AN ASSESSMENT OF THE INFLUENCE OF GROUP CHARACTERISTICS ON CAPACITY-BUILDING FOR LOCAL ENVIRONMENTAL ACTON IN BRAZIL

By

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To all brave people involved with the education for environmental management in Brazil, especially those involved with the Projeto Pólen

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LIST OF ABBREVIATIONS

CONAMA	Conselho Nacional de Meio Ambiente (Brazilian National Environmental Council)
IBAMA	Instituto Brasileiro do Meio Ambiente e Recursos Renováveis (Federal Environmental Agency)
TCA	Technical Cooperation Agreement
UFRJ	Universidade Federal do Rio de Janeiro (Federal University of Rio de Janeiro)
RESEX	Reserva Extrativista (Extrative Reserve)

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The formation of groups has been examined as a strategy to build social capital and improve environmental management and civic participation. In this study, I assessed characteristics of thirteen groups composed of public government workers and civil society representatives, which were formed by an educational program within the scope of the Brazilian licensing process of oil and gas activities. I interviewed group members and measured group success to test a model of group maturity, in which maturity is associated with program success. Variables in the model include internal norms and rules, group lifespan, external links, and defined objectives. I tested for associations between maturity scores and project plan evaluation scores, number of self-initiated activities and success rated by the external agency. The results did not statistically support the hypothesis that more mature groups developed better project plans; however, more mature groups conducted more self-initiated activities and were ranked more successful by the external agency. Results suggest that group maturity is associated with successful activities. Differences in groups' internal norms and rules accounted for changes in the external agency score. I suggest that the model additionally should include temporal measurements of each variable, in order to make a

more accurate assessment of group characteristics. I discuss how organizational characteristics of groups as well as their external context influence the type of social capital formed, and thus its outcomes. I provide recommendations to improve educational projects in this public policy context. These include involving people with previous abilities or experiences similar to project tasks; providing capacity building for all participants, providing groups with continuous tasks, stimulating empowerment evaluation, providing support throughout the project life cycle, and increasing dialogue among the multi-scale institutions involved in the project.

CHAPTER 1
INTRODUCTION

Researchers are increasingly examining participatory approaches and the use of social capital in the promotion of civic participation (Edwards & Foley 1997; Thorp, Steward & Heyer, 2005). Undoubtedly, local collective actions and institutional designs that allow civic participation in national policies and programs are important to strengthen democracy. However, the success of group action also depends on the objectives of the organization, its internal structure, and the motivation of the participants (Eastis, 1998). Yet, few studies have investigated the influence of the internal characteristics of groups on their outcomes (Edwards & Foley, 1997).

The Brazilian Constitution of 1988 and subsequent environmental laws guarantee a role for civil society to participate in public environmental management. However, the process of legitimizing these roles is still under development, and efforts to build capacity among civil society to access these roles are extremely important in this process (Loureiro, 2009). Effective participation in environmental management requires that participants understand the context in which decisions are made regarding the use and transformation of natural resources, the risks and consequences of the decisions, the environmental agency structure, and the relevant legislation (Loureiro, 2009; Quintas, 2006).

In this study, I analyzed an environmental education project developed under the licensing process of oil and gas activities in the northern coast of Rio de Janeiro State. The Pólen Project is an initiative that offered capacity building to public workers and representatives of civil society organizations of 13 municipalities affected by two development projects of Petrobras, a Brazilian energy company. A capacity building

program helped form and develop 13 groups composed of local government and civil society members. The group participants have designed and now are implementing their own projects to mitigate socio-environmental impacts of oil and gas activities. Each group selected activities for their municipality within a two year period. The Pólen Project has been recognized by the Federal Environmental Agency (IBAMA) as an exemplary experience of education for public environmental management of the oil and gas licensing process in Brazil. It will be used as a model to be replicated in other areas of oil and gas exploration.

In this thesis, I explore the organizational characteristics of the 13 groups formed in the Pólen Project Context, using a model of group maturity, which analyzes group worldview, internal norms and rules, external links, and lifespan, to comprehend what factors are influencing the groups' performance (Pretty & Ward, 2001). I aimed to understand how these factors influence group dynamics and success in order to make recommendations to the external agency, a group at the Federal University of Rio de Janeiro, as well as to IBAMA. This study should help in the development of environmental education programs aiming to increase public participation in the public policies of the oil and gas licensing process.

1.1 The Brazilian Environmental Licensing Process

The Brazilian Constitution from 1988 establishes that the protection of natural resources and environment is a responsibility of the government as well as citizens. However, the appropriation and sharing of natural resources is complex, involving different stakeholders and interests, and often marked by conflicting interests. The government is assigned the role to mediate conflicts and confront interests through public environmental management, although the government itself may not be a neutral

stakeholder (Quintas, 2006). The Brazilian government, due to its social, political and cultural history is marked by a dominance of private interests, which have been favoring economic elites over the majority of the population. In this context, it is important to ensure the participation of other civil society groups to assure a more transparent and fair decision-making process (Quintas, 2006).

The licensing process for environmentally threatening activities in Brazil is a process determined by the National Environmental Council –CONAMA - (CONAMA 1997), which requires the federal environmental agency (IBAMA) to set the standards the companies must follow in order to be allowed to explore for natural resources. During this process the company must make an environmental impact assessment (EIA) and report (RIMA), in order to identify the impacts of the development as well as to develop compensatory and mitigatory actions, and to divulge the information collected (CONAMA, 1986). The RIMA thus is submitted to the public, and during public meetings, people can make suggestions to the proposal, which may be accepted by the technicians directly responsible for the process (CONAMA, 1987; Serrão, Walter & Vicente, 2009).

These participatory discussions are recognized as having a strong potential to deepen democracy, combat corruption, and generate redistributive policies that can reduce social inequalities (Avritzer, 2009; Dagnino, 2002b). This potential to deepen democracy is born in the recognition of the complexity of processes and contexts, and in the multiple relationships between political forces (Dagnino, 2002b). Many social movements and environmental organizations have been fighting for a more participatory

licensing process, but many obstacles are undermining the democratization of these issues.

For instance, with the globalization of the economy, processes happening in a local context respond to demands on a national and global scale (Piquet, 2007). The shift from a regional demand to a national and/or international one disconnects the social, economic and environmental conditions of the region under exploration, reducing the benefits to the local and regional scale (Piquet, 2007). The environmental impact assessment (EIA) and report (RIMA) should identify the impacts of the development as well as set the compensatory and mitigatory actions. However, these reports are developed by institutions contracted by the company responsible for the development, and give more emphasis to the environmental rather than the social aspect of the development, using specific technical knowledge and language, without inputs from the affected local groups (Glasson & Salvador, 2000).

The information about the development itself is often not well publicized, thus people do not know about the RIMA or when the public meetings will occur. Commonly, local groups don't know what such a public meeting (instrument of the law to obtain public inputs to the process) is and how to participate. In addition, the asymmetry of power between the national and international economic forces willing to explore for natural resources, and the local groups directly affected, aggravated by the lack of resources and skilled government personnel to mediate conflicts, unbalance the process to favor the most powerful groups (Uema, 2009; Dagnino, 2002a).

The legislation regarding the licensing process began with the Brazilian Constitution of 1988, and received more detailed description through the National

Environmental Policy (Brasil, 1981), the Law of Environmental Crimes (Brasil, 1998), and a group of resolutions made by CONAMA. The legislation for oil and gas specifically started in 2000, when the oil law (Brasil, 2000) was created in response to two large oil spills in the Rio de Janeiro and Pará states. It also was concomitant with the breakdown of the monopoly of oil exploration in Brazil and the creation of the National Petroleum Agency (ANP) (Loureiro, 2009).

The impacts of oil and gas activities are social and environmental, positive and negative. The Brazilian legislation defines environmental impact as any alteration in the physical, chemical and biological properties of the environment caused by materials and/or energy resulting from the human activities that directly or indirectly affect the health, security and wellbeing of the population, the social and economic activities, the biota, and the aesthetic value and quality of the natural resources (CONAMA, 1986).

The impacts of oil and gas activities include changes in the municipality population structure, territory organization, the political process, local culture, and municipal budget from inputs of royalty money, as well as environmental impacts (Piquet, 2007). Research on local people's perception of impacts of oil and gas activities (Marsico, 2008), identifies that the most perceived impacts are environmental (oil spill, pollution, environmental degradation), an increase in the municipality population size (migration), creation of jobs, and the corporate social responsibility programs. Many indirect impacts are perceived by the local population as having an important impact on the municipality.

1.2 Environmental Education for Public Environmental Management

In 1999, the National Environmental Education Policy (Law 9795/1999) was created and mandated a legal obligation to include environmental education as a required action to obtain environmental licenses (Loureiro & Anello, 2009). The

objectives of inserting this educational component in the mitigation process are to guarantee public awareness of licensing processes, to build knowledge that allows responsible and qualified positioning of involved stakeholders, and to broaden the participation and mobilization of affected groups in all phases of the licensing process including public participatory meetings and other public venues (Loureiro, 2009). The law is valid for all types of economic activities potentially threatening to the environment; however, only the oil and gas licensing sector has implemented the educational component, and in 2005 specific guidelines were developed for planning and implementation of these programs (IBAMA, 2005).

The law states that these environmental education guidelines should affirm the role of civil society organizations in the management of natural resources, making use of an interdisciplinary, democratic and participatory approach (Brasil, 1999). The educational process should be continuous and should stimulate a critical analysis of the environmental and social problems by the participants (IBAMA, 2005).

The education process for public environmental management was created in 1995, within the governmental sector, by two educators of the defunct Environmental Education Division of IBAMA, José Quintas and Maria José Gualda (Layrargues, 2000). The authors state as premises of the public environmental management process the following aspects:

- In this context, environmental education should create conditions The access and use of natural resources causes conflicts.
- Different stakeholders have different power to transform the environment, and to influence the decision making regarding the transformation.
- Environmental management is a process of conflict mediation, and decisions dictate who is going to receive benefits and who is going to incur costs from the use of natural resources.

- The asymmetry in the distribution of benefits and costs are not self-evident, and the notion of sustainability has many different meanings.
- Environmental risks and damages are not always self-evident, and are not only a cognitive issue, but also influenced by cultural, political and structural factors.
- Participation and social control under natural resources management depend on overcoming the power asymmetries.
- The collective mobilization and participation in environmental management require cognitive and material resources to be organized.

of exchange and production of knowledge, skills and attitudes that enable the participants to autonomously decide and represent their interests to transform the social and environmental conditions under which they are submitted (Loureiro, 2009).

This approach of environmental education is linked to the concept of liberation education, developed by Paulo Freire (1987), as well as education for citizenship stated in the Declaration of Tblisi (1977). It is based on a dialectic process of acquiring knowledge to modify a reality and at the same time to be modified, in which the subject must become able to contextualize the new knowledge in historical time, recognize different types of knowledge beyond the technical and scientific, and recognize participation in public life as a venue to build citizenship and to deal with the inequalities in the distribution of what is socially constructed (Freire, 1987). For this thesis, I will use the term environmental education (EE) interchangeably with what I have previously described as education for public environmental management.

The field of environmental education is still in a process of definition. It is composed of a range of different educational practices, which uses different methodologies in terms of the use of cognitive and emotional aspects, biological and social contexts, positive and negative approaches (Layrargues, 2000). One important problem is related to the lack of evaluation of environmental education initiatives, which

contributes to a lack of information regarding their areas of success and failure (Jacobson 2009), and contributes to a devaluation of these educational initiatives, impeding their institutionalization and funding (Andrade & Loureiro, 2001).

1.3 The Pólen Project Initiative

The case analyzed in this paper examines an environmental education program in the oil and gas licensing process of two platforms in the Campos Bay, northern coast of Rio de Janeiro State. The company responsible for the exploration, Petrobras, is an energy company created by the Brazilian government in 1953. Now it has a mix of national and international capital, but it operates under the jurisdiction of the Brazilian federal government, and still has the status of a national company among the populace (Piquet 2003). A group from the Federal University of Rio de Janeiro (UFRJ) is responsible for the design and implementation of the Pólen project, which started in 2006. The initiative of this group of UFRJ is also an attempt to amplify the extension work the university has done in the interior of Rio de Janeiro state, in the new campus in the region.

The project, which encompasses 13 municipalities (Table 1-1, Figure 1-1), selected public workers of the local Environmental and Educational Secretariats, as well as representatives of local civil society organizations to form groups (one per municipality). The number of participants per group was proportionally related to the size of the local population, varying from 2 to 8 participants (Projeto Pólen, 2009). In total there are 45 people, 30 from the local government and 15 from civil society (Table 1-1).

The capacity building program offered by the UFRJ to the public workers was composed of 4 workshops, each one-week long, interspersed with forums and

monitoring visits made by the UFRJ coordinators, which took a total of two years. The scope of the course was organized to include the principles of environmental education in the licensing process, the legislation related to the oil and gas licensing process, impacts and mitigatory actions, notions of participatory methodologies, project elaboration, and evaluation (Appendix A). In addition, there were short-term courses (one weekend) for representatives of local civil society organizations, in order to give them a general idea of the education for public environmental management and conflict analysis, and prepare them to work together with the government representatives. At the time of the study, one capacity-building course for the public workers and three for the representatives of the civil society were conducted.

The differences in the capacity-building courses offered characterize the emphasis of the project in increasing the capacity of public workers to work with civil society organizations and communities affected by oil and gas activities in the municipality. As a consequence, not all groups have civil society representatives among their members (Table 1-1).

In order to establish the scenario for the project development, each municipal secretariat was invited to sign a Technical Cooperation Agreement (TCA) with the UFRJ and Petrobras, in which they agree to provide eight hours per week of release time from workers normal duties, to be dedicated to the project, and to provide a physical space for the offices of the groups. Each group was equipped with a desktop computer, printer, office furniture and a small collection of books.

