Government Agency)

A high percentage of the population has water suitable for human consumption. At least in this region around Cartago we don’t have problems like other regions… Up until now we have had considerably good, quality water and we haven’t seen extreme situations that put the quality of the water in this region at risk. Currently there are certain elements are appearing in the water that could be damaging to health, but in other regions… the quality here is normal, good quality water, even though you can find coliforms in places without proper care, but this is relatively treatable, right, not like other types of contamination that are very dangerous. (Government Agency)

In addition, one agency representative’s disappointment about not being able to hide potentially harmful consequences of drinking water contamination from an increasingly educated population reflects a lack of transparency and respect for CBDWO.
The level of education among the population has increased, so now it is more difficult to keep hidden the problem of water quality. (Government Agency)

Government agency representatives’ attitudes and actions influence their relationships with CBDWO. For example, the fact that government goals related to drinking water are unknown or unclear to CBDWO is likely contributing to CBDWO distrust and skepticism toward agencies.

No, I haven’t heard, well I don’t know, I haven’t heard myself that they [government] have any certain goals. (CBDWO)

Honestly I can’t tell you anything about [their goals] because I don’t know what it is that they want. (CBDWO)

About government goals, I do not, do not, do not, see… what vision they have for water… I ask myself what is the goal of the government of Costa Rica… I don’t see it anywhere. (CBDWO)

Without a clear sense of government goals regarding water resources, it is hard to imagine rural citizens gaining trust for agencies. It is also difficult for agencies to build positive relationships based on trust without a consistent presence in communities. Government agencies reported lacking the financial and human resources necessary to maintain a constructive presence, develop positive relationships, and contribute substantively to development of infrastructure and governance in rural communities. With only one ICAA representative responsible for overseeing an entire region of 150-200 CBDWO, the agency’s ability to fulfill their supportive role is compromised. With this limitation in human resources, it is difficult to maintain the consistent presence and level of attention desired by CBDWO and agency representatives. Moreover, when agency representatives do show up in a rural community, they are attempting to achieve their goals of increasing compliance with
laws and regulations on a very tight timeline and without offering much needed financial support. Several CBDWO representatives expressed frustration about the communication style of agency representatives. For example, one CBDWO representative explains that agency focus on legal discussions scare community members, and another explains how threats from agency representatives for not following ICAA regulations disregard the dedicated volunteer work that he does for his community and make him feel disrespected.

In the meetings that they [ICAA] had with us, we got the town together with them, and they [ICAA] would only talk about the law, and since they would only talk about the law, you see, they scared everyone. And if someone from ICAA were here right now, I would say the same thing right in front of them. They scare people when they come here. (CBDWO)

What they told me is this… you are vulnerable that in any moment, anyone can sue you and you can go to jail because you are not accepting to do things the way the law says they should be done. So I told them, ok, if I go to jail for something like that, I know that when the community finds out, they will come get me out because they won’t leave me in there for even a day. I am working for my community, not for myself… So I would have to resign, and if I resign and leave everything abandoned, then we would really have problems because who is going to work for the CBDWO? But they scare me when they come threatening me, that if I don’t do things like they tell me to, that I’m breaking the law, that I’m making myself vulnerable… so I tell them today I give them all the papers, because I don’t want to work like this, being pressured. I want to help. I accepted because there wasn’t anyone else to accept the position. From the first day that I took oath I told everyone at the assembly that I want to work for the CBDWO, so I am going to work for the community, not for me. I am going to do what I can to help the community and I truly feel satisfied with all that I have done, and I have done it all for my community. (CBDWO)

Feeling threatened by agency representatives contributes to distrust toward agencies. Some CBDWO have grown frustrated with feeling like agencies simply tell them what to do, but without offering the types of support they need. One CBDWO representative expressed a desire for agencies to show up in communities offering resources and support rather than
injecting fear, and reiterated that this approach would help instill confidence and trust among community members.

