

Social Network and Group Behavior in a Sustainable Perspective: An Analysis of Conditioning Factors

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Received: Sep. 27, 2012

Accepted: November 30, 2012

Published: January 1, 2013

doi:10.5296/jmr.v5i1.2460

URL: <http://dx.doi.org/10.5296/jmr.v5i1.2460>

Abstract

This paper aims to identify social networking and group behavior characteristics in a Hydrographical Basin Management Committee in Brazil. The study methodological strategy

was the in-depth case study. Group interaction was analyzed by sociometry that revealed the existence of a fully connected social network among members when submitted to professional choice criteria. It is important to mention that interdependency and heterogeneity, along with diversity, make the system viable since they provide it the ability to renew itself as well as the social conditions that allows it to function properly.

Keywords: Social networks, Group behavior, Sustainability, Watershed e sociometry

1. Introduction

Life maintenance on our planet may be the biggest challenge to future generations. The natural resources overuse and the belief that it is an endless source brought worrying consequences to today's society. These consequences have affected the natural environment diversity, with the water matter as one of the most alarming issue. The rivers, for instance, are affected by the human pressures' effects (e.g., the destruction of riparian vegetation). As a result, (human) inhabitants of these areas have to take in into new economics and social worries (e.g., defining rules regarding water's use), generated by the consequent scarcity of this natural resource.

In accordance with global trend, Brazilian legislation has created negotiation and regulation collective forums regarding the water use in hydrographical basins, called Basins Committee. These sites are characterized by the diversity of actors involved, that despite of nature's unpredictable effects, must have the ability to conduct collective agreements regarding water use, measured with equity and social justice.

Human group behavior study has much to contribute to understanding human relationships and interactions in these public sites. Group coexistence promotes social learning for subjects and enables collective acting in favor of goals that are beyond personal needs and interests.

Within this context, this study aims to give answers to the following research questions: *How do we set up a social network between members of the Santa Maria River Hydrographical Basin Management Committee? What are the group's behavior characteristics?*

The study aims to achieve the following research goals: (i), to identify the social network and subgroups (clusters) by professional affinity criteria; (ii), to identify the status of each group member (star, isolated, potential isolated, emerging leader); (iii), to analyze the group sociometric structure; and (iv), to understand the leaders' behavior and dynamics in the group.

The paper is organized in five sections, including this introduction. Section two presents the theoretical grounding; section three presents the research design; section four presents the empirical results of the study; and section five presents the final considerations.

2. Group Interactions, Social Network and Group Behavior

This section begins with the introduction of concepts already known and referred to by several people that came before us, assessing them in an emerging social setting regarding water resources management: the Hydrographical Basin Management Committee.

This social setting has particular characteristics that need our special attention, since its role in society is essential to social behavior transformation, and it must be guided more and more by collaboration, involvement, thoughts and collective actions (IMPERIAL; HENNESSEY, 2000). According to Allen *et al.*, (2001), future projects of natural resources management increasingly require a great emphasis on resources and on the actor's ability to identify the needs, build relationships and bargain roles with several stakeholders.

Therefore, the need to work in collaboration and in multi-stakeholders' network demands a new way of: (i), acting in a group; (ii), sharing the power; (iii), interacting collaboratively; (iv), promoting organizational learning; and (v), using local knowledge. With this in mind, it is important to understand the group behavior, group interaction and social network structure that takes place in the Basin Committees in order to contribute to a more effective performance from these organizations to society.

It is important to consider, as Casey (2005) notes, that organizations have to be considered as dialogue and discussions sites. They can also be seen as networks that inter relate activity systems in which generate their own learning process (WEBLER *et al.*, 1995), strengthening individual and organizational capital (BURT, 1997; GROOTAERT *et al.*, 2006 and NAPHAPIET; GLOSAL, 1998).

Albuquerque; Puente-Palacios (2004, p. 358) observe that "human life is a group", and that groups, in the same way that each person's individuality, influence people's behavior. According to these authors, the reference group supports the group member's behavior and they feel protected by it and motivated to socialize. In the same way that groups are important to us, they are essential to the organizations' life so that, in many times, they make the difference between success and failure of some project. Wagner; Hollenbeck (1999, p. 210) define group as "two or more people that interact with each other in a way that each one influences and is influenced by the others". According to Robbins (2005), a group is two or more individuals together, interdependent and interactive, that get together in order to search for a certain goal. According to the author, groups can be formal or informal. Formal groups are classified by the organization's structure, and the behavior of those who belong to these groups is set and guided by organizational goals. On the other hand, informal groups originate from connections that do not belong to the organization formal structure; they are natural groups that appear on work environment as a response to the social contact need. It is also possible to add the command and task groups to that classification, which are established by formal organization; and the common interests and friendships groups, which are informal connections (Robbins, 2005). Command groups consist of a boss and his subordinates; task groups gather people for doing certain task; common interest groups has individuals with an interest in common; and friendship groups bring together people that share similar characteristics. Group definitions reveal the importance of empiric studies that try to understand the interactions, relationships, interactivity and the member's behavior in searching common goals.

2.1 Group behavior and the social network

According to Robbins (2005)'s behavior model (see Figure 1), the understanding of a group behavior means seeing it as a part of a system. In other words, it means the need to clarify external conditions in which that group is being submitted in its organization.

