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WATER GOVERNANCE IN THE STATE OF SAO PAULO, BRAZIL: FIRST PERCEPTIONS AND FURTHER REFLECTIONS

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The world water crisis has been regarded as a governance crisis by some authors. They sustain that the way to improve the water quality and availability is to improve the water governance. Although the term governance is still not a consensus, it is well accepted that it is truly necessary to improve it in order to get good water management in four identified dimensions: environmental, social, economic and political. We have analysed two dissertations which show quite different opinions about the current state of Water Governance by watershed committees in the state of Sao Paulo, Brazil. We have shown that it is primordial to adopt a constructivist paradigm to promote a better governance. Finally, we suggest that MCDA (multiple criteria decision aid) can provide us with this new paradigm to improve the water governance, besides other complex contexts.

Keywords: Governance. Water Management. Sustainable Development.

1 INTRODUCTION

Since the Second World Water Forum in The Hague, Netherlands, in 2000, there has been a common sense that the water crisis is a governance crisis (GWP, 2002). The consensus is that the water crisis has been happening because there is bad management. This bad management includes lack of appropriated analysis, corruption, lack of adequate institutions, bureaucratic delays and lack of enough people able to face the problem (BARBI, 2007).

1.1 Early perceptions about governance and water governance

"A phenomenon of the last 20 years has been the rapid rise of network from governance. This governance form has received significant scholarly attention, but, to date, no comprehensive theory for it has been advanced" (JONES; HESTERLY; BORGATTI, 1997, p. 911).

Sartori (2013) has found out that the term "governance" does not have a complete definition. According to Sartori (2013), the meaning of "governance" is still being built, so it is neither accurate nor unique yet.

According to Kooiman et al. (2008), "governance", in its general sense, suggests that not only does the state but also private and civil society have significant roles in the governing of modern societies, from local to international levels. Interactive governance places the interactions among institutions belonging to these societal parties.

The governance directly influences the governability. The governability depends on the

level of maturity in an organized society and also on its capacity for assuming shared responsibilities in the implementation of decisions and in the art of governing well. Governability is related to political and institutional stability with efficiency and efficacy in public administration and decision-making.

Kooiman et al. (2008) define governability as the governance status of a societal sector or system. The performance of such governability should be evaluated by regarding or not its components in a systemic and coherent analytical form. The authors approach three components: the system-to-be-governed, its governing system and governance interactions. And they insist that we should distinguish and conceptualize these three components in order to find an approach which will be able to assess the process of the governability of societal systems.

Jones, Hesterly & Borgatti (1997) state that a challenge in governance researches is to define network membership. We comprehend this point by the stakeholder mapping approach, which will be discussed later in this paper.

To introduce the concern of Water Governance, we would like to reproduce the Water Governance Facility (WGF) (2013) statements:

Water governance is defined by the political, social, economic and administrative systems that are in place, and which directly or indirectly affect the use, development and management of water resources and the water service delivery at different levels of

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a society. Importantly, the water sector is a part of broader social, political and economic developments and thus it is also affected by decisions outside of the water sector (WGF, 2013).

WGF (2013) addresses the main issues which should be regarded in the water governance:

1. Principles such as equity and efficiency in water resource and services allocation and distribution, water administration based on catchments, the need for integrated water management approaches and the need to balance water use between socio-economic activities and ecosystems.
2. The formulation, establishment and implementation of water policies, legislation and institutions.
3. Clarification of the roles of the government, the civil society and the private sector and their responsibilities regarding ownership, management and administration of water resources and services, for example:
 - Inter-sectoral dialogue and co-ordination;
 - Stakeholder participation and conflict resolution;
 - Water rights and permits;
 - The role of women in water management;
 - Water quantity and quality standards;
 - Bureaucratic obstacles and corruption;
 - Price regulation and subsidies;
 - Tax incentives and credits.

According to WGF (2013), the water governance has four dimensions:

- The environmental dimension, which aims at the sustainable use;
- The social dimension, which aims at the equitable use;
- The economic dimension, which aims at the efficient use; and,
- The political dimension, which aims at the equal democratic opportunities.