I would like ICAA to come to my community and get us all together to say, ‘we have come to meet with you today to present some projects that we have for all of the CBDWO, including the rural CBDWO like you. And the project that we have is for you to improve your storage tanks and pipes, and the way we are going to do it is by starting to give you financial support.’ This would make people trust ICAA, but no, they only come here to tell us ‘with this you can’t survive, you have to charge higher fees.’ They just want to take advantage of the community. Imagine if they came to offer support, saying ‘You need another storage tank. Here’s our proposal, we will give you 70%...and you put 30%.’ We aren’t going to say no... But they don’t come to cheer up the community, encouraging the community like this, ok, this has to improve, so ICAA comes to the communities to offer support, not fear. Up until now, I’m telling you how they come here, the people who work for ICAA come here and frighten the community. (CBDWO)

Although well intentioned on the part of agencies, their communication style often results in increased animosity toward agencies instead of increased motivation to follow laws. In addition, these interactions leave agency representatives increasingly frustrated with seemingly unnecessary resistance among CBDWO. Whereas agencies prioritize enforcement and compliance with laws and regulations to improve rural drinking water, CBDWO perspectives reiterate the importance of communication style and relationships in achieving such goals.

Projections

The next step in problem orientation is to use understanding of trends and conditions to make projections about future trends and evaluate the likelihood that identified goals will be achieved (Clark 2002).
Many improvements to drinking water systems and community-based management have been observed in recent decades. However, dominant trends and conditions that emerged from this analysis illuminate existing uncertainty about the likelihood that certain goals shared by CBDWO and government agencies will be achieved. There are clear threats to the quantity and quality of potable water in these rural communities given the lack of information, monitoring systems and adequate protection measures. It is also clear that relationships between CBDWO and agency representatives undermine the adoption of laws and practices designed to support community-based management of drinking water. Based on these trends and conditions it is likely that CBDWO and government agencies will continue to face challenges in meeting these shared goals. Risk of failing to achieve goals for consistent access to sufficient and high quality drinking water increases the vulnerability of rural communities.

While CBDWO and government agency representatives share goals for rural drinking water governance, different perspectives about how to achieve such goals has led to increased perceived conflict and movement away from meeting common goals. One agency representative recognized this tension in spite of wanting the same thing.

We have the same objective to improve water resource management in the communities, and if this is our objective, then why are we all pulling in different directions? (Government Agency)

Given that both CBDWO and government agency representatives emphasized the value of actors in the water sector working together to achieve common goals, there are clear opportunities to serve the common interest. This expressed desire to serve the common
interest will be a valuable asset when identifying and implementing alternatives to achieve these common goals.

**Alternatives**

The next step in problem orientation is to identify potential alternatives to address challenges and achieve goals. I used normative attributes of *good* governance as sensitizing concepts in the coding process to analyze multiple perspectives about rural water governance in this context. This analysis included identifying attributes of governance that exist, need more attention, and are desired by stakeholders in this context. Emergent themes revealed key attributes of governance that would contribute to moving toward achieving shared goals and four alternatives as strategies to strengthen these key attributes of governance (Table 2.3).

Table 2.3. Alternatives to strengthen key attribute of governance and move toward achieving shared goals.

<table>
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<tr>
<th>Alternatives</th>
<th>Key Attributes of Governance Strengthened</th>
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<td>1. Increase financial investment in the rural water sector</td>
<td>Policy responsiveness, Accountability</td>
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<tr>
<td>2. Develop a shared monitoring system for drinking water quantity and quality</td>
<td>Knowledge, Collaboration, Monitoring</td>
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<td>3. Define spring protection areas by watershed</td>
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*Alternative 1: Increase financial investment in the rural water sector to strengthen policy responsiveness and accountability*
Opportunities to increase financial investment in the rural water sector exist on behalf of national government, CBDWO and citizens. These opportunities would strengthen two key attributes of governance – responsiveness and accountability – in this system.

Community-based management of rural drinking water in Costa Rica has the advantage of transferring authority and power to local citizens who have the most knowledge and understanding of their resource systems (Andersson et al. 2004; Brunner et al. 2005; Ostrom et al. 1993; Wondolleck and Yaffee 2000). However, caution must be taken not to assume that decentralization of natural resource governance will inevitably result in greater democracy and efficiency (Andersson and Ostrom 2008; Armitage 2008; Ostrom et al. 2007; Reed and Bruyneel 2010). As the regulation establishing CBDWO (Costa Rica Government 2005a) does not include provision of funds for drinking water service administration, some view this decentralization policy as the government washing its hands of responsibility for the rural sector whose needs they were unable to meet through previously more centralized municipal provision of water services. Unfunded mandates – orders imposed upon local governments to carry out national policies without a transfer of financial resources – often reflect a lack of accountability on the part of the central government (Posner 1998). It has been recommended that central governments transfer sufficient and appropriate powers to local democratic institutions for successful decentralization of natural resource governance (Ribot 2002).
In interviews for this research, agencies emphasized the need to make rural water a national priority and advocate for greater political commitment to the rural water sector that translates into allocation of government funds to agencies to enhance support for CBDWO.