In October 2008, the groups started the development of their own projects related to the impact of oil and gas production in their municipalities. All groups have a budget

of $ 11,049 to implement the projects. The projects should be developed within 2 years after the IBAMA approval, and should use the principles of education for public environmental management.

One important aspect of the Pólen Project is the participation of public government workers as well as civil society representatives. Considering that the state should be the mediator of the different interests of the civil society groups, it is important that the public workers have the necessary skills to conduct mediation for environmental management, as well as to recognize the importance of civil society groups in this process (Baqueiro, 2003; Quintas, 2006; Thorp, Steward & Heyer, 2005). The lack of skills of public functionaries responsible for the participatory institutions is one of the mechanisms that blocks an effective sharing of power between the state and civil society (Dagnino, 2002b). In this sense, the project has the potential to contribute to the improvement of public workers' skills, as well as to start a partnership between them and the local civil society.

1.4 Group Formation and Social Capital Creation

Recently, the approach of collective action and group formation has received worldwide attention with the popularization of the social capital concept by the work of political scientist Robert Putnam (1993). For him, social capital is defined as "the features of social organizations, such as networks, norms, and trust, that facilitate action and cooperation for mutual benefit'' (Putnam, 1993). The adoption of the concept is in part a search for new paradigms with which to confront the problems of contemporary society (Edwards & Foley, 1997).

Researchers have criticized Putnam's definition because of his generalization of associational life to civic engagement (Edwards & Foley, 1997); the bias for the positive

aspects of social capital and neglect of negative aspects (Portes, 1998); and confusion between the causes and outcomes of social capital (Lin, 1999). In spite of criticisms, the concept has been widely used in the study of social networks and social relations.

A different treatment of the concept can be seen between political scientists and economists, and other social scientists. The first group uses the concept in a more normative way, focusing on relationships among associations, generalized trust and other attitudes and norms, and social, economic and political outcomes. Network analysts and applied social scientists adopted versions of the concept more in keeping with the social structure, emphasizing individual and organizational ties in predicting individual advancement or collective action (Foley & Edwards, 1999).

The definition of social capital I adopt in this thesis follows Bourdier (1986), which is "the aggregate of the actual and potential resources which are linked to possession of a durable network of relationships of mutual acquaintance and recognition… which provides each of its members with the backing of the collectivity-owned capital, a 'credential' which entitles them to credit, in the various senses of the word". The resources stated above can be seen in terms of financial resources, knowledge, skills and abilities, which also can be called economic and cultural capital (Bourdier, 1986; Coleman, 1988; Oh, Chung & Labianca, 2004).

It has been identified that social capital is an asset that reduces the costs of collective actions, and facilitates cooperation (Pretty &Ward, 2001). Taking advantage of this conception of social capital, many development agencies aiming to reduce poverty, as well as to generate participatory natural resource management and conflict resolution related to natural resources, have been investing in creating social capital,

which in this case means creating groups and networks (Portes & Landolt, 2000). In this process, scientists have been neglecting structural conditions under which social capital is created, and how this affects the type of resource obtained in social relationships. Therefore, it is important to consider that not all social capital is equal. It varies according to people's values and attitudes, interests and structural conditions (Edwards & Foley, 1997). Moreover, depending on the type of social capital, it may or may not generate positive outcomes for the collectivity, and for democracy (Foley & Edwards, 1999; Edwards & Foley, 1997).

Literature describing criticism of the social capital approach argues that it neglects structural factors, such as cultural and historic aspects (Portes, 1998), institutional design (Cleaver, 2005), the relations of power in an existing social structures (Adhikari & Goldey, 2010), and the structural condition of groups, especially the poor and very poor, which prevents them from having access to resources, to have room to maneuver, and to represent their interests (Cleaver, 2005; Thorp, Steward & Heyer, 2005). Another criticism is the lack of concern with gender and ethnic inequalities in social capital approaches (Cleaver, 2005; Molyneux, 2002). On the other hand, the positive aspects of the approach are that it facilitates collective actions through the reduction of transactional costs of monitoring and enforcement of natural resources management (Folke, Hahn, Olsson & Norberg, 2005; Pretty & Ward, 2001), increases people's access to microcredit initiatives (Anderson, Locker & Nugent, 2002), and increases their power of influencing policy decision-making and implementation (Jacobi & Monteiro, 2006; Paxton, 2002).

It is important to note that social capital cannot substitute for the provision of education, health, and other structural resources, and should not be understood as the only solution for development problems, such as poverty and inequality. Instead it can be seen as an important component of the process to fight these problems, especially considering evidence of the effectiveness of participatory groups and associations in bringing about equitable and sustainable solutions to local development problems (Jacobi & Monteiro, 2006; Pretty, 1995).

Some research recognizes the importance of within group social capital (Adler & Kwon, 2002; Oh, Chung & Labianca, 2004; Upton, 2008; Adhikari & Goldey, 2010). When a group is formed, a series of social and organizational changes take place, shaping the group performance and resilience (Pretty & Ward, 2001). Organizational characteristics lead to different social processes and structures that are expected to change over time, influencing group performance and the production of social capital (Eastis, 1998; Pretty & Ward, 2001). An understanding of group performance is important to ensure that programs that are forming groups are achieving their objectives. Reflection of performance can also contribute to the identification of weak aspects that should be improved, as well as the strengths of the programs and policies (Curtis, Van Nouhuys, Robinson & Mackay, 1999).

In terms of group development, Gersick (1988) described two main streams of research on group development, one related to group dynamics, and the other related to phases of group problem solving.

More recently, Pretty and Ward (2001) reviewed the evolution of organizational structures, commonly characterizing diversity in structure and performances, also

according to stages or phases. From this review, they developed a typology to describe the evolution of human and social capital in groups. The typology proposes that groups can be found to be at three stages of maturity, namely reactive-dependence, realization-independence and awareness-independence. However, it is not clear if the typology describes discrete stages or whether there is a continuum of steady change (Pretty & Ward, 2001).

The reactive-dependence is the least mature stage, in which the group is created in response to a threat or crisis, and its objective is simply to address a specific desired outcome for which it was created. There is some recognition of group value, but the group does not decide rules and norms of operation, which tend to be externally suggested or borrowed. Individuals are still looking for external solutions, and tend to be dependent on external facilitators. Realization-independence is the middle stage. Groups in this stage are growing in independence, making sense of their new realities, increasing investment time in the group, developing their own norms and rules, and developing horizontal links with other groups. Awareness-independence is the highest stage of maturity, in which the groups are stable, difficult to break down, evolving in norms and rules they have developed, creating new venues to act, and confident in the group potential to change their situation.

These stages of maturity are progressively associated with the performance of the groups. Therefore, groups in the more mature stage are expected to be more successful in obtaining their planned outcomes than groups in the middle and lower stages, and similarly, groups in the middle stage are expected to achieve more of their planned outcomes than groups in the lower stages. This model is different from the

previous one because the authors used studies with therapy groups with very specific and inward tasks as well as naturally occurring groups responsible for creating concrete products for outside use and evaluation (Gersick, 1988; Tuckman, 1965).

Westermann and colleagues (2005) created some indicators to systematize the variables described above, in a study of gender influences on social capital manifested in groups for natural resource management. However, there are significant challenges to the functionality of models that describe group development, such as exploring how groups change from one stage or phase of development to another, the influence of the context and group life-span on group changes, and how to create and maintain group cohesion (Zander, 1979). In addition, it is important to understand if non-linear development models are sufficient to understand group development (Gersick, 1988). Pretty and Ward (2001) also question how to encourage transformations that will lead to more mature groups and sustained progress, which needs further investigation to be answered.

1.5 Research Questions

This study considered the 13 groups formed within the Projeto Pólen context, to test Pretty and Ward's (2001) supposition that more mature groups would be more successful than less mature groups. Due to time and scheduling constraints, I was not able to analyze the actual development of each group's projects. Instead, I used each group's final project plans as one indicator to evaluate group success. Considering that systematic planning, implementation and evaluation are foundations for effective programs (Jacobson, 2009), I assumed that the quality of the 13 groups' project plans would be a reliable indicator of the group's potential to accomplish its planned outcomes.

I also collected information on groups' self-initiated activities, in order to verify if more mature groups have also completed additional activities, not suggested by UFRJ, while less mature groups have not. A third indicator of group success involved the UFRJ coordinators in rating each project on a 5-point scale. My research questions were organized as follows:

- Do the groups in the awareness independence stage have more complete and systematic final project plans than groups in the reactive-dependence and realization-independence stages?
- Have more mature groups completed additional self-initiated activities, not suggested by the UFRJ team, such as presentations, organized public meetings, and participation in forum and other groups while less mature groups have not?
- How is group success as assessed by UFRJ team associated with group maturity?

I explored the causes for these conditions through guided discussion, as well as identified critical points to be developed in order to assure group resilience and good performance. Based on my findings, I make recommendations for the improvement of education for environmental management programs in the licensing process.

Table 1-1. Municipalities involved in the Pólen Project, divided by meso-regions, and group membership description.

		Number of public workers		Number of short term capacity building participants		
Meso-regions	Municipalities	Environmental	Educational	Government (technician or teacher)	Organizations of civil society	Total number of members
Baixadas						
	Casimiro de Abreu	-	1	-	2	3

Table 1-1. Continued.

Meso-regions	Municipalities	Number of public workers		Number of short term capacity building participants		Total number of members
		Environmental	Educational	Government (technician or teacher)	Organizations of civil society	
Baixadas	Rio das Ostras	-	1	4	3	8
	Araruama	2	2	-	-	4
	Armação dos Búzios	1	1	1	2	5
	Arraial do Cabo	2	-	-	-	2
	Cabo Frio	1	2	-	-	3
	Saquarema	0	2	-	-	2
Norte Fluminense						
	Campos dos Goytacazes	1	3	1	-	5
	São Francisco de Itabapoana	1	1	1	-	3
	São João da Barra	-	1	-	2	3
	Carapebus	-	-	-	-	2*
	Quissamã	1	1	-	-	2
	Macaé	2	2	-	-	4

*In Carapebus, the two public workers are from the Secretariat of Culture. This secretariat release time from the workers normal duties and gave a physical space to the group.

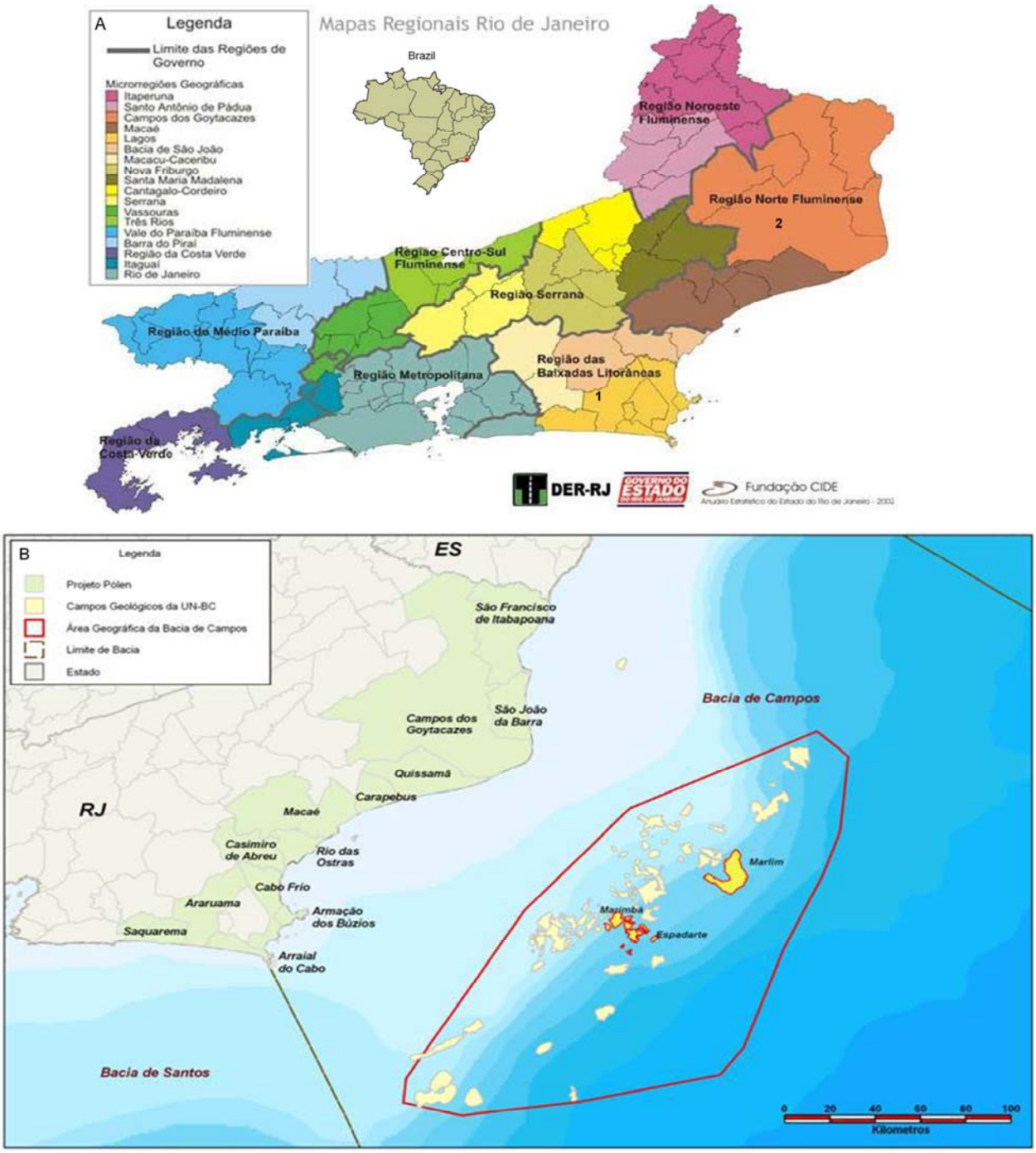

Figure 1-1. Map f the research area. A) Rio de Janeiro State divided in meso-regions: 1-Baixadas meso-region, 2-Norte Fluminense meso-region; B) Municipalities involved in the Pólen Project, and the oil and gas fields offshore surrounded by a red line. Sources: Fundação Cide and Petrobras.