Bucknall & Damania (2006) state that the water governance is a challenge for any corporation or public service. They sustain that water has several

characteristics, which present additional complications for the governance. Among them:

- Water has an emotional and often spiritual dimension for many users.
- Rivers, lakes, coastlines, aquifers and infrastructure are often common-pool resources, that is, when one member of a group uses the resource it is not available for others in that group and it is possible for members of the group to stop others from getting access to it.
- There is significant uncertainty about the amount and quality of water available from year to year, in terms of both stocks and flows.
- Investments in water infrastructure provide a mix of public and private benefits. A dam, for example, provides public benefits such as flood protection, but also stores water for individual households or businesses to use.
- Water management often requires large investments of public funds that are difficult for the general public to evaluate at the planning stage and are vulnerable to be captured by special interests.
- Water resources must usually be managed across different time frames and at different scales (local, regional, national, international).

Finally, besides the advances that have happened in the last 15 years, we believe that there is still a lot of work to be done.

3 THE WATER GOVERNANCE IN THE STATE OF SAO PAULO, BRAZIL

According to Brannstrom (2004), the governance should be more decentralized. This fact could bring a higher public participation in the decision making process, which would improve the efficiency, equity and development in terms of its management. Barbi (2007) believes that the Brazilian watershed committees (CBH – the acronym in Portuguese) are the best forums where people can debate, negotiate and articulate in an organized and democratic way.

In the CBHs' management system, the stakeholders participate in the negotiation and decision making process, in which it is possible to discuss and decide what the priorities are in terms of water resources, at least rhetorically. This process highlights the needs for a new and more democratic decision-making process, as it has been required for many authors, such as Jones, Hesterly & Borgatti (1997), Ribeiro & Vargas (2001), among others.

Ribeiro & Vargas (2001) and Ratner (2000) sustain that it is necessary to adopt a new way to make decisions on public subjects. The authors defend that a holistic

view must be adopted, as first presented by Smuts (1926). They support that a holistic paradigm should be regarded to ensure more effective actions. Barbi (2007) has stated that the social participation to change the water management in Brazil for a more democratic, participative and legitimate process is still a challenge.

Besides this challenge, the management system by CBHs has changed the old paradigm, which was centralized and technocratic (BARBI, 2007; ZUFFO, 2011). Porto & Porto (2008) and Zuffo (2011) also sustain that the Brazilian Law has established this paradigm change, aiming at a systemic, integrated and shared water management system. WMO (1992) and Yassuda (1993) confirm that the watershed based on the water management enable the holistic paradigm to work. Randolph (2004) shows sorts of sustainable techniques which can be applied when there is a watershed based on public management.

Barbi (2007) and Sartori (2013) state that the Brazilian water management system has a lot of trade-offs because it is a system with many different interests and thus too many conflicts.

Barbi (2007) believes that there are specific conditions which enable the Sao Paulo CBHs' management system to work well. According to the author, these conditions are: cooperation, confidence, solidarity and reciprocity.

On the other hand, Sartori (2013) sustains that it is still necessary to understand how much of social participation on the CBHs is, in fact, real and effective or if it is just a game to create the illusion that there is popular participation in the decision-making processes of water management. The author thinks that most of the decision makers would like to see changes in the water governance process; they consider that there is low capacity in terms of governance in the Alto Tietê CBH.

While Barbi (2007) affirms that there is a shared management in the Piracicaba, Capivari and Jundiá CBH (PCJ); in contrast, Sartori (2013) sustains that the decision-making processes are centralized at the Alto Tietê CBH.

Barbi (2007) also states that the PCJ negotiated its interests with the Cantareira system very well in 2004, when there was the grant renewal to this system, which provides the water supply to the city of Sao Paulo by taking a great volume of water from the Atibaia River – which joins to the Jaguari River to form the Piracicaba River.

According to Barbi (2007), the PCJ's members have "social assets", which have been built based on cooperation, confidence, solidarity and reciprocity. The author insists that this "social assets" are related to beliefs, traditions and culture. In the Piracicaba county, people have an affective relationship with the river. Thus, Barbi (2007) believes that there is a synergy between the state and the society, related to water governance.

However, recent discoveries by Sartori (2013) show a quite different truth. The author considers that nowadays we have an adequate moment to improve

the water governance, and should listen to the needs of all the society, besides the ones of CBH's members.