However, direct investment by the national government is not the only option for increasing financial investment in this sector. One agency representative interviewed proposed the creation of an investment fund to make credit more accessible and affordable for CBDWO.

It would be ideal if they [CBDWO] had resources, an investment fund created by the CBDWO themselves, that they could get low interest loans from… that all CBDWO could access… and with strong regulations so it doesn’t end up being like a piñata… it is possible to create and for everyone to contribute so they can access subsidized low interest loans. (Government Agency)

There is also a clear role for CBDWO to contribute to increasing financial investment in the rural water sector. Both CBDWO and agency representatives pointed out the need for CBDWO to operate formally like a business. This includes implementing adequate administrative practices, fulfilling legal requirements and maintaining a revenue stream in order to make necessary system improvements to guarantee high quality service provision.

A key component of CBDWO operating like a business and maintaining a necessary revenue stream is charging adequate fees for water service provision. Both agency and CBDWO representatives express a desire to strengthen CBDWO ability to implement legal rates by garnering citizen support for increased fees. Trends and conditions show that CBDWO representatives are often placed in difficult situations when making decisions about water service rates. These dedicated volunteers have to balance the need to increase user fees for
water services and pressure from agencies to do so, with the desire to respect citizen demands for cheap, affordable drinking water and maintain a positive reputation in their communities. The struggle for local institutions to collect sufficient fees has led to under-pricing of tap water and insufficient infrastructure and service provision in neighboring Nicaragua as well (Vásquez and Franceschi 2013). Increasing water service rates to nationally established levels is a viable, although somewhat contentious, option to increase investment in their own communities. There is a clear need for CBDWO to develop mechanisms to open healthy discussions within their communities in order to build awareness and support for this decision among rural citizens. It is possible that if citizens perceive that they are investing in their own communities, while reducing fear that the government could take it away from them, progress could be made on this front. Implementing higher rates will likely require carefully crafted educational opportunities at the local level (Vásquez and Franceschi 2013), and communities in the region who have achieved shifts in perspectives and increased rates could be instrumental in assisting the design and implementation of such strategies.

Increasing financial investment in the rural water sector is a viable alternative to improve rural drinking water governance by strengthening key attributes of responsiveness and accountability. As allocation of sufficient funds is essential for the effectiveness of a formal policy (Clark 2002), increased targeted government investment would make CBDWO policy decisions more responsive to meet needs of rural citizens. Such financial responsiveness would also allow agencies to better fulfill their commitments to CBDWO and rural citizens. This level of commitment from the government would, in turn, reflect clear objectives to rural citizens including CBDWO representatives. Trends and conditions revealed that
government goals related to water are often not clear to rural citizens, resulting in skepticism about national support for the rural water sector and a lack of trust in government to prioritize rural livelihoods. Adequate agency funding would also reflect a greater sense of government accountability by providing opportunities for CBDWO to hold agencies accountable for fulfilling their formally established roles and responsibilities. Ability to hold authorities accountable can contribute to social justice and a reduction in threats perceived when compliance with rules is enforced (Lebel et al. 2006). This in turn, would increase CBDWO accountability to providing high quality drinking water services in rural communities.

Implementing these options for financial investment will also rely on attributes of governance related to interactions, as I will discuss below.

In addition to improving responsiveness and accountability, increasing financial investment in the rural water sector would also contribute to increasing self-sufficiency among CBDWO, and a reduced sense of paternalism or dependency. This might sound contradictory; however, government funding can reinforce an agency’s ability to provide necessary support and promote desired local self-sufficiency. Both CBDWO and agency representatives are eager for strengthening of CBDWO capacities, and financial investment is one essential piece to achieve this. Available funds will also help with implementation of other identified alternatives and strengthening other attributes of governance.
Alternative 2: Develop a shared monitoring system for drinking water quantity and quality to strengthen knowledge, collaboration, and monitoring

Knowledge, collaboration, and monitoring have key roles in reducing uncertainty about drinking water resources and vulnerability of rural populations. One government agency representative clearly expressed the role of knowledge in reducing risk and vulnerability for rural populations.