CHAPTER 2
METHODOLOGY, RESULTS AND DISCUSSION

2.1 Methodology

During May to July 2009 I conducted semi-structured interviews with the groups' members of the Pólen Project, as well as with the UFRJ coordination team. The members included representatives of local government and civil society organizations that worked on a regular basis with a group, for a total of 45 people. The UFRJ coordination team is composed of three general coordinators, four group coordinators, who monitor the groups closely, and one psychologist, for a total of eight people.

I also collected copies of the Pólen Project biannual technical reports, in which they have registered all activities under the scope of the project, as well as self-initiated activities developed by the groups. I used the reports to assess the self-initiated activities developed by the groups. In addition, I collected copies of the 13 project plans developed by the groups, in order to assess group success through the evaluation of their project plans.

Individual and group interviews were recorded for subsequent analysis. All statistical analyses made in this study were run in the JMP program, version 8.0.

2.1.1 Group Maturity Measurement

The group maturity measurement was based on the model proposed by Pretty and Ward (2001). The variables I used included worldview and sense-making, internal norms and rules, external links and networks, and group lifespan (Figure 2-1). The worldview and sense making variable is related to what degree members perceive to be the group's objective, going beyond the task suggested by the UFRJ coordinators. The measurement of internal norms and rules are related to what degree the groups have

internal division of labor, regular meetings, recognition of group value, and self-analysis. The external links and networks measures are related to individual horizontal links (organizations in the same level of power) and vertical links (organizations with action on a broader scale). The group lifespan variable measure is related to the group's ability to solve internal conflicts (resilience), and their chance to continue after the first project implementation (persistence). I excluded the concept of technologies and improvements, present in the Pretty and Ward (2001) model, because of its specificity to the use of technologies to manage natural resources, which is not pertinent in this context.

The 12 open-ended questions used to access information with groups' members, are based on Westermann et al. (2005) (Appendix B). The variables have different numbers of component questions based on my ability to operationalize all the variables and preserve the internal validity of the measurement.

To each question's response, a three-point scale value was allotted, and the value of each question was calculated as the mean of the individual response' scores. The variable was calculated as the mean of each component question, and group maturity was calculated as the mean of the variable scores, so that the higher the group score, the greater the group maturity. As I worked with the average for all calculations including the group maturity, the number of questions per variable did not imply a different weight in the maturity score. The intervals of each stage of maturity were calculated by the higher maturity score divided by three.

I recorded and took notes on all qualitative explanations of each maturity measurement. The interview guide was pre-tested twice, to certify whether the

indicators and the way the questions were formulated were meaningfully capturing the ideas contained in the respective variables (Adcock & Collier, 2001; Bryman, 2008). A hierarchical cluster analysis was run to identify any distinguishable sub-group division within the groups according to similarities within the variables scores, and a T-test was run to identify the variable(s) responsible for the similarities. I also used descriptive statistics to analyze the data.

2.1.2 Evaluation of Project Plans

The evaluation of the groups' project proposals followed the criteria described by Jacobson (2009) for systematic planning, implementation, and evaluation of effective programs. The criteria are composed of eight items, four of which were posed as questions in the interviews (Appendix C). Each evaluation item was assigned a one-point value, and some of the items were composed of sub-items with a summed value equal to one. The evaluation score is the sum of each item; the higher the score, the better the group planning proposal.

To answer research question 1, verifying if there is an association between maturity measurement and project plan evaluation score, I ran a correlation analysis with the group maturity and the project plan evaluation scores.

2.1.3 Self-initiated Initiatives

I analyzed all reports of the Pólen Project development, to identify activities completed by the groups that were not suggested by the UFRJ team.

In order to answer research question 2, and identify if there is a relationship between group maturity score and number of self-initiated activities, I ran a correlation analysis.

2.1.4 UFRJ Success Score

During the interviews with the UFRJ team, I asked what criteria they would use to characterize a successful group. After this, I asked them to classify each group using the criteria they had described, on a 5-point scale.

In order to answer research question 3, verifying if there is an association between the UFRJ team score and the group maturity measurement, I ran a Pearson correlation analysis. To verify which variable of group maturity is most associated with the UFRJ success score, I conducted a multiple regression analysis using all the components of group maturity as independent variables in relation to the UFRJ success score to create the full model. From this full model I conducted backward stepwise selection excluding explanatory variables with $p>0.1$. As only one explanatory variable was included in the minimal model, no further analysis was needed. I also used descriptive statistics to analyze the data.

2.1.5 Civil society participation in the groups

During the interviews, I asked open-ended questions to participants, both public workers and civil society representatives. Questions were about the difficulties and advantages of working in a group composed by public workers and civil society representatives. The responses were analyzed using qualitative content analysis.

2.2 Results

2.2.1 Group Maturity and Evaluation of Project Plans

There was no significant correlation between group maturity and evaluation of project plan score ($r=0.23$, $p=0.44$; Figure 2-2). Table 2-1 shows a description of the topics of the group's projects.

The maturity values vary from 1.75 to 2.60 (Table 2-2). Two groups were classified in the reactive-dependence stage, six were classified as realization-independent groups, and five were classified as awareness-independent groups. The cluster analysis identified two main groups (Ward's linkage method, distance=3.55), grouped by the variables internal norms and rules ($t=3.81$, $p<0.05$) and group lifespan ($t=2.80$, $p<0.05$), as shown in figure 2-3.

2.2.2 Group Maturity and Self-initiated Activities

A total of 26 self-initiated activities were identified in project reports. The number of self-initiated activities was not correlated to the group maturity measurement at p level lower than 0.05 ($r= 0.483$, $p=0.095$; Figure 2-4), although there is a strong trend. In addition, groups in the awareness-independence stage participated/ organized more self-initiated activities than groups in the other two stages of maturity, and based on that I will assume that the correlation was marginally significant.

Self-initiated activities in celebration of Environment Day on June 5th were the most common self-initiated activity of groups. Other activities are related to municipalities organizing meetings among themselves to discuss their group dynamics and projects (São João, São Francisco and Campos dos Goytacazes), and the organization of one meeting with the Secretariats of Education and Environment of three municipalities (Arraial do Cabo, Cabo Frio and Armação dos Búzios), with the goal of explaining to the officials the Pólen Project, their role in the project, and the importance of the capacity building process, aiming to increase the support given by the local government to the project. The municipality of Araruama influenced the creation of a decree institutionalizing the environmental education group formed by the Pólen Project in the municipality, and the municipality of Macaé influenced the creation of a

law that institutionalizes the Technical Cooperation Agreement. Four groups are involved in collective public venues. Araruama and São Francisco are involved respectively with an environmental education technical chamber of a watershed committee, and with a Consultive Council of the Guaxindiba Ecological Reserve. Macaé and Rio das Ostras, due to the nature of their projects, are involved in collective public spaces under the City Master Plan (Brasil 2001), respectively with the Council of Royalties and the Participatory Budget (Table 2-3)

2.2.3 Group Maturity and UFRJ Success Score

There is no statistically significant correlation between the UFRJ success score and group, although there is a trend ($r=0.33$, $p=0.26$; Figure 2-5a). The groups from Cabo Frio and Rio das Ostras had internal cleavages during the time I interviewed the UFRJ team and the group itself. In one case, the group had recently lost one member because of internal conflicts. This was not perceived yet by the UFRJ team as impacting the group performance, which classified it as a successful group, while the group classified itself as having low maturity. In the other case the opposite pattern happened, with the UFRJ perceiving the group as having substantial problems, but the group, recently re-structured with new members, did not identify the same negative aspects. As a result, the UFRJ classified it as unsuccessful while the group perceived itself as mature. Running the correlation without these two groups, the correlation result was almost significant and with a strong trend ($r=0.58$, $p=0.056$; Figure 2-5b), which corroborates the idea that these two groups are outliers. Considering the small size of the sample ($n=13$), the strong trend and the p value, I will consider that there is a positive significant correlation between group maturity and the UFRJ success score, with $p<0.1$.

A qualitative content analysis identified that three criteria described by the UFRJ are also components of the maturity measurement (Table 2-4), yet the frequency of occurrence of these common components per coordinator was low.

The backward stepwise selection result shows internal norms and rules as the variable of the group maturity measurement most correlated to the UFRJ score ($R2$ adj $=0.34$, $p \leq 0.05$; Figure 2-6). In all models tested, “internal norms and rules” was the only significant variable, and was always positively correlated to the UFRJ team score.

2.2.4 Civil society participation in the groups

The groups from Casimiro de Abreu, Rio das Ostras, Armação dos Búzios, and São João da Barra, consist of public workers and civil society representatives who work on a regular basis. They have regular meetings, and plan and implement activities related to their group project and self-initiated activities. These groups do not have an internal hierarchy, and members appreciate the complementary perspectives created by the meeting between civil society and government. The groups from Campos dos Goytacazes, São Francisco do Itabapoana and Quissamã do not have civil society representatives participating in their regular activities, but have them participating in the self-initiated activities they promote. When this research was conducted, the group from Saquarema was trying to involve the civil society representatives. The groups from Arraial do Cabo and Araruama e Cabo Frio do not have contact with the civil society representatives from these municipalities, involved in the short term capacity building of the Pólen Project (Table 2-5 and Table 2-6).

Each municipality has a different context, which shapes the relationships among public workers and the civil society representatives, and hence their work as a group. Despite the contextual particularities, some common perceptions regarding the

difficulties and advantages of working with the civil society representatives can be identified, as described in Table 2-5 and Table 2-6. The difficulties perceived by the two stakeholder groups with this relationship are public worker fear of political problems, lack of financial resources to promote civil society participation (transportation, food, etc.), and civil society representative impatience with the lack of short term results and the pace of the Pólen project. The difficulties perceived by groups that had civil society participants in their self-initiated activities are the lack of financial resources to promote civil society participation, difficulty in arranging convenient meeting times, civil society representative dissatisfaction with the pace of the Pólen project, public worker fear of negative political reactions, and lack of motivation of civil society members to work as a group. Groups that did not have contact with civil society representatives stated that it was due to a lack of motivation/identification with the cause on the part of the civil society representative, the difficulty to find convenient meeting times, lack of financial resources to promote civil society participation, and public worker fear of negative political reactions.

The advantages perceived by the groups with civil society members are the commitment of members, the legitimacy given by civil society to group work, civil society freedom of speech, focus on the work, and to have input of the previous experience from civil society to group. Among the groups with civil society participating in their self-initiated activities the perceived advantages were to have more people to work, and input of previous experience from civil society to group. The groups that have no contact with the civil society representatives stated that the advantages would be to have more

people to work, input of previous experience from civil society to group, and the freedom of speech of the civil society.

2.3 Discussion

Group maturity was associated with several elements of group success. This study assessed these relationships based on three success criteria: project plan evaluation; occurrence of self-initiated activities; and ratings by UFRJ, the coordinating organization.

2.3.1 Group Maturity and Project Plan Evaluation

One possible explanation for the lack of correlation between the maturity score and the project plan evaluation score is the support given by the UFRJ to all groups during project planning. All groups declared they received this support continuously during the writing process. Thus, the projects were not only a product of the groups, which would reflect the group maturity, but also, a result of the joint work of group members and the UFRJ team. This fact confounds the influence of maturity on the group project, possibly resulting in the lack of significant association between the two scores.

During the elaboration stage, each group was urged to define evaluation criteria. However, most indicators developed by the participants lack clarity and objectivity. This is probably due to the fact that the participants do not have much experience in planning and implementing projects, as they stated. Most people declared they have experience in implementing projects planned by their superiors, and in being evaluated, more than they can self-evaluate. Therefore, the creation of evaluative indicators is one initial step in their learning process, which will probably be better understood as their projects begin.

Another possible explanation is related to the top-down nature of the public policy and the Pólen project. The project plans developed by each group were not constructed in response to local community demands, but instead, were constructed in response to a demand of the state. Following a participatory approach, many projects have as initial activities the implementation of socio-environmental diagnostics, in order to understand the community's needs and to build on that. As a consequence, some items lack clarity of objectives and methodologies, and lack previous community consultation, resulting in a low project evaluation score. Part of this lack of clarity should be addressed after the planned diagnostic, in which groups will have a better idea of the local communities' demands, and willingness to participate in the group project.

Project development is a very important phase of the Pólen project, because it is at that stage that the project will reach the groups most affected by the oil and gas activities. The projects were planned based on the perceived issues that the participants identify in each municipality, and as a result, they show different approaches. The impacts of the oil and gas exploration vary from one region to another. The municipalities in the Baixadas meso-region (Table 1-1), with the exception of Rio das Ostras, tend to perceive fewer impacts of the oil and gas development, because of their physical distance from their operations on land (Marisco, 2008). The municipalities in the Norte Fluminense meso-region feel more impacts of the development through the company activities on land, and the use of maritime space in the region (Marisco, 2008). As a consequence, the municipalities in the Baixadas meso-region are working with the principles of public environmental management applied to their local context, and using oil issues as a complementary discussion (Table 2-1). They plan to foster the target

social groups' organizations by discussing and organizing their demands. The municipalities of the Norte Fluminense region are working with communities directly affected by oil and gas activities, such as communities of fishermen and communities affected by pipelines (Table 2-1).

Participants identify some difficulties that can undermine their performance in implementing the project. One problem is the short time they can dedicate to project development. Most participants have eight hours per week of release time from normal duties. However, in many cases they have the same work load as before the project, and cannot dedicate all eight hours to the project. In addition, some participants said that even the eight hours of release time is not enough to accomplish all the tasks they have to promote the project.