Sartori (2013) has compared three CBHs: Alto Tietê, PCJ and Baixo Tietê. The author discovered that there are many differences among the three CBHs' water governance practices. But there is the common aspect of centralized decision-making. And there is a common disgust even among the CBHs' members, which is related to the investment distribution criteria. On the other hand, the author also found out that this disgust can be greater or lesser depending on the context.

Finally, Sartori (2013) supports that good water governance may be achieved considering the concerns of all the stakeholders in the decision-making processes. The author has applied MCDA approach to find out the concerns of some stakeholders, and then he has realized that this approach is a stout but flexible tool for improving governance.

3.1 The water crisis in the state of Sao Paulo

The state of Sao Paulo has been living an unparalleled water crisis. The Cantareira system has gotten a collapsed situation. Despite the fact that Cantareira is the main water supply system for the two biggest metropolitan regions in this State, according to Zuffo (2015), it has been badly managed by the Sao Paulo State Sanitation Company (SABESP) for years, and the collapse situation has been happening for at least two years due to low rainfall.

Zuffo (2015) sustains that the Cantareira system has not been able to supply the capacity for the last five years. Rainfall has been lower than SABESP's water abstraction, which is destined to Sao Paulo. This collapse is due to a discrepancy between SABESP's captured volume and the natural recharging of Cantareira's reservoirs.

The Sao Paulo Government has been responsible for this collapsed situation for the last twenty years. Zuffo (2015) has shown that in the Cantareira's project, which was created in the 1960s, extension works of the reservoirs had been planned to the 1990s. But the Sao Paulo Government did not build the reservoirs' extension; despite it has been alerted for at least the last fifteen years.

The state of Sao Paulo has been governed by the same political party for more than twenty years. This is a hypothesis about the water crisis being due to the bad water governance in Sao Paulo. Besides, it may also be true that the bad water supply management by SABESP is an indicator of large water loss in its system.

It is believed that people need to be conscious and able to make decisions in order to adopt better techniques to solve the problem of lack of water. And they cannot accept to be manipulated by bad governors, but have to claim for good water governance, as attested by Telles & Fantinatti (2015).

4 KEY CONSIDERATIONS TO IMPROVE GOVERNANCE AND WATER GOVERNANCE

Romeiro (2003) sustains that it is necessary to adopt a tool which enables us to regard the concerns

of all stakeholders, besides scientists, researchers, technicians, specialists and politicians. Fantinatti (2011) and Fantinatti, Zuffo & Argollo Ferrão (2014) agree with Bana e Costa, De Corte & Vansnick (2004; 2005), which state that, in order to consider the concern of all stakeholders, it is necessary and essential to take use of the "value-focused thinking" (KEENEY, 1992). Bana e Costa e De Corte & Vansnick (2004; 2005) state that the MCDA (multiple criteria decision aid) is the only effective approach which considers the concern of as many stakeholders as possible. Fantinatti & Zuffo (2011) propose the MCDA approach as a tool which will allow to deal with the conflicts inside the watersheds, aiming at a sustainable use of water resources.

Fantinatti (2011) and Fantinatti & Zuffo (2012) have presented the MCDA method being used to evaluate the Anhumas watershed's current situation and further scenarios, in the city of Campinas, in the state of Sao Paulo, Brazil. The application has regarded the watershed social sustainability, besides the environmental and economic. Their findings have allowed to evaluate the watershed sustainability degree by the stakeholders' value. At the end of the evaluation process, all the involved stakeholders have appointed that the MCDA approach should be applied to all society sectors, aiming at more legitimate and long lasting solutions. They have also felt that the MCDA approach is stout and flexible at the same time.

Therefore, we also believe that the MCDA approach can be the tool which will support the actions to improve the water governance.

5 STAKEHOLDER MAPPING AND MULTIPLE CRITERIA APPROACH: CRUCIAL STEPS FOR GOOD GOVERNANCE

We have found that for good governance, two very important steps are the stakeholder mapping and the multiple criteria decision aid (MCDA). In fact, the stakeholder mapping and their value mapping are mandatory steps within the MCDA approach.