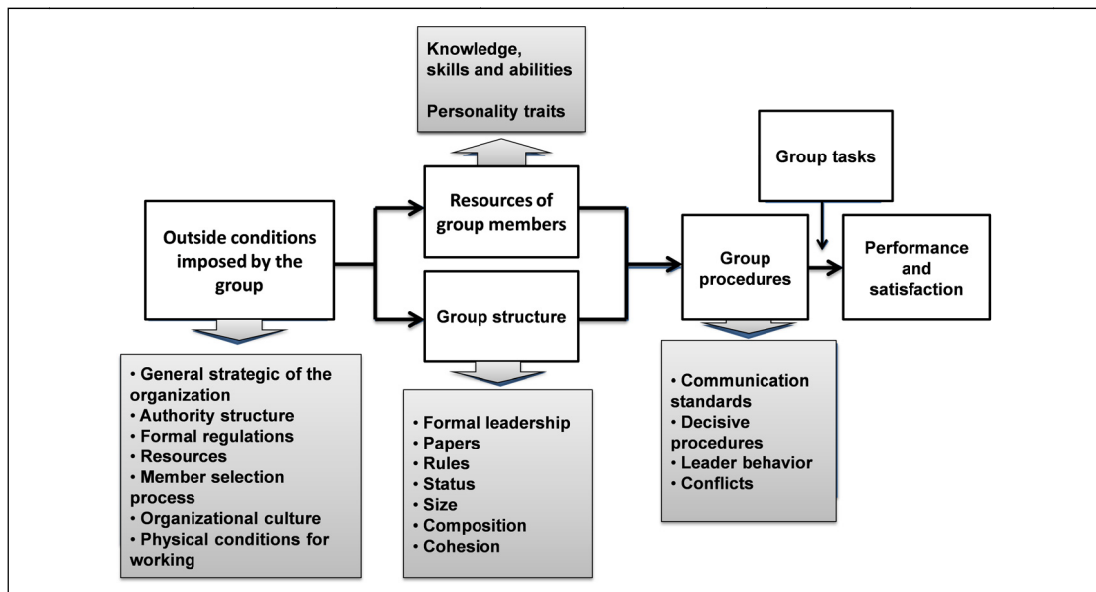


Figure 1. Group Behavior Model

Source: Adapted from Robbins (2005).

Besides external factors, it is important to observe the group members' characteristics. This is because the group's performance potential level depends mostly on the resources brought individually by its members (ROBBINS, 2005). Among the resources, the author highlights: (i), the ability to handle conflicts; and (ii), the personality traits which individually may not interfere that much, but, together, bring greater consequences to the group.

According to Albuquerque and Puente-Palacios (2004, p. 360), groups and individuals influence each other in a way that "they build and change themselves mutually so that the change generates a corresponding change in the other". The group structure molds its members' behavior.

The roles determine behavior patterns expected according to the position occupied in a social unit (ROBBINS, 2005), and they can interfere with the group results because people embrace behavior patterns influenced by their understanding regarding the role they must play. Soto (2005) divides the roles into: (i), task; (ii), maintenance; and (iii), individual roles. Task roles consist in the tasks or goals accomplishment; maintenance roles help maintaining and raising group performance; and individual roles favors individual needs before group needs and they can be dysfunctional and destructive.

Group rules, in their turn, can be central or peripheral and, according to Bowditch and Buono (1997), they represent common ideas or patterns that guide people's behavior in the groups, and they may represent written codes of conduct or non-written rules, their nature is more express than implied.

Bowditch and Buono (1997) observe that the concept of status comes from a social comparison regarding the level of a person's position in a group or a group's position in an organization.

The concept of role is related to the several behaviors people expect from an individual or from a group in a certain situation. Expectations regarding behaviors are influenced by status, status activities and by social interaction standards that determine the acceptable behaviors.

According to Robbins (2005), a group size is capable to impact its performance. There is evidence that smaller groups are faster in doing tasks. Wagner and Hollenback (1999) relate productivity with group size and highlight the inverse relation between those two dimensions. According to them, as the group grows, its productivity drops, and group members experience something called process loss (difference between what the group really accomplishes and what it could accomplish).

Group demography, according to Robbins (2005), includes characteristics such as gender, age, educational level, amongst others.

Cohesion is considered a powerful factor for the group's performance. It is about the member's desire level to remain in the group, plus the strength of their commitment to the group's goals (BOWDITCH; BUONO, 1997). According to these authors, cohesive groups tend to have stronger rules and their members reflect feelings of intimacy, manifested through opinions, actions, preferences, performance and similar behaviors. In addition, they deal harshly with dissidents. According to Wagner and Hollenback (1999), cohesion can be measured by the group's unity level and it can be stimulated by several factors, such as: actions, shared personal interests and values; agreements regarding the group's goals; frequent interactions; small group size; group rewards; favorable evaluation; external threat and group isolation in relation to other groups.

Group thinking comes from the group's excessive cohesion process, which may impair the group's ability to make decisions. In this sense, the supremacy of a very homogeneous thought may banish divergent opinions (BOWDITCH; BUONO, 1997). In these cases, the leaders have to know the group thinking symptoms and encourage group members to freely express their ideas or comments and warn them about the dangers of that behavior. These same authors argue that when interacting or making group decisions, the risk level change phenomenon may happen when the group takes a more conservative or more aggressive position, and a position of greater risk than any of its individual members.