Another major concern for participants is how to get the interest of the local communities in order to participate in their projects. Six groups did not visit the communities when planning their projects. At the time of the interviews, some groups were launching their projects, and in some cases, the communities with which they were willing to work were not present. The participants' concern is legitimate; it is difficult to get local communities involved in new projects developed by external agencies, especially those that do not promote immediate, material outcomes, but only a learning process that will provide outcomes in a medium or long term. This situation can be seen with the fishing communities in the region, which were targets of different projects and policies, but whose structural conditions still did not improve (Moraes, 2004).

Other perceived challenges are related to the physical distance from their offices to the communities, which in some cases is far; how to create a strategy to deal with

government oversight and attempts of group cooptation; how to find extra time to dedicate to the project; and to be prepared and motivated to work with local communities, with whom most participants do not have experience. The continuous support of the UFRJ team is important in this context to motivate and help the participants define strategies to deal with these difficulties.

2.3.2 Group Maturity and Self-initiated Activities

Groups in the higher stages of maturity had significantly more self-initiated activities. More mature groups shape their realities forward with a critical perspective, are aware of group value and the value of partnerships, and are more likely to make partnerships to achieve higher-level goals (Pretty & Ward 2001).

The group with the most self-initiated activities is Campos dos Goytacazes. This is related to initiatives from the group itself as well as to stimulus given by the Education Secretariat. The Secretariat wants the group to develop activities with the teachers of the municipal public schools. Influence from officials is also seen in Carapebus, where the Secretariat wants the group to develop activities using their own target audience (children and elders). Demands from the local Secretariats can become a challenge to the participants, since they have the same amount of time to plan, develop and implement their group project and what the Secretariat demands.

The groups from Campos dos Goytacazes, São João da Barra and São Francisco do Itabapoana work in a partnership. They are all in the Norte Fluminense region, sharing similar socio-environmental problems, such as impacted fishing communities. In response to this, they developed an event that brought together governmental representatives of the three municipalities, to discuss problems related to the mangroves in the region, as well as the well-being of the fishermen that rely on this

environment. They also promote regular meetings to discuss their projects, difficulties and potentialities, and to help develop each other's projects.

These groups seem to be motivated by the Pólen project, using the resources and opportunities offered by the project, such as proximity to researchers and logistical support to develop joint actions in their municipalities. The support given by the Secretariats is important to make these self-initiated activities happen, to give visibility to their work, and to justify their released time from normal duties. At the same time, visibility of activities is an important strategy to inhibit the Secretariats from manipulating group activity. The incorporation of the groups and their projects by the Secretariats through a manipulative approach would undermine the participatory framework that groups are trying to develop, and the political dialogue about participatory ideas (Dagnino, 2002b).

The group in Araruama influenced the creation of a decree institutionalizing the environmental education office, with the support of the former mayor. The decree states that the office should be run by the people who passed the capacity-building course of the Pólen project. In this case, the group tried to ensure their priority in using the space and resources. The group from Macaé followed a similar path. With the support of a former alderman, the group influenced the creation of a law institutionalizing the technical cooperation agreement (TCA). The law legitimized the release time and activity development offices allotted to public workers. While the institutionalization of the office and TCA does not guarantee that it will be respected, the existence of the legal requirement is a first step toward fulfilling the legal obligation (Dagnino, 2002a). The use of these resources must be secured; since many secretariats lack equipment

such as modern computers (Projeto Pólen, 2006), and there is a risk that this equipment will be incorporated to secretariat patrimony, and the groups will lose the priority to use it in their projects.

Most of the activities that the groups promoted were related to forums and presentations. It is interesting to note that the audiences of these activities are mostly students (high school and undergraduate) and local government officials. Just two activities reached local communities through media, besides schools. In the case of Arraial do Cabo, the group in Arraial do Cabo developed an activity for fishermen as a first step in their own project, which aimed to improve communication to reduce social and environmental conflicts in the marine extractive reserve (RESEX). In the second case, the group from São João da Barra promoted an event in the community of one of the civil society representatives. In these cases, groups shared their discussions with a local community, and strengthened the relationship with group members.

Four groups are involved in public collective venues for civil participation in environmental issues. Araruama and São Francisco do Itabapoana are involved respectively in an Environmental Education Technical Chamber of a Watershed Committee, and with a Consultive Management Council of the Guaxindiba Ecological Reserve. In the case of Araruama, the member who had attended the EE Chamber before the project is now representing the Pólen group. The São Francisco group was invited in recognition of their work in the municipality. Macaé and Rio das Ostras developed projects that aimed to strengthen venue participation under the City Master Plan (Brasil, 2001) the Royalties Council and the Participatory Budget Council, respectively. Therefore, it is part of their project to be present in these venues.

Group maturity resulted in more self-initiated activities that gave visibility to group actions, which in some cases increased the Secretariats' support to groups, reduced the risk of group manipulation, helped secure equipment, and also provided an opportunity for groups to discuss their projects and dynamics.

3.3.3 Group Maturity and UFRJ Success Score

There is a significant positive correlation between group maturity and the UFRJ success score, which suggests that the Pretty and Ward (2001) model of group maturity is a reliable indicator of groups' success, and can be used as a basis for group interventions, to improve their work effectiveness. Two different scales were used to measure maturity versus UFRJ success rating, and the two scores may have influenced the results.

The variables taken into consideration by the UFRJ success score are: a good relationship with the Secretariats; member motivation and self-identification with environmental education issues; and technical knowledge; among others (Table 2-4). On the other hand, the group maturity measurement takes into consideration aspects such as members' confidence in group potential, self-evaluation events, links with other organizations, and their willingness to continue after the first project.

The criteria used by the UFRJ team pertain to group context and appropriateness of participant profiles for their selection criteria, which are based on an evaluation by the UFRJ team. Evaluations by internal members tend to focus on project goals, achievement, and on the procedures adopted, while evaluations by external actors tend to focus more on specific outcomes (Jacobson, 2009). It is important to garner different views on the same groups, in order to capture both the internal and external perspectives that can help improve program performance.

When evaluating the groups, the UFRJ coordinators took into consideration historical facts and processes to classify current group success. As one UFRJ coordinator commented:

> They have always turned in the assignments late, and I always have to push them to do things, because they don't have initiative. Now I think things are getting better with the help of the civil society representatives, but I will only believe the group is better when they start developing the project.

The maturity measurement, in contrast, does not take the temporal aspect into account in the model, which is a shortcoming of models aiming to explain group development (Gersick, 1988; Jehn & Mannix, 2001). As a consequence of the lack of temporal measurements, a recently re-formed group, such as one of the outliers, which had completely broken down due to internal political conflicts, was classified as being in the awareness independent stage. If temporal measurements accounted, for instance, for previous conflicts or breakdowns, a more accurate perspective of maturity would have been acquired. This temporal perspective needs to be incorporated in the Pretty and Ward (2001) model in order to have a more accurate perspective of internal group relations that lead to successful outcomes.

The multiple regression result showed that the variable of internal norms and rules caused variation in the UFRJ success criteria (R^2 adj= 0.34, p= 0.02). Internal norms and rules define the group routine in terms of division of labor, frequency of meetings, and belief in their potential to achieve group outcomes.

The process of establishing norms happens when members interact and spend time with each other (Feldman, 1984). At this time, they characterize how the group members keep in line with the group objective, as well as how they will develop an atmosphere to make use of limited time and resources, and create the feel of the group

(Eastis, 1998; Thorp, Steward & Heyer, 2005). As groups did not exist before the project, most groups were formed by people who did not know each other prior to capacity-building. Thus, the members started new relationships, established new norms to communicate with each other, and followed their own pace, in order to develop assigned tasks (Gersick, 1988).

During the interviews, most groups declared they had regular meetings and division of labor and roles when executing tasks, such as writing the project plan, or organizing an event:

> We have time to be here at the office. But we only have division of labor and rules when conducting an event. We divide the labor to make the event happen, but only at those times.
>
> When we were writing the project, we had some rules, such as everybody should agree with all points we added. Kíssila types very well and she was the one responsible for that part. I know more about legislation and the environmental problems here in the municipality, thus I contributed more with this part while elaborating the project.

During the interviews, most groups had already finished their project plans, and were waiting for approval from IBAMA to begin implementing their project. During this time, groups did not have any assigned task, and most stopped having meetings. The absence of a clear objective task seems to be an important factor in the lack of clear rules and division of labor in some groups at that moment. Regular meetings seem important in giving participants time together and opportunities to develop internal norms, considering that they will start developing a two year project in a local community.

Another important aspect of internal norms and rules is the fact that few groups have done an evaluation of their own development and actions. They have made evaluations regarding capacity-building and group dynamics, with the psychologist of

the UFRJ team only. It is common for things to go unnoticed in the routine (Gersick & Hackman, 1990); group members talk far less about things they do routinely than about extraordinary actions they have taken. Researchers have done relatively little systematic research on group routines (Gersick & Hackman, 1990). The tendency to not analyze routine actions and the few tasks conducted outside the scope of the Pólen project may be responsible for the lack of self-evaluation.

Self-evaluation, nevertheless, can be a mechanism to empower groups and their members, by fostering improvements and self-determination (Fetterman, 1994). This idea, born in community psychology and action anthropology, is described by Fetterman in this way:

> The ability to chart one's own course in life forms the theoretical foundation of empowerment evaluation. It consists of numerous interconnected capabilities that logically follow each other. A breakdown at any juncture can reduce a person's likelihood of being self-determined. They include the ability to identify and express needs, establish goals or expectations and a plan of action to achieve them, identify resources, make rational choices from various alternative courses of action, take appropriate steps to pursue objectives, evaluate short-and long-term results (including reassessing plans and expectations and taking necessary detours), and persist in the pursuit of those goals. (pg 2)

Thus, the stimulation of self-evaluation procedures can represent an important strategy to improve the groups' projects, through the illuminating process that comes from analyzing previous happenings, as well as by perceiving existing resources in a new light, enabling them to find new opportunities to redefine their identity and future roles (Fetterman, 1994).

One example of the power of self-evaluation is the response of two groups that developed a rule banning self evaluations, to avoid unveiling structural conflicts within the group. Feldman (1984) describe three types of norms, two of which I believe fit with

these situations. One is a set of norms adopted by group members to discourage topics of conversation or situations in which someone's self image is damaged, called into question or embarrassed. The other is a set of norms that a group will enforce, that protect it from interference or harassment by members of other groups.

In one of these cases, the participants declared they have opted to not self evaluate their group in order not to expose an internal conflict with one member, and thus undermine the group survival. The problematic member was responsible for keeping the physical office space available to the group, and had conflicts with two other members who were experiencing weak support from their secretariats at that time, which suggested they were not likely to get another office space. The first of Feldman's norms fits with this case. In the other case, the group avoided self-evaluations because it would bring to light the topic of political control of the local government over group activities. The members were advised not to discuss environmental problems with a critical perspective; otherwise they would suffer sanctions. The second Feldman's norms description described above fits with this case.

Feldman (1984) also discusses how norms can be developed from explicit statements by supervisors or co-workers. The UFRJ indeed tried to make the groups develop their own regiments, in order to make the participants work together to create familiarity and become involved with the project concepts and tasks (Projeto Pólen, 2007). However, during the interviews, few groups discussed the existence of this proposed regiment, and among those who had such a document, it was outdated. This fact exemplifies the difficulty of imposing the creation of norms, which many times

already exist in a group, but often are informally set, not written down (Feldman, 1984), and are thus difficult to be perceived by external actors.

Gersick (1988) developed a model predicting that the first phase of group existence is marked by the establishment of an initial framework, which will only be changed when the group members find that old perspectives no longer work. This phase is similar to that of groups starting to implement their project. Many respondents stated they would have to develop new rules to coordinate the actions in the scope of their projects. For example:

> We are trying to develop a set of rules now that we need to work on our project. We need to be sure who is going to do what, in order to make sure everything will be done by somebody.

More research must be done in order to better understand how groups redefine their internal norms and rules based on tasks and context, and how external agencies can influence this process.

Member confidence in group potential, which is also one aspect of the variable internal norms and rules, is related to their confidence to positively impact the municipality and achieve the expected outcomes of the projects. These indicators were almost the same for all groups, and did not make a strong influence on the variable score.

Members are more optimistic in achieving their project outcomes than in their influence over their municipalities. In terms of their potential to achieve project outcomes, participants' main concern is related to how to get local people interested in participating, and if the group will have the necessary ability to deal with local communities' demands to implement its project proposal. On the other hand, the participants recognize some transformations will occur within the communities with

which they will work. Considering education as a long term process, they believe that in time they will see the results emerge, and that at least a few people in their target communities will have a rapid response to their discussion, engaging in more action.

In terms of influencing their municipalities, most secretariats, even supporting the TCA, do not give other types of support to groups, such as accessibility of officials, or support for the approach that groups are using to access and interpret local socio-environmental problems and conflicts. These types of support would be fundamental to influence the municipality beyond project scope, and the lack of these types of support undermines this potential.

2.3.4 Another Relevant Aspect Regarding Group Maturity Scores: Group Lifespan

The hierarchical cluster analysis identifies that internal norms and rules, and group lifespan, divide the groups in two sets: one with high scores in these variables, and another with low scores. The internal norms and rules variable was discussed in the previous section; therefore in this section I will focus briefly on group lifespan.

Group lifespan is related to group ability to solve problems; their chance of continuing after the initial project implementation; and to group ability to solve internal conflicts and to persist after the initial projects. The UFRJ team wants to continue supporting the groups, and also believes that the groups need to endure to support the communities they will work with during their projects. Part of the premise of education for environmental management is a continuous process of education, in order to deepen relations and understanding of socio-environmental issues (Quintas, 2006).