I think that more knowledge means less risk. Yes, that is clear, so it is better to know more. (Government Agency)

Knowledge about specific resources and the larger biophysical system is important for effective natural resource management (Dietz et al. 2003; Knuppe and Pahl-Wostl 2011). Specifically, effective groundwater governance requires collection of data on hydrogeologic processes, as well as open sharing of this information between scientists and managers (Mukherji and Shah 2005). Data about groundwater recharge zones, flow pathways and potential contamination pathways are needed in Costa Rica, but expensive hydrogeologic studies required to collect this information are largely lacking (Gentes and Madrigal 2009). While there are some examples of state investment in hydrogeological studies in Costa Rica, there is much room for expanding these efforts, particularly to benefit rural populations.

Knowledge about water quantity and quality, how these are affected by influencing factors on the landscape, and how they change over time, is critical for effective management of drinking water resources. For example, increasing the frequency and robustness of water quality testing and spring flow monitoring are needed in this context. A monitoring system to collect, analyze and share this type of information would reduce uncertainty and vulnerability
by creating an effective early warning system that would allow both CBDWO and agency representatives to make evidence-based decisions for prevention and mitigation of potentially harmful events (Lebel et al. 2006). While local level monitoring (i.e., carried out by CBDWO) would be more efficient for informing local actions than through a single centralized system (i.e., one regional agency), monitoring systems shared among local and regional or national actors would allow for necessary actions at multiple levels (Lebel et al. 2006). Monitoring data collected by CBDWO would provide important information about water quality and quantity at the local level, whereas currently ICAA reports such data as national averages of the rural sector. While these aggregated data allows observation of national trends, it does not allow for identifying problems and developing necessary solutions at the local level (Dietz et al. 2003). Shared monitoring systems that promote robust data collection and transparent information sharing are essential for effective governance of water resources (Bunn et al. 2010).

A shared monitoring system in this particular context could consist of water quality and quantity data collection by CBDWO, collaboration among regional CBDWO and between CBDWO and government agencies to share data and create a collective database. This type of a system integrating scientific, local and policy knowledge and promoting cross-scale collaboration would contribute to improving rural drinking water governance (Ascher et al. 2010). Vertical integration, or collaboration and knowledge sharing among actors at different levels of governance, is important for the sustainable, adaptive management of water resources (Knuppe and Pahl-Wostl 2011). While data collected locally and shared regionally would increase capacity for local responsiveness, it is also important that the central
government pay close attention to changes in key indicators (Ribot 2002). There is also a clear role for government agencies in creating rules and oversight mechanisms to promote collaborative leadership among local actors that contributes to this adaptive governance (Stiftel and Scholz 2005).

Collaboration may not be the goal of natural resource management per se, but it can be a tool to improve the effectiveness of management or governance (Wondolleck and Yafee 2000). There is much evidence that enhancing attributes of good governance such as knowledge and collaboration in this way would contribute to building understanding through information exchange, providing a mechanism for effective decision making across scales, and developing capacities of agencies and communities to deal with future challenges (Wondolleck and Yafee 2000). In developing a shared monitoring system, it is important to keep in mind that appropriate participation of local stakeholders and managers in the planning and decision-making processes is key for successful implementation of new monitoring tools (Knuppe and Pahl-Wostl 2011). Therefore, taking an inclusive, collaborative approach to planning and developing this shared monitoring system with stakeholders at local, regional, and national levels, is recommended.

Alternative 3: Define spring protection areas by watershed to strengthen policy responsiveness and effectiveness

Laws that define protection zones around springs in Costa Rica do not effectively protect watersheds and spring water resources. Most of the land within established protection zones (i.e., rings with 100-200 meter radius around springs) is not contributing to the spring water,
and areas of land (i.e., watersheds) contributing directly to the quality and quantity of drinking water remain largely unprotected. This type of mismatch between the scales of water resource management and biophysical provision on the landscape is widespread (Cash et al. 2006, Dore and Lebel 2010, Fremier et al. 2013, Moss and Newig 2010). In addition, trends and conditions display how inconsistent enforcement of these laws among small landholders is often perceived as unjust. Effective policies that respond to the needs of citizens are important for achieving societal goals and reflecting legitimacy (Pangare et al. 2006; Solanes and Jouravlev 2006; Klijn and Edelenbos 2012, Lasswell 1971). And policies that can be enforced fairly and impartially promote social justice and democratic ideals (Dietz et al. 2003; Lebel et al. 2006; UNDP 1997). Redefining spring protection areas with a watershed focus is an opportunity to promote good governance in this system by improving responsiveness and effectiveness of water resource policy.