Group tasks, according to Wagner and Hollenbeck (1999), can be simple or complex. The simple ones demand physical effort, little mental effort and little communication between the members. Complex tasks, in their turn, demand more mental effort, less physical effort, and considerable communication effort.

These same authors add that a group can be considered effective when it follows three criteria: *(i)*, productiveness; *(ii)*, member satisfaction; and *(iii)*, ability to ongoing cooperation. The productiveness efficacy suggests that the group must meet or overcome the quantity and quality standards defined by the organization. The members' satisfaction happens when group membership provides people with satisfaction in the short term, as it eases its growth

and development in the long term. The ability to ongoing cooperation, in its turn, happens when interpersonal processes, which are used by the group to complete a task, maintain or increase the member's ability to work together.

One of the well-explored behavioral aspects on the group approaches is the leadership context. With regard to it, Albuquerque and Puente-Palacios (2004) highlight the everyday aspect and the power relations that may happen on a daily basis, in which the practice of leadership is expressed also by those without positions or institutional support. In their opinion, leadership is the result of an interactive process between people, and it is a group phenomenon that does not exist in a decontextualized way. Therefore, leadership practice is the process or way to handle people, the ability to face challenges or to take risks to defend the group's interests and achieve goals.

At last, Soto (2005) highlights the groups' structural settings, or communications network, here represented by the social network. The network represents the relatively permanent communication process between those who play the roles in the groups and may contribute to keep them united. The author highlights five types of structural settings: (i), radial; (ii), "Y"; (iii), chained or locked; (iv), circle; and (v), fully connected. Explanations for each one are given in Table 1.

Table 1. Groups' structural settings and their characteristics

Type	Explanation
<i>Radial</i>	One person communicates with all the other work group members
<i>Y</i>	Hierarchy. One group member acts as the central element
<i>Chained or Locked</i>	Hierarchy. One member only communicates with the other two members adjacent to him/her
<i>Circle</i>	Everyone is capable of sending and receiving messages. Each member can communicate with the other two members
<i>Fully connected</i>	Everyone communicate and share information with each other

Source: Adapted from Wagner and Hollenbeck (1999) and Soto (2005)

Wagner and Hollenbeck (1999) argue that communications networks may be analyzed in the following aspects: information transmission speed; information transmission precision; saturation, that is high when information is divided in a uniform way; and members' satisfaction about the communication process and about the members in general. On the other hand, Soto (2005) divides the analysis process in information exchange characteristics and members' characteristics. Combining these two author's perceptions, the communications network analysis criteria are summarized in Table 2, according to each factor and network type.

Table 2. Communications network analysis criteria and their characteristics

Radial	Y	Chained or Locked	Circular	Fully Connected
<i>Information exchange characteristics</i>				
SPEED				
High -----		Simple tasks		----- Low
Low -----		Complex tasks		----- High
ACCURACY				
High -----		Simple tasks		----- Low
Low -----		Complex tasks		----- High
Low -----		SATURATION		----- High
<i>Member characteristics</i>				
Low -----		SATISFACTION		----- High

Source: Adapted from Wagner and Hollenbeck (1999) and Soto (2005).

Saturation is defined by Soto (2005) as the number of information that is transferred to the network's sectors. And, according to Wagner and Hollenbeck (1999), both group members' saturation and satisfaction are usually higher in decentralized networks, as everyone is informed and fully involved in the process and in the communication task. Soto (2005) observes that task complexity does not seem to affect the groups' saturation or satisfaction.

Antonacopoulou and Chiva (2007) bring another way for looking into the structure issue, called scheme/diversity. They suggest that social systems have subjacent structures, which allow them to coordinate their diversity of agents. The authors also argue that the "scheme" term is more suitable for it, as it brings the idea of flexibility, instead of bringing the idea of rigidity (in which is normally associated to the notion of structure). The schemes created by the social actors' interactive relationship provide a reference framework that allows them to anticipate the results of their actions. In this way, agents differ from each other, and their performance depends on the other agents and on the social system, which influences behavior, giving the context an essential role in defining the agents' actions. Interdependency and heterogeneity, together with diversity, make the system viable, as they offer it: (i), the ability to renew itself; and (ii), the social conditions that allow it to work properly.

3. Research Design

The methodological strategy used in this theoretical-empirical research was the in-depth case study in the way suggested by Yin (1994). The unit of analysis (Yin, 1994) chosen was the Santa Maria River Hydrographical Basin Management Committee. It is one of the Hydrographical Basin Management Committees from the state of Rio Grande do Sul, (South of Brazil). Target audience was made up of 47 members, formally established as the

Committee's effective and/or alternate representatives for the two-year period of 2006/2008 and 2008/2010.

Group interaction analysis was made by using analytical tool to study group interactions, called Sociometry. It aims to map the social network or to analyze the organizational network. Sociometry's conceptual framework was established in the 1950s. Terminology and scientific dissemination are linked to the name of Jacob L. Moreno, pointed out as the great responsible for systematizing and creating their basic concepts (Alves, 1964). Alves (1964, p. 6) puts together the opinions of several authors about the following Sociometry concept: "Psychosocial phenomena analysis by applying quantitative methods, in order to reach all interpersonal relationships in its process".