One point related to this is the uncertainty that the UFRJ will continue managing the Pólen project due to its temporary agreement with Petrobras. Every four years the agreement is re-evaluated and renewed, and there is no legal obligation for UFRJ to

continue being the institution developing the project. In addition, it is unclear to the groups whether they will be allowed to be funded through other sources, because of the previous link with Petrobras, or whether the company will continue to fund the groups, even without UFRJ. Another source of instability is the embedded nature of the groups in the municipal government. Once every four years, with the elections, all officials are changed, and support may change to all projects within the Secretariats. The UFRJ team helps groups in terms of assuring the TCA sign and fulfill agreements, but it cannot guarantee they will be always able to keep the TCA working. Participants recognize these uncertainties, which are reflected in their responses about the continuity of the group.

In terms of conflict resolution, one set of groups stated they have difficulty solving internal conflicts. This seems to be largely explained by the type of conflict these groups have. Conflicts can be categorized in three types – relationship, task, and process conflict (Jehn & Mannix, 2001). The relationship conflict is related to interpersonal incompatibilities, such as dislike among group members and feelings such as annoyance, frustration, and irritation. Task conflict is related to members' differences in viewpoint and of opinion about a task. Process conflict pertains to issues of duty and resources, such as who should do what and how much responsibility different people should get. Among the groups with a low lifespan score, I could identify three groups with relationship conflicts, one with task conflict, and no group with process conflict.

High levels of relational conflict can prevent groups from developing familiarity among its members, reducing beneficial information and other resources sharing, and compromising conflict resolution and task performance (Jehn & Mannix, 2001; Oh,

Chung & Labianca, 2004). Moreover, this type of conflict is the most difficult to solve, and most likely to generate group breakdown (Jehn & Mannix, 2001).

Task conflicts can enhance performance through a synthesis of diverse perspectives and an increase in understanding (Jehn & Mannix, 2001); however, members need to come to an agreement at some point, in order to make a viable solution to the conflict, and have a positive outcome. When a consensus is not reached, the group is susceptible to break down (Jehn & Mannix, 2001).

Most participants declared their group would not last without UFRJ support. This is explained by the support the UFRJ gives in negotiating with the secretariats over release time, the technical support given, and their role in mediating internal conflicts within groups. The same pattern was found in a study developed in villages in Nepal (Adhikari & Goldey, 2010). Part of their conclusion was that social capital can be induced, but it is hard to sustain, and that agency facilitation is crucial to enhance sustainability of groups.

2.3.5 Civil society participation in the groups

Groups vary in how they incorporate civil society representatives in their dynamics. In most cases, the civil society representatives are invited to participate in group activities, but not in the planning of the activities themselves. They are integral members in just four groups, in which they have a major role in planning and implementing the group project. Three groups did not have contact with the civil society representatives, even when the public workers indicated a preference for short-term capacity building.

It is important to note that in the four groups where they are completely integrated, three of them, Casimiro de Abreu, Rio das Ostras and São João da Barra, were able to persist due to the presence of the civil society representatives. Internal cleavages led to

the persistence of just one public worker in these groups, and the presence of the civil society representatives allowed the group to continue.

The difficulties of the interaction among public workers and civil society representatives vary according to their relationship. Public workers from the groups with no contact with civil society representatives, identify that there is a lack of motivation of the civil society to participate in the project. This can be related to two factors. One is the selection of these representatives, and the other is the top-down nature of the project. The selection of the participants may not be focusing on organizations from civil society that are willing to be involved with the groups and the issues of oil and gas mitigation programs. This would require a revision of the criteria and procedures of selection. The top-down nature of the project refers to the fact that the group formation and their projects do not respond to any public claim, but to public policy. As a consequence, people involved in the project are being suggested to embrace a new cause, with which they did not work before, Considering the problematic structural conditions of the local organizations, that lack resources to develop their main activities, it can be difficult to get them to add new topics to their agendas, and assume new responsibilities.

Among the groups with civil society representatives participating in the self-initiated activities, the problems they identify are related to the fact that the civil society representatives work during the time they have to meet and discuss their project and activities. This shows a conflict between public workers with released time from normal duties and civil society representatives without this released time. Thus, they do not find a common time to meet, reducing the chances of civil society participation in the groups.

Another problem that they reported is the lack of financial support for the civil society representatives. They state that the civil society representatives do not have money to pay transportation and food to spend a part of a day with the group; this reduces the chances that they will participate regularly in the group meetings.

Among the groups with a civil society representative, a major concern is a negative political reaction from the local government. The civil society organizations in these municipalities are often politically opposed to the local governments and the presence of these representatives in a project involving public workers is a sensitive topic. In one of these cases, the government explicitly ignores the presence of the civil society representatives, as a sign of its disagreement with their participation in the project, an explicit demonstration of the animosity that this topic can bring.

The secretariats in general have little involvement in the groups and project development, and most do not know about the possibility of civil society representatives being part of the groups. The historical lack of civil society participation in the public policies tends to create a tense relationship between society and government, and this tension is present in the efforts to increase public participation in policies (Dagnino 2002b).

In spite of the tension and animosity that the interaction between civil society and state can cause, an interesting process occurred in one municipality. The civil society representatives stated that they are learning how to propose action instead of just being reactive. On the other hand, the public worker stated she is learning how to deal with the demands of the civil society representatives in order to support them as well as strengthen the group. Teixeira (2002) discusses that as the closer and more horizontal

the relationship between organizations and the state, the more prone they are to create democratic values and alternatives to confront the different interests regarding a specific topic. In this sense, these four groups seem to be really building this type of relationship, generating new alternatives of performance in both stakeholders.

2.3.5 Organizational Characteristics Influencing Social Capital Creation

The variations in groups' internal norms and rules, lifespan, external links, objectives and support given by the local government influence the social capital generated within a group (e.g. norms and conflicts), and with the groups and other organizations (e.g. incorporation of civil society representatives in the groups). These variations in social capital will occur as a result of the influence of groups' procedures and variations in the internal and external context. These factors shape the types of resources they desire, their ability to secure these resources, the distribution of them among members, and their management over time (Eastis, 1998).

The group objective influences the definition of what resources are needed, and the strategies necessary to access them (Foley & Edwards, 1999). The internal norms and rules variable reflects the idea of groups' procedures. Groups with regular meetings tend to have members more engaged and familiar with each another, and groups that self-evaluate their actions tend to be clearer about their objectives and strategies. These factors can promote the generation of clear strategies of how to access the resources needed (Eastis, 1998). The group lifespan, defined as members' ability to solve internal conflicts and to persist after the first project, also influence the group strategy to acquire the resources needed, and add a temporal dimension. It also influences how the resources will be distributed among group members (Oh, Chung & Labianca, 2004). The group's external links are already an indicator of how the different

objectives, values and attitudes shape the networks established, for instance the acceptance and type of participation of the civil society representatives within the groups.

In terms of the context of each group, it is possible to observe how variations in support from local government influence members' performance. Compliance with the TCA, the public manager accessible to members, local government oversight and control, the position of members in the secretariats' hierarchy and the member's job security are factors influencing the members' performance, and thus their objectives, resources needed and partnerships intended. This agrees with previous research, which noted the influence of context in the creation of social capital, and the influence of institutional context on group internal relationships, performance, and networks (Eastis, 1998; Foley & Edwards, 1999; Oh, Chung & Labianca, 2004). It is also important to stress that local government institutional openness to civil society participation is also fundamental to allow participatory processes in public venues (Avritzer, 2009).

Another aspect not explored in this research, but also important to group organizational characteristics, is leadership. Leaders can help members coordinate their activities and keep the focus of the group on the desired outcomes (Zander, 1979). The absence of leadership within groups is recognized by the UFRJ team, which is trying to stimulate the development of leaders in the groups (Projeto Pólen, 2008).

2.4 Recommendations for Education for Public Environmental Management

From the observations of the Pólen project, some recommendations can be made in terms of both program development and institutional relationships. The Pólen Project methodology has been recognized by the oil and gas office of IBAMA as an exemplary

project and it may be replicated in other areas where there is offshore oil and gas exploration in Brazil.

One recommendation for program development is related to the profile of the selected participants. The Pólen project selected public workers to work in groups, planning and implementing a project in the communities. These public workers had previous experience with conservation education in schools (Projeto Pólen, 2006), but they were unfamiliar with each other before the project. They did not have previous experience working with communities, and they were not from the communities in which they worked.

The formation of new groups and new networks, as stated before, is a difficult task, since it takes time to build trust (Pretty & Ward, 2001), and relational conflicts can emerge, compromising the internal organization and group outcomes (Jehn & Mannix, 2001). Research on this topic found that groups composed of friends exhibit greater task conflict expression, which favor collective construction of ideas, and were better in solving unnecessary relationship conflicts than were groups of strangers characterized by instability and change (Shah & Jehn, 1993). Groups would also find it useful to continuously have activities leading to their project development, in order to keep them working together and thus developing their sense of a group. Groups with low internal norms and rules can be especially favored by this stimulation.

In addition, the selection of people without previous experience in working with communities, presupposes time for participants to develop the necessary skills to complete the assigned tasks. The duration of the environmental education programs in the licensing process depends on the relationship with the company, the UFRJ team

and IBAMA,which is unstable due to the political dynamic of the institutions in this context. In this regard, one important suggestion for future projects is to select people with experience of working together or in groups, and with previous experience with activities similar to those proposed by the project, to ensure that people will be able to achieve project outcomes successfully in the time frame available. This is also relevant when the external agency cannot give close support to participants. If the members have some previous experience with the assigned tasks, they are more likely to work without continuous support, than if the members are developing something completely new for them. In the Pólen project design, the external agency, UFRJ, formed groups to plan and implement projects. Group monitoring and accompanying processes seem to be fundamental to group member's confidence in their own work and to give technical support for project development. There is little research on the role of external agencies' contribution to the success of capacity building projects, which is also related to the lack of evaluation of educational activities. The results of Adhikari & Goldey (2010) demonstrate the importance the external agencies in maintaining induced groups . I suggest that monitoring and supporting participants is an important component in the process of building capacity, and it is relevant among groups formed to develop specific tasks, such as the case of the Pólen project groups. Continuous support allows the external agency to observe the development of a sense of group, the relevance and applicability of capacity building contents in the specific cases, the influence of local context and power relations on groups, and allows them to create and apply instruments of intervention to improve groups' work.

Another suggestion to improve group work is to stimulate empowerment reflection, based on the idea of empowerment evaluation, In Brazil, there is a social norm in which people avoid direct confrontation when they have disagreements; in this specific context, some groups avoid confrontation in order to ensure its persistence. This social norm can prevent groups from promoting self-evaluations, and thus to take advantage of its benefits, such as to identify and understand situations and context, to create new forms of access resources, to change expectations and roles, and redefine identity and future goals (Fetterman, 1994). As an alternative to stimulate the use of self-evaluations without promoting a tense environment, groups can promote regular self-reflections on their trajectory and work. This can be taught and facilitated, demystifying the evaluation process and ideally helping groups internalize their practices.

Another important point related to program development regards the partnership between civil society and public workers suggested by the Pólen Project. It is very important to provide a space in which public workers and civil society representatives can interact and exchange perceptions about the socio-environmental problems that their municipalities face. However, to provide conditions for an equal participation in the groups, it is necessary to improve the selection criteria of civil society participants, and better balance the capacity-building offered for both parties. In the capacity-building format, more emphasis is put on the public workers course, which lasts 2 years, whereas the course for civil society representatives is for one weekend and one four-hour meeting. The capacity building courses also occurred at different times, and some of the civil society representatives could not participate in the development of the project. This differential emphasis on the public workers formation influences group

performance and the quality of interactions. Rulke and Galaskiewicz (2000) in a study of how knowledge affects group performance, found that when information is held by multiple members, more people possess knowledge and group members may provide retrieval cues to each other, to aid the introduction of knowledge into decision-making. They also found that groups are more likely to share conceptualizations of one another's expertise, enabling members to pool information more effectively and make better decisions. Accordingly, investing in equal or equivalent capacity building to all participants can increase group effectiveness and improve integration among members.

The civil society representatives bring their experience in working with local communities to groups, helping increase members' confidence and motivation to develop their projects. From this research, it is also possible to see that in groups with civil society representative participation, members recognize the importance of empirical knowledge as a complement to the technical one, and recognize that the they have different perceptions, constraints and abilities that shape their abilities to intercede in the local conditions. This is an interesting indication of how collaborative interaction between public workers and civil society representatives can bring about a positive synergistic relationship, and it further confirms the importance of promoting this type of interaction.

The selection of representatives from the local communities where the projects will be developed is another suggestion that may improve the adequacy of the group projects and the receptivity by the communities.

Another important aspect to be taken into consideration is the possibility of having the participants developing small activities related to the final project, throughout the

capacity building time. In this way, participants are allotted time to identify the necessary skills they have and do not have to develop their intended project, and build confidence in their own abilities.

In institutional terms, it is important to strengthen the relationship between the federal agency IBAMA and the local government. The use of environmental education programs to build capacity with the local government is an important strategy of helping the public sector to incorporate a participatory perspective of socio-environmental conflicts and apply this perspective to decision making processes (Tatagiba, 2002). However, considering the instability of the municipal governments, greater support from IBAMA is fundamental to the maintenance of this type of project. Institutional partnerships between the federal agency and the local secretariats can increase the importance of the project inside the local Secretariats, buffering the effects of local political instabilities on the project. It is recognized by the UFRJ, as well as by researchers who analyzed other projects under the oil and gas licensing process, that local Secretariats tend to see mitigation projects as Petrobras corporative social responsibility projects, instead of a legal requirement the company must implement (Loureiro, 2009; Projeto Pólen, 2008). Visits and explanations by the UFRJ seem to be ineffective in clarifying this issue. Thus, in order to make clear to the local government the context of projects, their legal aspect, as well as the importance to mitigate the exploration impacts, IBAMA must be institutionally present.