Redefining spring protection areas as the watershed, or upslope area contributing to the spring, would shift the focus of CBDWO management actions to an area more likely to be affecting springs. Although changes in legislation most often require long-term processes, a mechanism to shift CBDWO management focus in the meanwhile could be devised by actors in this context. Development of a shared monitoring plan for CBDWO in collaboration with government agencies, as described above, could help achieve this shift and increase ability to identify factors that negatively influence spring water and to prevent and mitigate their impacts.
Redefining spring protection areas as watersheds would contribute to the continued development and promotion of watershed scale management for water resources in Costa Rica. A vision toward watershed scale management is made evident in the MINAE National Plan for water resources management (Costa Rica Government 2010) and a new water law with this vision was recently passed (Costa Rica Government 2014). This law is based on Integrated Water Resource Management (IWRM), an approach used globally to promote establishing the basin as the territorial unit for management (Pangare et al. 2006). Although watershed scale management has yet to be operationalized and implemented at the national level in Costa Rica, there are examples of efforts for watershed scale perspectives in the country (Marchena 2009; University of Costa Rica 2013). However, these efforts do not currently allow CBDWO to focus their management actions at the watersheds contributing to springs. There is clearly a role for CBDWO as active participants in the development and implementation of watershed management in Costa Rica, although this remains undefined. Redefining spring protection areas, together with establishing a shared monitoring system, could contribute substantially to this continued policy discussion in Costa Rica.

Alternative 4: Improve the quality of interactions between CBDWO and agency representatives to strengthen participation, deliberation, communication and trust

Effective policy is not guaranteed with a government structure and a formal legal framework developed within that structure. Effective governance is reliant upon the relationships among actors at local, municipal and national levels and these relationships are defined by the overall context in which institutions are embedded (Andersson and Ostrom 2008). It is clear in this Costa Rican case that relationships matter. The attributes of good governance provide
insight for overcoming this challenging situation. Decision-making processes in governance systems often focus almost entirely on resulting policies and pay limited attention to the process used to design and implement policy options (Dovers and Hezri 2010; Majone 1989). However, carefully designed governance processes can help improve the quality of interactions among participants, which are influenced heavily by attributes of good governance. It appears that key attributes to strengthen in this particular case are participation, communication, deliberation, and trust.

As stakeholders involved in implementing policies are often not included in policy design processes (Fischer 2000), greater attention can be given to individual or specific interests, making it difficult to identify and advance toward common goals (Brunner 2002; Clark 2002). Moreover, failing to adequately consider stakeholders and their interests in policy discussions can result in poor acceptance of decisions and difficulties in implementing programs and policies on the ground (Brunner et al. 2005; Fisher et al. 1991; Knuppe and Pahl-Wostl 2011; Rowe and Frewer 2004). The notion that “when people deliberate in a fair and open process, they naturally tend to accept the result” (Stiftel and Scholz 2005:235) is widely assumed in academic and practitioner-oriented literatures (Fisher et al. 1991; Hill et al 2011; Rowe and Frewer 2004; Susskind and Cruikshank 1987; Webler and Tuler 2000). Democratic legitimacy, or preparedness to accept policy decisions, is more reliant on authorities and citizens perceiving a decision-making process as adequate than the actual content of the decision (Klijn and Edelenbos 2012). Public involvement in policy making processes can increase the legitimacy of local governing bodies and public officials, thereby
increasing support for proposed initiatives, and improving communication between citizens and local governments (Marquart-Pyatt and Petrzelka 2008).