Olander & Landin (2005) have shown that there are various stakeholder mapping techniques. However, Sharma (2003) has shown it is possible to develop stakeholder mapping techniques according to the research objectives. The author suggests that it is necessary to adapt it to a special-purpose typology based on key characteristics of the governance context. The context includes governance mechanisms, society sectors, number of influenced individuals (directly or indirectly), relative performance of various alternatives, effectiveness of governance structures, among others. In addition, the stakeholder interests and power and also the dynamism of the environment must be regarded. "Power and dynamism are relevant factors. Power ranges from low to high, and dynamism ranges from static to dynamic" (OLANDER; LANDIN, 2005, p. 324). Walker, Bourne & Shelley (2008) contribute significantly to this discussion. They present five dimensions which must be regarded in a stakeholder mapping process: 1. political perspectives of stakeholders; 2. purpose and objectives of stakeholders; 3. value of stakeholders; 4. considering

the stakeholders' intervention level; 5. considering the degree of stakeholder enforcement.

Although some authors have considered the stakeholder mapping as the main tool in policy practices (ALIGICA, 2006), we believe that this tool is really a fundamental part in every diagnostic phase of a solving problem process, for any project.

Walker, Bourne & Shelley (2008) have shown a possible and effective combination of two methods for stakeholder mapping. According to the authors, stakeholder mapping is one of the three key skills in project management, which includes the management and the engagement of the stakeholders themselves; however, they consider that this is a tacit skill that requires both intuition and hard capacity of analysis. The authors consider that stakeholder mapping helps everyone involved with the problem to better comprehend a complex situation being examined.

Keeney (1992) states that decision-making traditional methods do not enable to deal with complex contexts which are characterized as uncertain, value conflicts, different levels of power, multiple criteria and uncountable information that are not complete in general. According to the author, dealing with complex contexts requires to regard subjective aspects, making them explicit and quantified. Both subjective aspects, strongly influenced by stakeholders' value, and quantitative aspects, such as costs and physical characteristics must be regarded. The possible alternatives must be evaluated from established objectives. Then, the decision must be supported by all stakeholders' perceptions.

Bana e Costa, De Corte & Vansnick (2004) support Keeney's statements, sustaining that through the MCDA approach we are able to deal with complex situations because of its constructivist paradigm (BELTON; STEWART, 2001; ROY, 1968).

As stated by Fantinatti (2011) and Zuffo (2011), the MCDA constructivist approach does not consider that any problem could be moulded to achieve an optimum answer, neither that there are predefined alternatives. By the constructivist approach, the decision makers must build the evaluation model, stating the problem description and reflecting about the set of evaluation criteria.

Thomaz (2002) sustains that the problem structuring process is the most important phase in the constructivist paradigm. However, it is mandatory that all involved stakeholders take place in the decision-making process. Otherwise, there will be asymmetric information among the stakeholders. This asymmetric information influences the decision-making process, leading it to a non-consensual comprehension about the problem. This detour is due to several factors: politics or ideologies, lack of knowledge, different interests etc. The worse result is the impossibility of sharing understanding.

A problem structuring process aims at increasing the understanding the problem by all involved stakeholders (KEENEY, 1992). The structuring process includes the stakeholder mapping and their cognitive

mapping (individual and collective) to find out the alternatives' evaluation criteria based on the stakeholders' value.

6 VALUE MAPPING

Since stakeholder mapping is complete, the next step is to find out the stakeholders' value. This must be done through cognitive mapping. In practice, cognitive maps must be obtained almost simultaneously to the development of the stakeholder mapping.

The stakeholders' value will provide the alternatives' evaluation criteria. These criteria will orient the decision makers to developing and monitoring policies and strategies. Simão (2005) suggests two main questions to better define the criteria:

- What kind of criteria must be applied to evaluate the investment, regarding a sustainable project?
- What kind of decision-making model is more appropriate to the evaluation process?

Each criterion must be evaluated by stakeholders' value, aiming at fundamental objectives to be achieved. Keeney (1992) states that the mechanisms (actions) which will allow to achieve those objectives must be identified. Bana e Costa & Sanchez-Lopez (2009) recommend that the criteria must be defined by stakeholders who have the best knowledge of the problem. They sustain that these stakeholders can be the decision-makers or an expert group. Finally, Ensslin, Montibeller Neto & Noronha (2001) suggest using two questions which will identify the criteria:

- Why is this concern (objective) important? What are the desired purposes?
- How can the objective be achieved? What are the available means?