Robbins (2005) highlights that from mapping preferential interactions, obtained from questionnaires and interviews it is possible to organize a sociogram of a particular group. The terms used in this study for analyzing the sociogram are summarized in Table 3.

Table 3. Terminology of a sociogram

Term	Explanation
<i>Social networks</i>	Specific set of connections between a certain group of people
<i>Clusters</i>	Groups that exist within the social networks
<i>Prescribed clusters</i>	Formal groups, such as departments, work teams, task forces, crews or committees
<i>Emerging clusters</i>	Informal and non official groups
<i>Alliances</i>	Clusters of individuals that come together temporarily to achieve a specific goal
<i>Cliques</i>	Informal groups relatively permanent, which involve friendships
<i>Stars</i>	Subjects with the highest number of connections within the network
<i>Bridge</i>	Subjects that act as a connecting element since they belong to two or more clusters
<i>Isolated</i>	Subjects that are not connected to the social network

Source: Robbins (2002, p. 215).

A Sociometric test was applied according to Alves (1964, p. 16)'s directions, in order to gather data regarding each group member's "projection" to the other members, mapping the preferences that each respondent has about the other Committee members when making choices about professional and social interaction. Therefore, the applied test can be classified as "the sociometric test itself".

The method of choice, suggested by the survey respondents, was classified as ordinal, and from a list with Committee members' names, each one of them made their choices, listing

them in order of preference (Alves, 1964). Sociometric criteria identified work groups (preference for professional interaction) and affective groups (preference for social interaction), and questions were asked, respectively, in the following way: *Which individuals (Committee members) would you rather work with?*

Even though the procedure was about identifying preferences, and not rejections (Alves, 1964), the subject names mentioned were encoded after the choosing procedure in order to preserve the correspondents' identities.

The process of analysis included primarily raising frequency statistics data, which made possible to identify the most mentioned individuals on the first, second, third, fourth and fifth choice. This procedure allowed us to identify individuals with group's preference for professional interaction. The chosen ones were classified according to the rule defined from theoretical reference such as: stars, strong and average emerging leaders, peripheral leaders, potential isolated and isolated; and taking the number of mentions received from other members into consideration. After categorizing, the procedure of network building began, in which members were classified according to standards shown in Table 4.

Table 4. Pattern and classification of group leaders and individuals

Number of mentions	Pattern	Classification
16	●	Star
11	●	Strong emerging leader
10		
9		
7	○	Average emerging leader
5		
4		
3	⊙	Peripheral emerging leader
2		
1	○	Potential isolated
0	⊙	Isolated

Another pattern was used to distinguish members' relationships emerging clusters: cluster A, cluster B, and cluster C.

At last, it is important to say that the sociometric test was applied on this study because the correspondents knew each other. This was an essential condition to them for making the choices.

The development of this study also relied on the notes from the Committee's meetings and on following public hearings of *FEPAM* (Environmental Protection State Foundation Henrique Luis Roessler).

Meetings were watched *in loco* (Marconi & Lakatos, 2007) using a monitoring script, trying to understand the committee's work dynamics process and rules, as well as its members' actions. Eight Committee regular meetings; one *CPA* (Permanent Advisory Commission)

meeting; one entity election meeting; one tenure and board election meeting; one meeting to prepare for public hearings; and two public hearings were followed from August 2007 till October 2008.

According to Markoni and Lakatos (2007), the meeting's observational methods were classified as unsystematic, non-participating, individual and real observation. This observation process classification is due to its informal, simple and free characteristics when trying to raise and record facts without using special technical means or direct questions, playing the observer role and collecting data straight from the actual environment in which the meetings took place.

Meetings and public hearings were reported in meeting reports (Hair *et al.*, 2006) and their information was placed in the analysis context.

The meeting's target audience was made up of Committee members and leaders, government representatives and local community members. Each meeting had an average of 40 people, and in some meetings more than 50 people were accounted for.

FEPAM public hearings were watched *in loco* by the researchers. These meetings aimed to make public and to discuss with the community the *EIA/RIMA* studies of Taquarembó and Jaguari dykes. There were 509 people present in the Dom Pedrito's local meeting and 620 people present in the Rosário do Sul's local meeting. Members of the local communities and any locals interested in sharing thoughts on the matter attended the hearing.

4. Social Network, Settings and Group Behavior Regarding Santa Maria's Committee

This section aims to show the observation and sociometric analysis results and to highlight the group behavior aspects. It is important to mention that the source of this information is in the respondents' perception and not in analyzing the organization communication process, because analysis would demand an organizational communication study and also it would demand other analysis sources and instruments, what is not the purpose of this study.

Characteristics of the role played by members allow us to say that group tasks are complex, since they demand more mental effort, less physical effort and considerable communication effort (Wagner & Hollenbeck, 1999). Central rules are formally established in Internal Regulations (*RI*) and there are non-written peripheral rules (Bowditch & Buono, 1997) that guide the groups' actions, as noted on following up the meetings.