The public workers stated that their individual performances changed after the capacity building. They adopted a more critical perspective of environmental issues, entangling environmental and social issues. However, they mostly occupy low-level

positions in the internal hierarchy, which lowered or prevented their input to the secretariats in the capacity building course of different perspectives of the environmental issues. Even the workers in coordinating positions do not have much room to discuss the principles of public environmental management inside their sectors. The chances of these public workers influencing their institutions are reduced, and if the Pólen project intends to extend this discussion to public institutions, other strategies must be developed.

This model of group maturity can be a useful tool to assess groups' organizational characteristics, and thus to develop interventions to improve these conditions and increase group and project success. Along with an evaluation of the outcomes of group projects, the Pólen project, and the process of environmental education in the licensing framework, this method can contribute to a comprehensive understanding of the project situation, in order to orient its development and help ensure success.

Table 2-1. Groups' project topics

Groups	Project Topic
Araruama	Mobilize the community of Praia Seca to participate more effectively in the management of the Massambaba Protected Area, through a historical, cultural, and ecological discussion of the area.
Arraial do Cabo	Build a communicative network to monitor the use of the RESEX and discuss problems and conflicts in the RESEX.
Búzios	Participatory elaboration of a map with socio-environmentally vulnerable areas.
Cabo Frio	Build capacity with three local fisherman communities, to make them participate in the public environmental management. Stimulate a discussion from their historical and cultural background.
Campos dos Goytacazes	Build capacity among the fisherman community and stimulate their participation in public environmental management

Table 2-1. Continued.

Groups	Project Topic
Carapebus and Quissamã	Build capacity among the communities impacted by pipelines and stimulate them to participate more effectively in environmental management.
Casimiro de Abreu	Build capacity among the local fisherman community to participate effectively in the management of the São João River and other issues of public environmental management.
Macaé	Contribute to the implementation of the Council of Royalties, implementing the guidelines provided by the City Master Plan
Rio das Ostras	Build capacity among youth on the oil and gas activities impacts to promote effective participation in the municipal participatory budget. Promote the First Municipal Conference on Royalties.
São João da Barra	Discuss with the fisherman community their historical, cultural and ecological knowledge, stimulating the creation of alternative solutions of their problems and an effective participation in the public environmental management.
São Francisco do Itabapoana	Build capacity among the communities in the Paraíba do Sul mangrove area, and discuss the socio-environmental problems of mangrove destruction.

Table 2-2. Group maturity scores per municipality.

	Municipality	Worldview	Internal Norms and Rules	External Links	Lifespan	Maturity	Stage
1	Araruama	3	2.25	1.75	1.88	2.22	2
2	Arraial do Cabo	2	2.5	1.875	3	2.34	3
3	Armação dos Búzios	2.2	2.44	2.05	2.5	2.30	2
4	Cabo Frio	2.3	2.33	1.5	1.33	1.88	1
5	Campos dos Goytacazes	2.4	2.12	1.65	2	2.04	2
6	Carapebus	2	2.3	1.625	2.5	2.11	2
7	Casimiro de Abreu	1.5	2	2	2.75	2.06	2
8	Macaé	2.5	2.35	1.9375	2.5	2.32	3
9	Rio das Ostras	2.25	2.43	2.125	2.81	2.40	3
10	Saquarema	1.0	2	1.75	2.25	1.75	1

Table 2-2. Continued.

	Municipality	Worldview	Internal Norms and Rules	External Links	Lifespan	Maturity	Stage
11	São Francisco do Itabapoana	3.0	2.33	2.25	2.83	2.60	3
12	São João da Barra	2.7	2.6	1.83	2.67	2.44	3
13	Quissamã	2	2.7	1.5	3	2.30	2

Stage 1: from 1.75 to 2.03; stage 2: from 2.03 to 2.31; stage 3: < 2.32.

Table 2-3. Self-initiated group activities of the Pólen Project groups

	Forums and weeks of discussion	Meeting with other groups	Meeting with Secretariats	Decree and Law Implementation	Hold a Meeting with all other Pólen's groups	Participation in Municipal activities	Simulation of a environmental disaster	Membership in collective venues
Araruama				X				x
Arraial do Cabo			x					
Armação dos Búzios	X		x		X			
Cabo Frio			x					
Campos dos Goytacazes	X	x						
Carapebus	X							
Casimiro de Abreu	X							
Macaé	X			X				x
Rio das Ostras	X							x
Saquarema								
São Francisco do Itabapoana	X	x						x
São João da Barra	X	x			X	x		
Quissamã	X					x	X	
Total	9	3	3	2	2	2	1	4

Table 2-4. Criteria mentioned by the UFRJ team as features of successful groups (n=8).

Indicator	# of times mentioned	Present in the maturity measurement
Good Institutional relationship	6	
Conflict solving	5	X
Division of labor	5	X
Motivation to work	5	
Involvement to the EE cause	4	
Be autonomous	3	
Technical knowledge	3	
Time	2	X
Partnerships	2	X
Volunteering	2	
Shared objectives	2	
Leadership	2	
Other	4	

Table 2-5. Challenges for civil society participation in the groups (%).

Type of Relationship	Municipalities	Time availability	Lack of financial resource	Lack of short term outcomes	Fear of political problems	Lack of motivation
No contact						
	Arraial do Cabo Araruama Cabo Frio	66.7	33.3	0	33.3	100
Contact in events						
	Campos dos Goytacazes, São Francisco do Itabapoana Quissamã Macaé Capabebus	60	40	20	20	20
Regular basis						
	Armação dos Búzios Casimiro de Abreu São João da Barra	0	33.3	33.3	100	0

Table 2-6. Advantages of civil society participation in the groups (%).

Type of Relationship	Municipalities	More people to work	Experience input	Freedom of speech	Commitment	Support from society	Focus on the work
No contact							
	Arraial do Cabo Araruama Cabo Frio	66.7	66.7	33.3	0	0	0
Contact in events	Campos dos Goytacazes São Francisco do Itabapoana Quissamã Macaé Capabebus	100	80	0	0	0	0
Regular basis	Armação dos Búzios Casimiro de Abreu São João da Barra	0	0	33.3	100	100.0	33.3

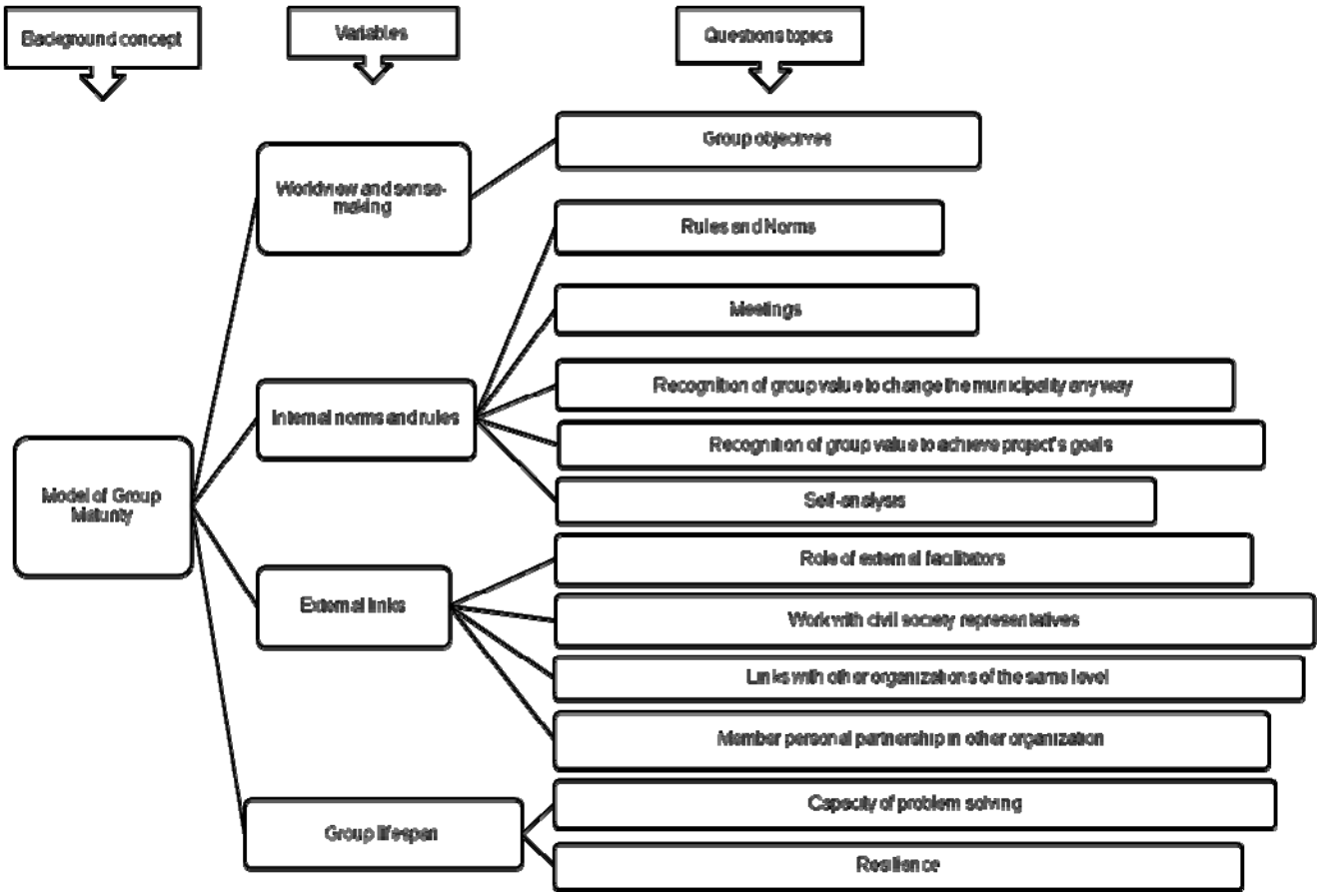

Figure 2-1. Conceptual model of group maturity, adapted from Pretty and Ward 2001.

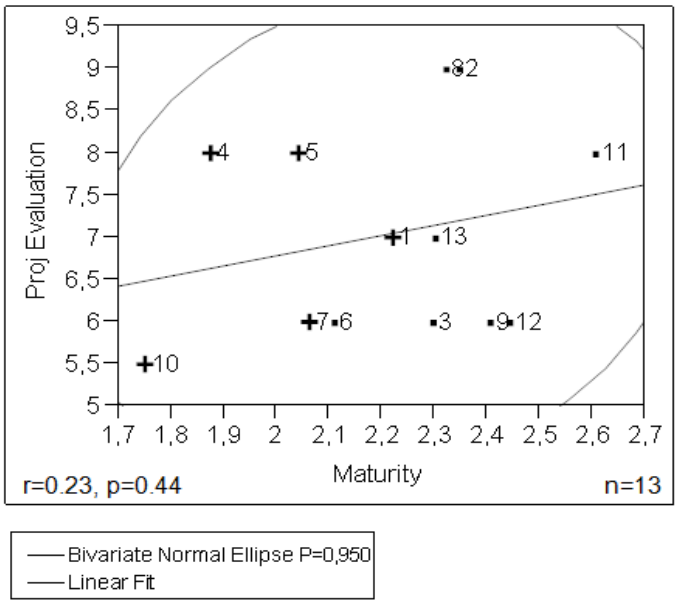

Figure 2-2. Correlation between project evaluation score and maturity score

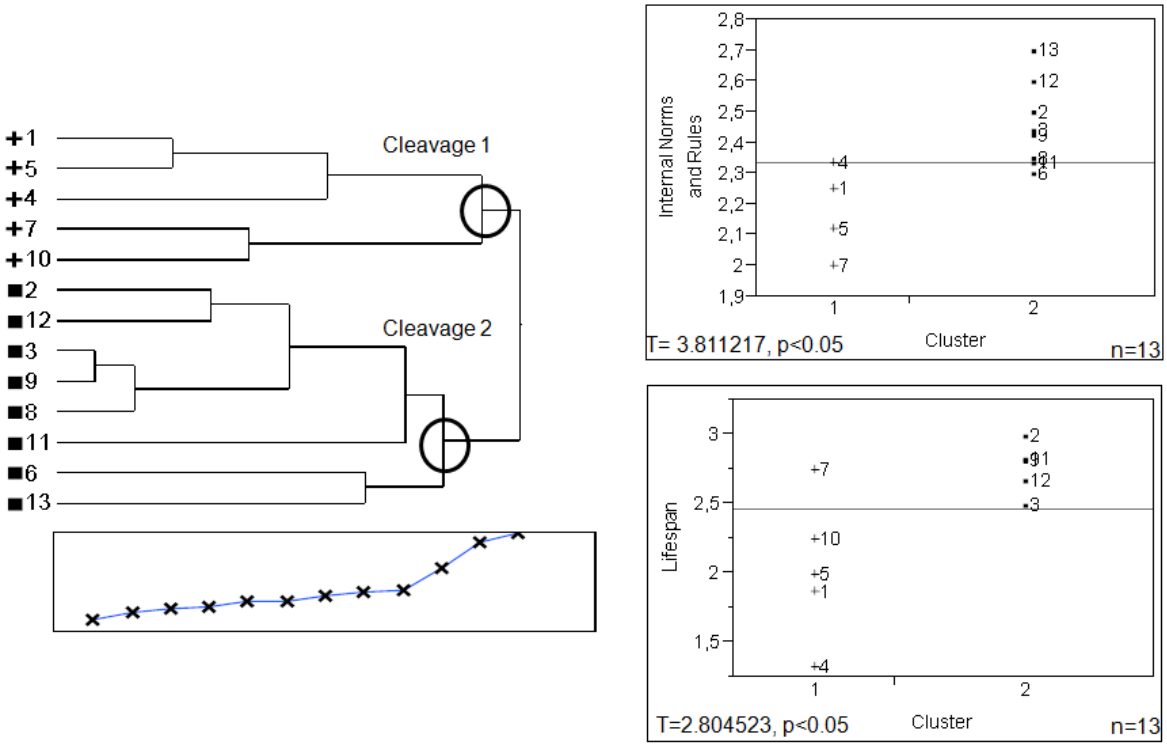

Figure 2-3. Dendrogram of the hierarchical clustering (Ward's method) and t-test.