While increasing opportunities for CBDWO and rural citizens to participate with government agencies in policy processes would improve governance in this case, participation alone will not guarantee better results. Developing processes for CBDWO and government agency representatives to engage in open communication and deliberation that foster trust is a potential alternative to improve the quality of interactions between these groups and allow for effective governance outcomes. Collaborative natural resource management can create new opportunities for interaction among stakeholder groups that foster flexible mind-sets to help individuals reframe their focus on problems (Wondolleck and Yaffee 2000). Spaces for open communication and deliberation in policy making and implementation processes allow all stakeholders to be heard and contribute fully; traditional bureaucratic, administrative approaches do not foster these spaces (Susskind 2005). Deliberative methods for collaboration and participation aim to create a more comprehensive understanding of problems by revealing the different perspectives of citizens and government agencies, thereby leading to better decisions (Wondolleck and Yaffee 2000). These types of collaborations can also improve relationships by helping stakeholders recognize that partnerships are made up of people not institutions (Brunner 2002).

Trust is often underestimated in conventional top-down management processes (Armitage 2008), but is a key element of positive social interactions and effective collaborations. While a sense of trust is important for successfully initiating collaborative efforts, building
collaborations and trust is an iterative process. Collaborations grounded in a *good* process, (i.e., emphasizing attributes of *good* governance) build trust and foster mutual respect among participants regardless of their positions on issues (Folke et al. 2005; Brunner et al. 2005). While trust creates a sense of community and makes it easier for people to work together (Shannon 1990), trust also contributes to legitimacy (Schneider et al. 2003). Public authorities play a key role in building leadership and trust through collaborations that help transform organizations toward a participatory learning environment (Folke et al. 2005; Stiftel and Scholz 2005; Wondolleck and Yaffee 2000).

Analysis of trends and conditions shows that many CBDWO and rural citizens in this region do not feel that the policy making and implementation processes are open, fair and *good*. It is also clear that government agency representatives are unsatisfied with the level of acceptance of decisions, reflected in low rates of compliance with key policies. Although these policies aim to improve drinking water service provision and support rural livelihoods, the process of implementing them in this region is not working well. Extensive theoretical and empirical evidence supports the notion that an intentional process for open communication and deliberation around perspectives about these policies could result in increased acceptance and compliance. Building such a process would provide a space for CBDWO and agency representatives to recognize their shared goals for rural drinking water resources and work together to develop mutually beneficial strategies to achieve them. In this particular case in Costa Rica, developing a process for decision-making and implementation that prioritizes improving the quality of interactions between CBDWO and agency representatives could help make huge strides toward achieving goals for policy compliance and improved rural drinking water governance. While numerous resources are available in academic and
practitioner-oriented literatures to assist in the design and implementation of such processes (e.g., Bunker et al. 2006; Chambers 2002; United Nations 2007), it is important that processes are carefully crafted to meet the needs of participants in this specific context.

These four alternatives are not the only options to achieve shared goals or improving rural water governance in this context. However, since they were identified through careful analysis of multiple perspectives and principles of governance commonly accepted as universal (Graham et al. 2003), they are a reasonable contribution to moving toward achieving shared goals for rural drinking water governance in this Costa Rican context. In addition, focusing on key attributes that emerged from this analysis may result in improvements for other attributes as well, thereby enhancing the effects of applying these alternatives.

**Conclusions**

Uncertainties about the quality and quantity of drinking water resources are a source of vulnerability for rural populations in Costa Rica. Both CBDWO and government agencies share goals for sustainable drinking water resources and community-based management; however, trends and conditions present risks to achieving these goals. Analysis of multiple stakeholder perspectives revealed opportunities to develop governance options to address this uncertainty and vulnerability, and achieve goals to serve the common interest. This analysis revealed attributes of *good* governance that appear to be most critical in this case—responsiveness and effectiveness of policies, accountability mechanisms, monitoring and knowledge sharing, and interactions based on communication, deliberation and trust-
four alternatives to strengthen these attributes. Focusing on these alternatives and key attributes will, in turn, strengthen other attributes and enhance the effects of investing in these efforts.

Natural resource governance problems abound. Developing good governance contributes to improving policy by promoting human dignity (Mattson and Clark 2011) and serving the common interest (Clark 2002). The method used in this study uses problem orientation from the policy sciences to analyze multiple perspectives, which are key for identifying the common interest. In this analysis normative attributes of good governance provided a tool for discovering alternatives that contribute to solving governance problems by advancing the common interest. This method serves as a practical approach to policy analysis in this context. In addition, this approach contributes to the theoretical and methodological development of governance studies, and achieving shared goals for sustainability of natural resources and human dignity. Although the findings and interpretations are specific to this case study, the process or method of using problem orientation and attributes of good governance is generalizable and can be used to analyze problems related to governance in other contexts.
References