We noticed behavior patterns as a result of non-written rules, but they explain conduct, such as sequence of procedures during the meetings, starting from reading the minutes, permission to talk, cordiality and respect to other people's opinions, the right to respond, holding meetings in the afternoon in order to allow more members to attend the meetings, amongst others.

4.1 Social network and emerging clusters using professional interaction criteria

Social network mapping (emerging clusters) (Robbins, 2005), by professional choice criteria, has been presented and discussed in this section. The limits of emerging clusters were used as a teaching resource to follow the social network development from 1st to 5th professional

choice. In this sense, all of the following analyses show how the group was arranged to face the inter-municipal barriers and to develop group cohesion. The color pattern was the background to visualize how interactions, from 2nd choice on, had contributed for the establishment of that cohesion.

Figure 2 shows social network standards established by the respondents' 1st choice. The first pattern allows us to see five clusters organized around X1, X2, X3, X4 and X5 leaderships. These clusters cannot be considered as prescribed clusters because they do not represent any department, commission or work group formally set up by the organization. Therefore, they are called emerging clusters and they are informal and non official subgroups (Robbins, 2005).

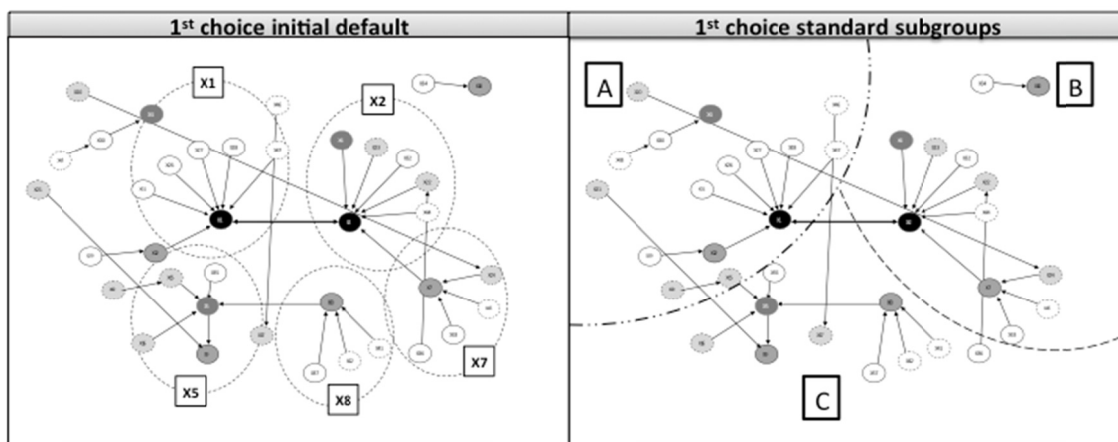


Figure 2. Social network standards established by the respondents' 1st choice

On Figure 2 we can also see three big emerging clusters known as A, B and C. Emerging cluster A has members from 3 municipalities, emerging cluster B has members from a single municipality, and emerging cluster C has members from 2 other municipalities. Clusters A and B are connected by a reciprocal relationship between two central leaders, what is essential to maintain group cohesion. These 2 elements connect (Robbins, 2005) the members from 2 municipalities who have stood out along the history of the Committee (see Figure 2). Some members had mentioned that these are also the 2 municipalities that are most interesting to the Committee. That is why these two clusters are considered strategic to the organization.

On figure 3 we can see, from 2nd choice on, that cluster pattern seen on 1st choice (Figure 2) was gradually giving way to a social network, the structural setting of which looks like a fully connected structure (Soto, 2005). In this type of setting, as highlighted by Wagner and Hollenbeck (1999), it is possible for all members to talk to each other and to share information between them, which suggests the existence of a communication process between those who may contribute for keeping the group together (Soto, 2005).

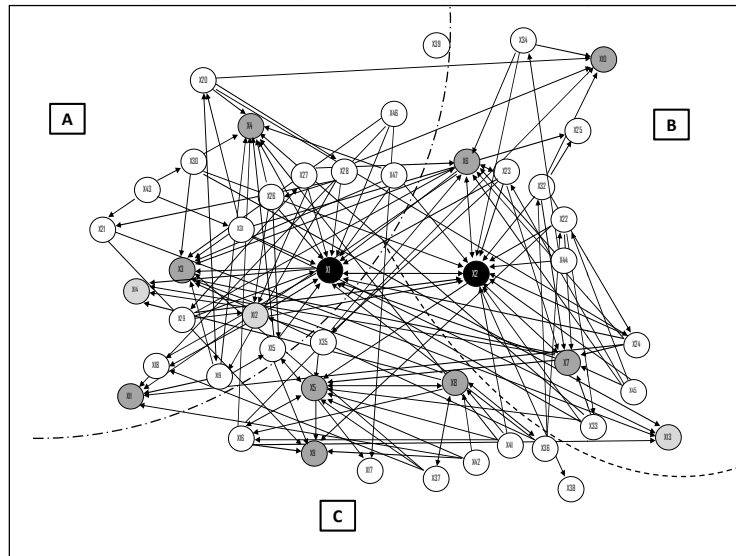


Figure 3. Social network development by 1st to 5th choice professional criteria

Committee interaction, amongst other ways, may occur through an email network, common to all members, including authorities of all decision-making levels and administration system authorities. Email network eases communication between members, who can exchange information about topics discussed at the Committee and receive information about meeting results and about activities carried out in their communities in the between meetings period.