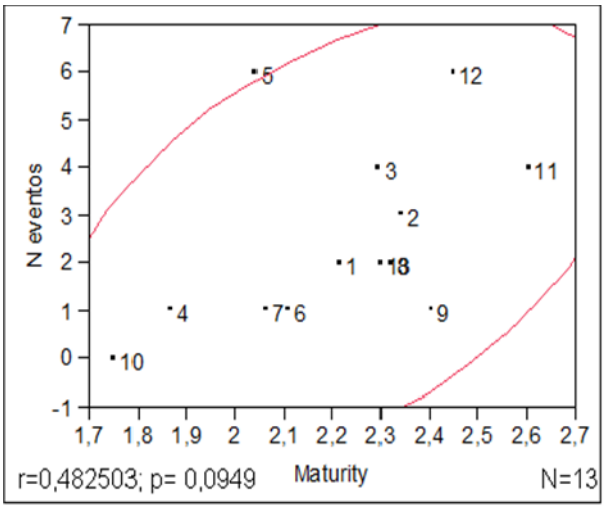

Figure 2-4. Correlation between the number of self-initiated activities and group maturity score

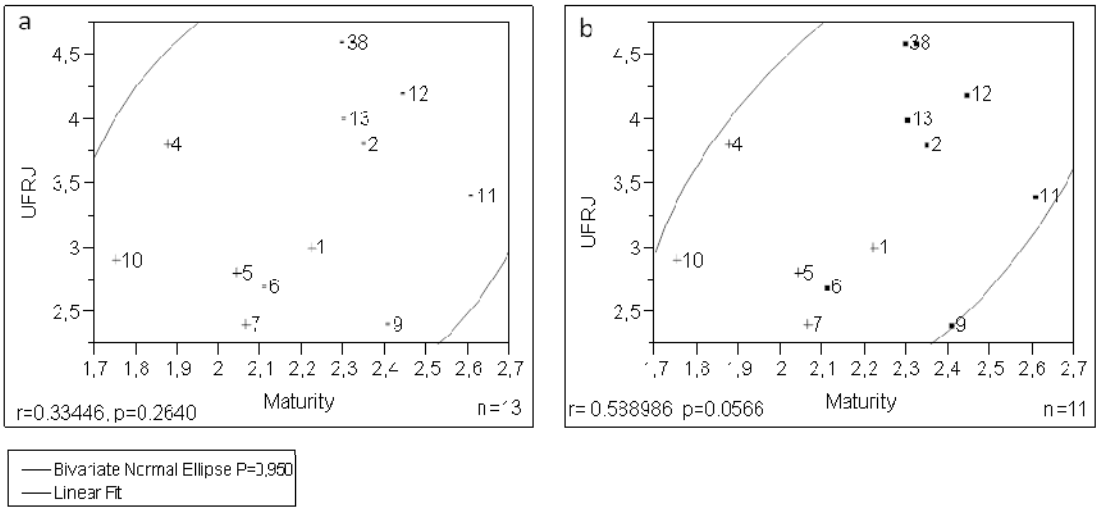

Figure 2-5. Correlation of UFRJ score and group maturity score, using (a) all 13 groups and (b) only 11 groups.

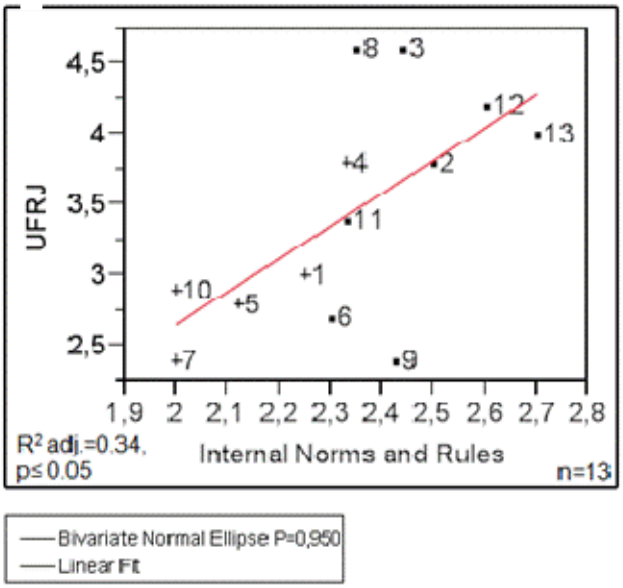

Figure 2-6. Backward stepwise regression of UFRJ score and internal norms and rules (n=13).

CHAPTER 3
CONCLUSION

In this thesis I explored how the internal organization of groups can influence their outcomes. Using a model of group maturity (Pretty & Ward, 2001), I classified the 13 groups formed in the Pólen project context in stages of maturity, which allowed me to identify the main aspects of group internal organization that influences its outcomes. I found that most of the groups are in the intermediary stage of maturity proposed by the model, and that the variables that most influence the group maturity scores are the internal norms and rules, and group lifespan.

The project plan evaluation did not have a significant relation with group maturity scores. I suggest that the technical support given by the UFRJ team to all groups is responsible for confounding which aspects of the plans are attributed to the groups, and which should be attributed to the UFRJ coordinators.

The groups also engaged in a number of self-initiated activities, as a consequence of their involvement with the project. There is a significant relationship between group maturity and number of self-initiated activities. The small numbers of self-initiated activities may have influenced the statistical analysis, and the relationship may be even larger. Some groups participate in activities such as the Environmental Week, presentations and Forum, representing the Pólen group in their municipalities. Some have influenced the creation of legal provisions to guarantee their offices, release time and use of resources. Others are participating in public venues that deal with watershed and protected area management. It is perceived that their participation in these other initiatives is also used as a strategy to gain visibility in the local government, to

guarantee their release time from formal duties, and to avoid attempts of local government control over their activities.

The UFRJ success score was correlated with the maturity scores. This suggests that the external agency evaluation, in this case the UFRJ, is a reliable indicator of group maturity and success. The assessment of group success through interviews with the external agency can be used as an indicator to evaluate groups formed in the scope of public policies and programs, in order to reduce costs of assessment. However, it may only be valid for external agencies that closely accompany groups.

The internal norms and rules variable strongly influenced the UFRJ success score. Assigned tasks seem to be important to groups, once they are meeting and developing their norms and rules, and creating the feel of the group. In this case, the lack of norms and rules in some groups seems to be affected by the lack of assigned tasks. Another important aspect regarding this variable is the lack of self-evaluation, due to a lack of activities conducted by the groups, and a lack of concern to group routine activities. Members' confidence in their group work is another aspect of this variable that is influenced by participants' perception of their own capacity, their acceptance in the communities, and the repercussions of their projects inside the local government.

The other variable that most influenced group maturity is group lifespan, which is influenced by the uncertainty of whether the project will go forward, the repercussion of their work in the municipality, and their ability to solve their internal conflicts.

Group objectives, internal norms and rules, lifespan, external links as well as their institutional context influence members' availability to work, and their willingness to approach or avoid some topics. These variables shape the groups' objectives,

resources needed, as well as the connections they will make in order to obtain these resources.

One suggestion made is to incorporate a temporal perspective into Pretty and Ward (2001) model, in order to acquire a more accurate assessment of group maturity. Recommendations from this study will be useful to the UFRJ team to improve the Pólen project initiative, as well as to enhance other initiatives of education for public environmental management in the oil and gas licensing process.

APPENDIX A
CAPACITY BUILDING STRUCTURE

	Course 1	Course 2	Course 3	Workshop 1	Course 4	Workshop 2	Workshop 3
Event **Courses and workshops**	1. Discussion of the different environmental perspectives of different stakeholders.	1. Premises of the public environmental management.	1. Discussion of oil and gas socio-environmental impacts and the importance of social control.	1.Short term capacity building for civil society representatives	1. Discussion of participatory methodologies, project evaluation and budget constructing to project elaboration.	1.Short term capacity building for civil society representatives	1.Short term capacity building for civil society representatives
	2. Contextual-ization of EE under a social movements, scholastic and ecologic approaches.	2. Oil and gas environmental legislation.	2. Critical reading of the Environmental Impact Assessment of an oil platform.	2. General notions of principles of the public environmental management, and conflict analysis.	2. Discussion of other experiences of projects in response to public policies.	2. General notions of principles of the public environmental management, and conflict analysis.	2. General notions of principles of the public environmental management, and conflict analysis.

	Follow up 1	Follow up 2	Follow up 3	Follow up 4	Follow up 5	Follow up 6	Follow up 7
Follow-up visit	1. Help the elaboration of case studies (identification of social actors and interests regarding an environmental problem).	1. Elaborate a project exercise (involving local partnership).	1. Discuss the project development exercise.	1. Integrate local leaders and participants.	1. Discuss the proposed projects (objectives, methods, and actions).	1. Integrate local leaders and participants.	1. Integrate local leaders and participants.

	Forum 1	Forum 2	Forum 3				
Forum	1. Conflict mapping and assessment discussion (difficulties and challenges).	1. Discussion of the exercise on oil and gas impact mitigation. 2. Discussion of scholastic EE.	1. Discussion of steps to projects development.				
Project elaboration and implementation				1.Beginnin of project development	2.Project development	3.Project development	1. Beginning of projects' implementation

APPENDIX B
INTERVIEW GUIDE: GROUP MATURITY

Themes	Variable	Item	Stages
Worldviews of members	Group objective	What is the objective of the group?	Stage one: The objective of the group is to achieve the goals of the project. Stage two: The objective is achieve the project's outcomes and maybe to develop other complementary activities. Stage three: The objective is to implement the first project, plan a new one and/or expand the first to other areas.
Internal norms and trust			
	Norms and rules	Does the group have rules to organize the collective work in the group?	Stage one: The norms and rules tend to be externally imposed or derived, or group doesn't have rules and norms. Stage two: Member identifies rules and norms only when doing activities . Stage three: Member can identify group's division of labor and norms of functioning in a regular basis.
		Does the group have regular meetings with all members?	Stage one: Group has no meeting. Stage two: There are meetings but with no regularity. Stage three: There are regular meetings.
	Recognition of group value	Do you believe the group's activities will generate changes in the local reality of the municipality, beyond the project impact?	Stage one: Member does not believe the group will change/influence the local context. Member is mistrustful. Stage two: Member is increasingly investing in the group, but not sure if they have potential to change/influence the local context. Stage three: Member believe the group can change/influence the local context, or already recognize changes going on.
		Do you think the group's work will mitigate the social-environmental problems identified in its project?	Stage one: Member doesn't believe the group can reach the project's goals. Member is mistrustful. Stage two: Member is increasingly investing in the group, but not sure if they have potential to achieve the expected outcomes. Stage three: Member believes the group can achieve the project's goals, or already recognizes changes going on. Member is motivated to work.
	Self analysis	Have you ever evaluated the group's work?	Stage one: The group has never evaluated its progress, or only when suggested by the UFRJ's team. Stage two: The group evaluates its progress informally, without any frequency determined. Stage three: The group regularly evaluates its progress.

Themes	Variable	Item	Stage
External links and networks			
	External facilitators	What is UFRJ's role in the group's organization?	Stage one: Group relies on external facilitators to define and sustain its activities. Stage two: New roles for facilitators, such as give technical knowledge support. Stage three: Facilitators no long needed, group is autonomous.
	Horizontal	Do you participate in any non-governmental organization, or network, forum, council, etc?	Stage one: No participation in other organization or forum. Stage two: Participation in one organization or forum. Stage three: Participation in more than one NGO, foundations, associations and/or forums.
		Does the group have representatives of civil society among its members?	Stage one: No contact with the civil society representatives. Stage two: Sporadic relationship with the civil society representatives. Stage three: Civil society representatives embedded in the group, assuming responsibilities as the government functionaries.
		Does the group have partnership with other organizations in the municipality? (Local, regional or national)	Stage one: No links with other organizations in the municipality. Stage two: Link with one organization or forum. Stage three: Link with more than one NGO, foundations, associations and/or forums.
Group lifespan			
	Problem solving	When the group has an internal conflict or disagreement, are you able to handle it?	Stage one: Can't solve its internal conflicts even with the UFRJ mediation. Stage two: Usually relies on help from UFRJ to solve conflict among members. Stage three: The group cab handle its internal conflicts, not needing external mediators.
	Resilience	Do you believe the group will continue existing after this project?	Stage one: Member doesn't believe the group will continue to exist after the first project. Stage two: Member is not sure if the group will persist. It is possible to breakdown after achievements of initial goals. Stage three: Member is confident that the group will persist after the project. Unlikely to breakdown.

APPENDIX C
CRITERIA TO EVALUATE PROJECT PLANS

Criteria

Planning*

1. Does the group define clearly the problem it wants to address?

2. Does the group identify the audience it will work, defining specific groups?

3. Did the group research to know its audience and/or meet the audience needs? #

4. Does the Polo consider local people's input to plan the project before or while project going on? #

5.

   4.1 If the previous answer is yes, what type of input? #

   a. consultation

   b. co-acting

Implementation*

6. Does the group define the specific methodology it will use to reach its objectives?

7. Have they started mobilizing resources, making contacts in the community, or any important aspect of the project elaboration? #

Evaluation*

8. What type of evaluation the group predicted in the written project?
   a. Evaluation of outputs (number of meeting done, percentage of audience reached, number of participants trained)

   b. Evaluation outcomes (if the audience received the message, paid attention, understood and retained the information; changes in attitudes and behaviors.

9. Does the group plan to evaluate the project using:
   a. Quantitative data
   b.
   c. Qualitative data

Maximum Total 9

*The Planning, Implementation and Evaluation answers were yes=1 or no=0; a=0, b=1.