Figure 1 illustrates the basic structure of a cognitive mapping, by which are defined the fundamental objectives, the end objectives (desired purposes) and the means objectives (the resources to achieve the end objectives) (ENSSLIN; MONTIBELLER NETO; NORONHA, 2001).

Once the criteria has been defined, their descriptors must be developed, which will allow to develop the value functions for each criterion. Bana e Costa, De Corte & Vansnick (2004, 2005) support Keeney (1992) about the adoption of standardized scales to develop the value functions, avoiding detours in the alternatives' evaluation. Reinforcing this point, the authors sustain that semantic scales, instead of numeric scales, have to be adopted. Besides the definition of the weights among the criteria must follow the same concepts.

7 DECISION CONFERENCE

The last step in the MCDA approach is to get the consensus among the stakeholders. This must be done by decision conference if possible. According to Thomaz (2002), the decision conference is an adequate moment when all decision makers together are able to structure the problem and identify possible alternatives, regarding the different points of view from each decision-maker. The author also affirms that a decision conference has the advantage of providing the commitment of all stakeholders involved in the process. Figure 2 illustrates a decision conference made by Fantinatti (2011).

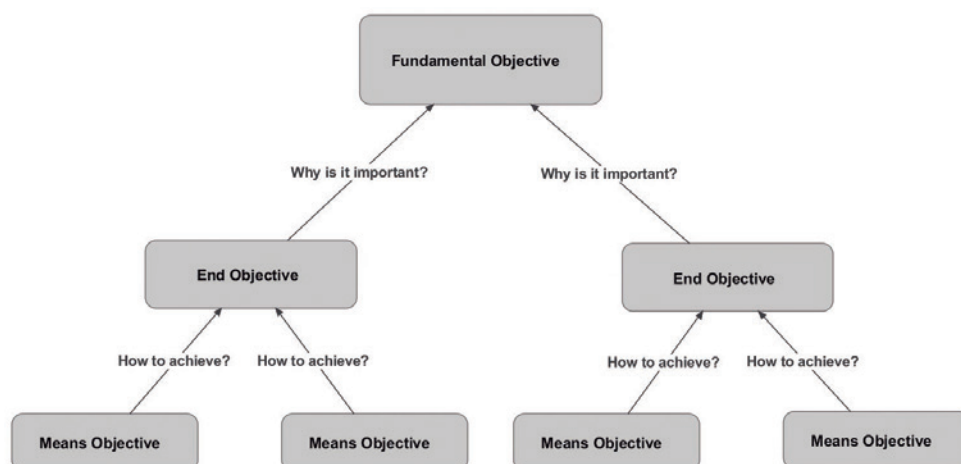


Figure 1 - Cognitive mapping - basic structure. Source: Fantinatti (2011)



Figure 2 - Decision conference session. Source: Fantinatti (2011)

8 CONCLUSIONS AND FURTHER RESEARCHES

We have found that the governance is still a developing concept. We have also revealed that water governance is been built at least in Brazil.

Although there is one author who believes that there is good water governance in the state of Sao Paulo's CBH, we have detected that it is not still a current context. While we were reviewing this paper, a great social and political problem about the lack of water was happening in the state of Sao Paulo. This problem affects the two major watersheds discussed in this study: Alto Tietê and PCJ.

The main cause of the lack of water is related to bad management by Sao Paulo government. This fact comes to corroborate our point of view, that is, there is not a good water governance in the state of Sao Paulo.

We have shown that it is necessary to adopt more effective tools to improve water governance in the state of Sao Paulo, Brazil. And we have pointed that MCDA is an effective tool to promote real water governance (and also governance in general).

In addition, we have noticed that there are various researches which have been applying some other methods which, in fact, are very similar to the MCDA approach in terms of their processes.

Finally, we believe that there should be some effort to stimulate the dialogue among those diversities of researches. This dialogue could merge the discoveries and contribute to improve their results.

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