However, it is important to highlight that, despite the possibility of interaction between all members, it was observed that this potential of the information and communication network is not fully exploited, leaving the task of getting more information to the executive secretary. Regarding information exchange and communication patterns, the system looks like the radial communications model (Soto, 2005), in which prevails the information exchange between individuals.

Theoretical reference points that when tasks are complex, as Committee tasks are, the total connection between members is a facilitator factor for exchanging information, because not only communication speed is high but also the information that arrives to those involved is precise. The satisfaction stands out as the members' first characteristic in this kind of network. This is because everyone is informed and fully involved in the process and in the communication task. The fact that everyone is informed and involved in the process also prevents information overload on network central points, as it may happen in centralized networks.

This finding suggests that there is a potential to be explored by the Committee, i.e., there is a potential to level and to provide better information as well as integrate isolated and potential isolated members.

Another way of interaction between members is a "meeting circuit" between cities that belong to the Basin of Santa Maria River. This process is impaired by the Committee's lack of resources resulting in holding the meetings at the main municipality.

4.2 Exploring the emerging leaders' role and group behavior

The following analysis investigates the group's behavior and its connection with emerging leaders chosen by the members. On Figure 4 we can see an overview of these leaders with focus on the star ones. One can see that people who were most chosen by the members, which are called emerging leaders, are geographically distributed in the Committee. It is possible to notice that there are six emerging leaders in cluster A, five in cluster B, and three emerging leaders in cluster C.

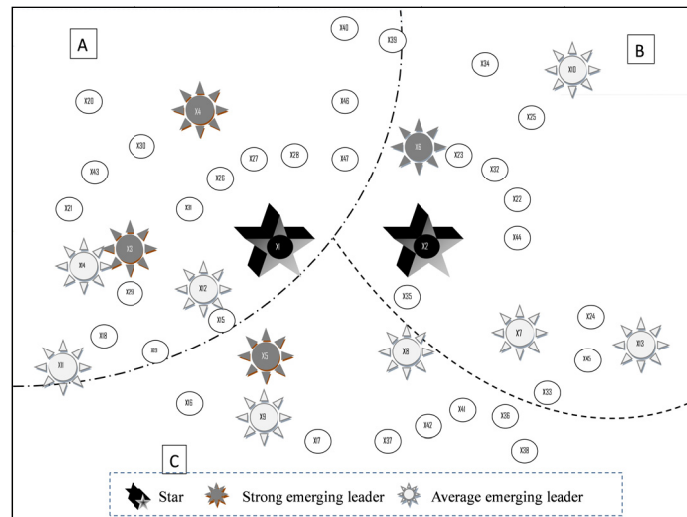


Figure 4. Geographical distribution of emerging leaders

On Figure 5 we can notice the group members' status. At first, the results are very positive. Only 15% of the 47 people mentioned in the professional criteria classified themselves as isolated. The remaining 85% were mentioned at least once. However, a closer look can help identifying aspects that can be improved or enhanced by the Committee leaders. The following analysis points out some of these aspects.

Also on Figure 5 we can see that 5% of the individuals mentioned were classified as stars (Robbins, 2005), and they were those with more connections within the network. It is noticeable that on the non-isolated subgroup, 34% were classified as emerging leaders and 9% were classified as strong emerging leaders (9 out of 11 mentions) and 20% were average emerging leaders (4 out of 7 mentions). Other 28% were classified as peripheral leaders as they had received less than 4 mentions. The potential isolated percentage was 38%.

Number of mentions	fr	%	Number of mentions	fr	%	fr	%	Classification
1 a 3	26	66	1	15	38	15	38	Potential isolated
			2	7	18	11	28	Average emerging leader
			3	4	10			
4 or more	14	34	4	3	8	8	20	Average emerging leader
			5	4	10			
			7	1	2			
			9	1	2	4	9	Strong emerging leader
			10	2	5			
			11	1	2			
						16	2	5
Total	40	100						

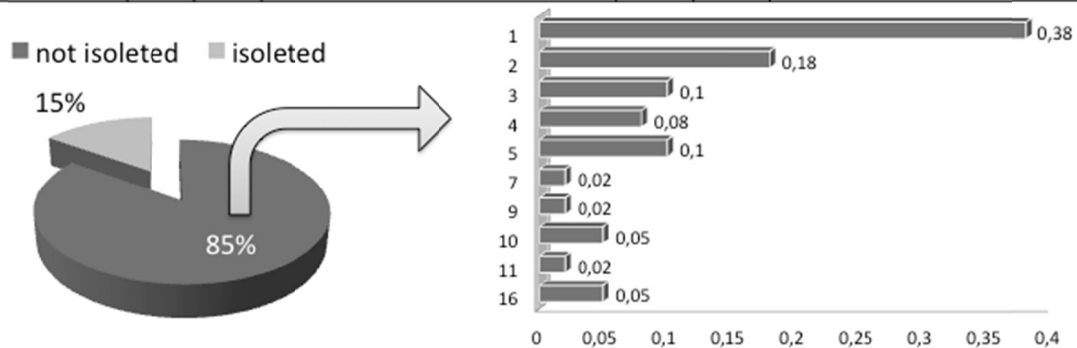


Figure 5. Member status

On Figure 6 there is a complement to this analysis in which we can see that the stars of the group already emerged as leaders from the 1st choice in the professional criteria, and they keep being mentioned until the 5th choice.