These items were checked during the interviews.

LIST OF REFERENCES

Adcock, R., & Collier, D. (2001). Measurement validity: A shared standard for qualitative and quantitative research. *American Political Science Review, 95*(3), 529–46.

Adler, P. S., & Kwon, S. W. (2002) Social capital: Prospects for a new concept. *Academy of Management Review*, *27*(1), 17–40.

Anderson, C. L., Locker, L., & Nugent, R. (2002). Microcredit, social capital, and common pool resources. *World Development, 30*(1), 95–105.

Adhikari K. P., & Goldey P. (2010). Social Capital and its "Downside": The Impact on Sustainability of Induced Community-Based Organizations in Nepal. *World Development, 38*(2), 184–194.

Andrade, A. L. C de. & Loureiro, C. F. B. (2001). Monitoramento e Avaliação de Projetos em Educação Ambiental: Uma Contribuição para o Desenvolvimento de Estratégias. In: Sato, M.; J. E., Santos. (Org.). *A Contribuição da Educação Ambiental à Esperança de Pandora*. São Carlos: RIMA.

Avritzer, L. (2009). *Participatory Institutions in Democratic Brazil*. Washington, D.C.: Woodrow Wilson Center Press.

Baquero M. (2003). Construindo uma outra sociedade: o capital social na estruturação de uma cultura política participativa no Brasil. *Revista de Sociologia Politica. 21,* 83-108.

Bidegain, P., Bizerril, C., & Soffiati, A. (2002). *Lagoas do Norte Fluminense - Perfil Ambiental*. Rio de Janeiro: Semads.

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.). *Handbook of theory and research for the sociology of education*. New York: Greenwood Press.

Brasil (1981). Lei Federal 6.938/81 – Dispõe sobre a Política Nacional do Meio Ambiente, seus fins e mecanismos de formulação e aplicação, e dá outras providências. Brasília: Diário Oficial da Republica Federativa do Brasil.

Brasil (1988). Constituição da República Federativa do Brasil. Brasília: Centro Gráfico do Senado Federal.

Brasil (1998). Lei Federal 9.605/98 – Dispõe sobre as sanções penais e administrativas derivadas de condutas e atividades lesivas ao meio ambiente, e dá outras providências. Brasília, Diário Oficial da Republica Federativa do Brasil.

Brasil (1999). Lei Federal 9.795/99. Dispõe sobre a educação ambiental, institui a Política Nacional de Educação Ambiental e dá outras providências. Brasília, Diário Oficial da Republica Federativa do Brasil

Brasil (2000). Lei Federal 9.966/00 – Dispõe sobre a prevenção, o controle e a fiscalização da poluição causada por lançamento de óleo e outras substâncias nocivas ou perigosas em águas sob jurisdição nacional e dá outras providências. Brasília, Diário Oficial da Republica Federativa do Brasil

Brasil (2001). Lei Federal 10.257/ 2001. Regulamenta os artigos 182 e 183 da Constituição Federal, estabelece diretrizes gerais da política urbana e dá outras providências. Brasília: Diário Oficial da Republica Federativa do Brasil.

Bryman, A. (2008) *Social Research Methods.*Oxford: Oxford University Press.

Cleaver, F. (2005). The inequality of social capital and the reproduction of chronic poverty. *World Development*, *33*(6), 893–906.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, *94*, 95–120.

Conselho Nacional de Meio Ambiente- CONAMA. (1986). Resolução 01/1986. Dispõe sobre critérios e diretrizes para o Relatório de Impacto Ambiental (Rima).Brasília, Diário Oficial da Republica Federativa do Brasil.

Conselho Nacional de Meio Ambiente- CONAMA. (1987). Resolução 09/1987. Regulamenta as Audiências Públicas.Brasília, Diário Oficial da Republica Federativa do Brasil.

Conselho Nacional do Meio Ambiente – CONAMA. (1997) Resolução 237/ 1997. Dispõe sobre os procedimentos e critérios utilizados no licenciamento ambiental e no exercício da competência, bem como as atividades e empreendimentos sujeitos ao licenciamento ambiental. Brasília, Diário Oficial da Republica Federativa do Brasil.

Curtis, A., Van Nouhuys, M., Robinson, W., & Mackay, J., (2000). Exploring landcare effectiveness using organisational theory. *Australian Geographer, 31*, 349–366.

Dagnino, E. (2002a). Sociedade Civil e Espaços Públicos no Brasil. In: E. Dagnino (Ed.), *Sociedade Civil e Espaços Públicos no Brasil*, São Paulo: Paz e Terra.

Dagnino, E. (2002b) Sociedade Civil, Espaços Públicos e Construção Democrática no Brasil: Limites e Possibilidades. In: E. Dagnino (Ed.), *Sociedade Civil e Espaços Públicos no Brasil*, São Paulo: Paz e Terra.

Eastis, C. (1998). Organizational Diversity and the Production of Social Capital: One of These Groups is not Like the Other. *American Behavioral Scientist*, *40*(6), 547-678.

Edwards, B., & Foley, M, W. (1997). The Political Economy of Our Discontent. *American Behavioral Scientist*, *40*(6), 669-678.

Feldman, D. C. (1984). The development and enforcement of group norms. *Academy of Management Review*, *9,* 47-53.

Fetterman, D. M. (1994). Empowerment evaluation. *Evaluation Practice, 15*(1),1-15.

Foley, M., & Edwards, B. (1999). Is it time to disinvest in social capital? *Journal of Public Policy*, *19*(2), 141– 173.

Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). Adaptive governance of social-ecological systems. *Annual Review of Environmental Resources, 30(*8),1-8.

Freire, P. (1987). *Pedagogia do oprimido*. 17. ed. Rio de Janeiro: Paz e terra.

Gersick, C.J.G. (1988). Time and transition in work teams: Toward a new model of group development. *Academy of Management Journal*, *31*, 9-41.

Gersick, C.J.G., & Hackman, J.R., (1990). Habitual routines in task performing groups. *Organizational Behavior and Human Decision Processes*, *47,* 65-97.

Glasson, J., & Salvador, N. (2000). EIA in Brazil: a procedures–practice gap. A comparative study with reference to the European Union and especially the UK. *Environmental Impact Assessment. Review, 20,* 191–225

IBAMA (2005) Coordenação Geral de Educação Ambiental – CGEAM. Orientações Pedagógicas do IBAMA para a Implementação de Programas de Educação Ambiental no Licenciamento de Atividades de Produção e Escoamento de Petróleo e Gás natural. (Anexo ao Termo de Referência para Licenciamento Ambiental das Atividades de Produção e Escoamento de Petróleo e Gás Natural). Brasília.

Jacobi, P.R., & Monteiro, F. (2006) Social capital and institutional performance: methodological and theoretical discussion on the water basin committees in metropolitan São Paulo- Brazil. *Ambiente & Sociedade*, *9*(2), 25-45.

Jacobson, S. K. (2009). *Communication skills for conservation professionals*. Washington, DC.: Island Press.

Jehn, K. A.(1994). Enhancing effectiveness: An investigation of advantages and disadvantages of value-based intra group conflict. *International Journal of Conflict Management, 5,* 223-238.

Jehn, K. A., & Mannix, E.A. (2001). The dynamic nature of conflict: A longitudinal study of intragroup conflict and group performance. *Academy of Management Journal*, *44*, 238–251.

Jehn, K.A., & Shah, P. (1997). Interpersonal relationships and task performance: An examination of mediating processes in friendship and acquaintance groups. *Journal of Personality and Social Psychology*, *72,* 775- 790.

Layrargues, P. P. (2000). Educação para a Gestão Ambiental: a Cidadania no Enfrentamento Político dos Conflitos Socioambientais. In: Layrargues, P. P. (Ed.) *Sociedade e Meio Ambiente*. São Paulo: Corteza.

Lin, N. (1999). Building a network theory of social capital. *Connections, 22*(1), 28-51.

Loureiro C.F.B. (2009). Educação Ambiental no Licenciamento: aspectos legais e teóricos-metodológicos. In: C.F.B. Loureiro (Ed.) *Educação ambiental no contexto de medidas mitigadoras e compensatórias de impactos ambientais: a perspectiva do licenciamento*. Salvador: Instituto do Meio Ambiente.

Loureiro, C.F.B., & Anello, L. (2009). A construção de uma proposta do IMA de educação ambiental no licenciamente e fiscalização de atividades poluidoras: um breve relato. In: C.F.B. Loureiro (Ed.) *Educação ambiental no contexto de medidas mitigadoras e compensatórias de impactos ambientais: a perspectiva do licenciamento*. Salvador: Instituto do Meio Ambiente.

Marsico, J. (2008). Petróleo e Gás na Bacia de Campos (RJ): Percepção dos Impactos Ambientais pela População. Master Thesis. Federal University of Rio de Janeiro.

Molyneaux, M. (2002). Gender and the silences of social capital. *Development and Change, 33*(2), 167–188.

Moraes, M.S.M. (2004). O loteamento do mar: conflito e resistência. In: H. Acselrad (Ed.) *Conflito Social e Meio Ambiente no Rio de Janeiro*, Rio de Janeiro: Relume Dumará.

Oh, H., Chung, M., & Labianca, G. (2004). Group social capital and group effectiveness: The role of informal socializing ties. *Academy of Management Journal*, *47,* 860–875.

Paxton, P. (2002) Social capital and democracy: an interdependent relationship, *American Sociological Review*, *67,* 254–277.

Portes, A. (1998). Social capital: its origins and applications in modern sociology. *Annual Review of Sociology*, *24*, 1–24.

Portes, A., & Landolt, P. (2000). Social capital: promises and pitfalls of its role in development. *Journal of Latin American Studies*, *32,* 529–547.

Pretty, J., (1995). Participatory learning for sustainable agriculture. *World Development 23*(8), 1247–1263.

Pretty, J., & Ward, H. (2001). Social capital and the environment. *World Development*, *29*(2), 209–227.

Projeto Pólen (2006). Relatorio de Atividades Semestral: Diagnostico Socioambiental dos Municipios da Bacia de Campos. Rio de Janeiro: Laboratorio de Limnologia, NUPEM/UFRJ.

Projeto Pólen (2007). Relatorio de Atividades Semestral: Janeiro a Junho 2007. Rio de Janeiro: Laboratorio de Limnologia, NUPEM/UFRJ.

Projeto Pólen (2008). Relatorio de Atividades Semestral: Julho a Dezembro 2008. Rio de Janeiro: Laboratorio de Limnologia, NUPEM/UFRJ.

Putnam, R. D., Leonardi, R., & Nanetti, R. (1993). *Making democracy work: Civic traditions in modern Italy*. Princeton: Princeton University Press.

Quintas, J. S. (2006). *Introdução à Gestão Ambiental Pública. Série Educação Ambiental*, Coleção Meio Ambiente. 2nd edition. Brasília: Ibama.

Rulke, D. L., & Galaskiewicz, J. (2000). Distribution of knowledge, group network structure, and group performance. *Management Science*, *46*(5), 612–626.

Serra, R. (2007) Concentração Espacial das rendas petrolíferas e sobrefinanciamento das esferas de governo locais. In: R. Piquet & R.Serra (Eds.), *Petroleo e Região no Brasil. O Desafio da Abundância*. Rio de Janeiro: Garamond Universitaria.

Serrão, M., Walter, T., & Vicente A.S. (2009). Educação ambiental no licenciamento – duas experiencias no litoral baiano. In: C.F.B. Loureiro (Ed.) *Educação ambiental no contexto de medidas mitigadoras e compensatórias de impactos ambientais: a perspectiva do licenciamento*. Salvador: Instituto do Meio Ambiente.

Shah, P., & Jehn, K. (1993). Do friends perform better than acquaintances? The interaction of friendship, conflict and task. *Group Decision and Negotiation*, *2,* 149-166.

Tatagiba, L. (2002). Os Conselhos Gestores e a Democratização das Políticas Públicas no Brasil. In: E. Dagnino (Ed.), *Sociedade Civil e Espaços Públicos no Brasil*, São Paulo: Paz e Terra.

Thorp, R., Stewart, F., & Heyer, A. (2005). When and how far is group formation a route out of chronic poverty? *World Development*, 33(6), 907–920.

Tuckman, B.W. (1965). Developmental sequences in small groups. *Psychological Bulletin, 63,* 384-399.

Uema, B. (2009). Controle Social, Saber Perito e Participação. In: C.F.B. Loureiro (Ed.) *Educação ambiental no contexto de medidas mitigadoras e compensatórias de impactos ambientais: a perspectiva do licenciamento*. Salvador: Instituto do Meio Ambiente.

UNESCO-UNEP (1978) The Tbilisi Declaration, *Connect*, *3*(1), 1-8.

Upton, C. (2008). Social Capital, Collective Action and Group Formation: Developmental Trajectories in Post-socialist Mongolia*. Human Ecology, 36*(2), 175–188.

Westermann, O., Ashby, J., & Pretty, J. (2005). Gender and Social Capital: The Importance of Gender Differences for the Maturity and Effectiveness of Natural Resource Management Groups. *World Development, 33*(11), 1783–1799.

Zander, A. (1979). The psychology of group processes. *Annual Review of Psychology*, *30*, 417-451.

BIOGRAPHICAL SKETCH

Ana Carolina was born in Rio de Janeiro city, Brazil, where she grew up. In 2006 she received a Bachelor's in Science in Ecology at the Federal University of Rio de Janeiro. From 2006 to 2008 she worked as a technician at the Federal University of Rio de Janeiro, where she was part of a team that developed and implemented the Pólen Project, an environmental education program in the oil and gas licensing process. She used the Pólen Project as a case study in her master's research, in which she focused on group dynamics and its importance to group success. Ana Carolina concluded her master's in the Center of Latin American Studies, with tropical conservation and development concentration in the spring 2010.