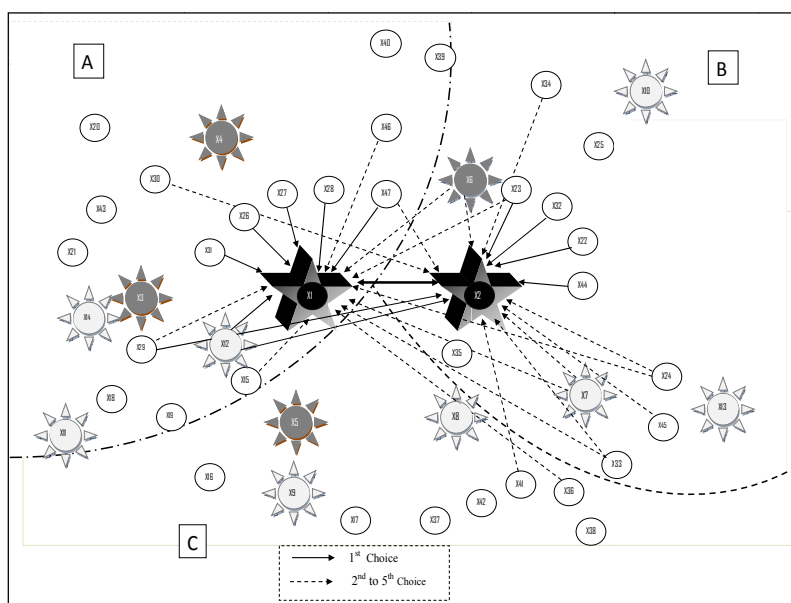


Figure 6. Stars by professional choice criteria

The fact that these two leaders were chosen by members of the three clusters (A, B and C), and that they belong to clusters A and B, respectively, which were already mentioned as strategic for the action of the Committee, should be carefully considered. They are both part of the Committee's formal leadership. It gives this choice a greater importance by reinforcing the acknowledgement of this leadership, and the attestation of this leadership by some group members.

Besides the attested power granted to these leaders by the organization through voting process, results suggest that individuals classified as stars also have another kind of power that is like reference or charisma power (i.e., a personal power based on personal magnetism or charisma). This kind of power can combine referral with knowledge, creating conditions to influence people, since not only personal referral but also knowledge result in credibility by the ones under their leadership. This result has great strategic potential for the Committee, especially if the effects and agreements of the ones under their leadership are combined with the practice of the attested and reference power.

The two leaderships were reciprocal in their choice, which reinforces their strategic role and makes them the link (Robbins, 2005) between clusters A and B. The Committee's formal leadership, however, is capable of linking these two clusters that are essential to the equalization of the main conflicts and disputes that canalize the main decisions regarding the Basin water use. Scarcity period enhances disputes, as the urban water supply in the cluster C main city is, primarily, one of the main pressures on the system. When scarcity happens, the system needs to reorganize itself in order to respond properly to the water demand.

Not only may this setting promote unity and agreement between these two clusters (A and B), but also may be conclusive for disintegrating the group, in the hypothesis of rupture between those two links. These issues strengthen even more the strategic roles of the stars to the organization. Cohesion is mentioned as a determinant of group performance (Bowditch & Buono, 1997), and it is also necessary for maintaining the group together when facing outside threats (Wagner & Hollenbeck, 1999), which is crucial to achieve its main objectives and goals.

Santa Maria's leadership has the leadership concept reported by Albuquerque and Puente-Palacios (2004), as Committee leaders practice not only formal leadership, but also practice leadership in everyday life, in the same way that several members do, who were considered emerging leaders by the choice of their peers.

The leadership group demography shows there is a prevalence of members from the Rosário do Sul (8) and Dom Pedrito (9) municipalities, members with a degree in Agronomy (10) and group of water users (13). These members' knowledge and experience can be translated into the group's general set of skills.

We could notice that people included in that group were actively engaged in the debates, actions and decision-making, influencing not only the decision-making moment, but also the actions that follow those decisions. The precarious granting process, that had active interference of one of those leaders, is an example of that. Another example was the obtainment of resources from the Rio Grande do Sul State Water Resource Fund in which

was defended before the others State Committees and that had effective participation and defense by one of those leaders together with the Committee's Chairmanship.

When reviewing the isolated and potential isolated, one can notice that they are primarily distributed on cluster A (see Figure 4) in which has eight potential isolated and also three isolated members. On cluster B there are four potential isolated and two isolated members. On cluster C there are three potential isolated and two isolated members.

Although most of the isolated or potential isolated members have a college degree (14 of them), there are seven of them who are only graduated from high school. When comparing to the emerging leaders subgroup, one can see that there are 18 people with a college degree versus two people who are graduated from high school. It is noteworthy that on the isolated and potential isolated subgroups, there are four members with a graduate degree versus none in the leader subgroup. That subgroup formation is much more diversified than the one in the emerging leader subgroup.

Regarding the Committee group, there is a certain balance between users (11) and the population (10). In the leader subgroup it was a 13:7 ratio.

The duration of the participation in the Committee is also one of the factors that differs the two groups. Regarding the isolated or potential isolated members, even if there is a prevalence of members that have been in the Committee for 4 years or longer (10); there are five members staying between 3 and 4 years; two members staying between 2 and less than 3 years; and three members staying for less than 2 years. This does not happen with leaderships in which most of the people have been in the Committee for 5 years or longer.

The differences established suggest that emerging leaders are individuals who come from two major local municipalities, integrated to the agrarian cause that is defended by the Committee and committed to the group of users. In addition, it is noteworthy that their education level is higher than local standards and that they have been working in the Committee for more than one third of its existence.

It is important to highlight that isolated and potential isolated members have more diversified education and qualification. It can be an important issue as they are both present in the two main Committee groups (users and the population) and the other Basin municipalities. Most of those people have not been in the Committee for a long time. New members stimulate self-organization and they help strengthening diversity in the Committee, which is important to develop their exploring and learning abilities. Their integration within the group is an important factor to avoid group thinking, which is an excessive cohesion process of the group that may even impair their ability to make decisions. This reflects the thoughts of Antonacopolou and Chiva (2007) and their argument on scheme/diversity.

Leadership dynamics (see Figure 7), allows us to see that leaders alternate amongst clusters A, B and C, throughout a dynamic process in which indicates mobility, changes and adaptability of the system. Besides moving between several clusters, in some cases, these leaders may connect two or even three clusters, as well as they represent the link between isolated and potential isolated members with the rest of the group. This network enables the emergence of the learning process (Casey, 2005).

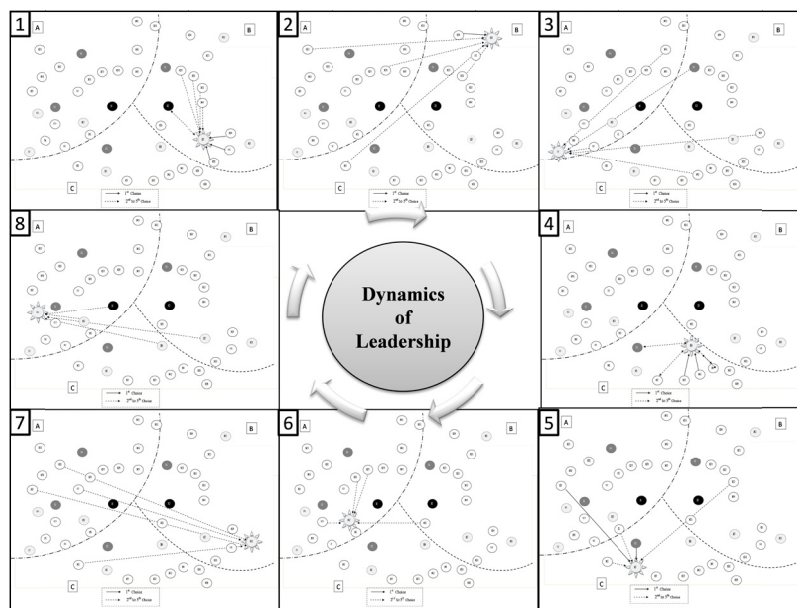


Figure 7. Emerging leaders dynamics

The existence of this social network (informal setting) supplements the Committee's formal organization, and it is worthy of equal merit assessment by its leaders. This structural setting may contain one of the great distinctive factors for the committee operation.

The commitment of local communities is another aspect that can be stimulated by the strategic use of leadership in the process of sharing responsibilities. It can be expanded into all Basin area as leadership geographical distribution has become evident. It can enhance the decentralization process recommended by the system.

Strategic use of these leaders may also contribute to connect isolated with potential isolated members. It is up to them to keep the group united, to create and maintain strong relationships, and also to encourage others, promote harmony and to define group standards.

5. Final considerations

Sociometric analysis revealed the existence of a fully connected social network among the members when submitted to professional choice criteria. It was possible to identify the status of members classified as emerging leaders and also the isolated ones.

The group has a structural setting organized in three clusters that reproduce the geographical structure of the Committee municipalities.

The connection between members of different clusters, as well as reciprocal choices between the two star leaders, ensures group cohesion and gives strategic importance to its current setting. The role of these leaders as facilitators became evident and the dependence of group cohesion in relation to them was noteworthy as well. In the hypothesis of rupture between those two members, who are also formal group leaders, cohesion will be compromised.

The importance of informal organization structure (clusters) and dynamics of emerging leaders was highlighted on this study, as well as the capability to the better use of the

emerging leader experience in connecting isolated subjects with potential isolated ones. It also became evident that in the isolated and potential isolated groups there are people who can foster and renew the organization.

At last, it is important to mention that interdependency and heterogeneity, along with diversity, make the system viable since they provide it the ability to renew itself as well as the social conditions that allows it to function properly.

It is worthy pointing that this study gives a chance to developing new studies which may bring emerging topics such as social learning, conflict of interests in the group, diversity, power, leadership or even other network mapping ways (e.g., using the social choice criteria).

These studies may contribute to the assessment of these settings against management theories, which shall contribute for their development in the future, because it was clear that conducting research in these environments is more related to technical than behavior issues.

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