

# RELATIONS OF VARIOUS SOCIAL ACTORS WITH MARINE DEBRIS IN THE MUNICIPALITY OF CANANEIA, SP<sup>1</sup>

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## 1 Introduction

Carrying out a participatory environmental diagnosis makes it possible to identify the way the participants view the world in question. Tassara and Ardeans (2007) consider that a diagnosis has two dimensions: the identification of the natural and social causes that led to the situation to be addressed; and the identification of the respective (ethical, political and esthetic) judgments and ideologies. Tozoni-Reis (2005) proposes that the aim of participatory methodology is to share knowledge and ensure that the persons in the group stop being mere research objects and become active participants in the research insofar as the methodology propitiates moments of reflection and understanding of the socioenvironmental reality, all of which contributes towards achieving social transformation (OLIVEIRA, 2012). In turn, Di Tullio (2014) considers that for a diagnosis to be participatory it must involve dialogue which, together with a process of reflection, can make socioenvironmental transformation feasible

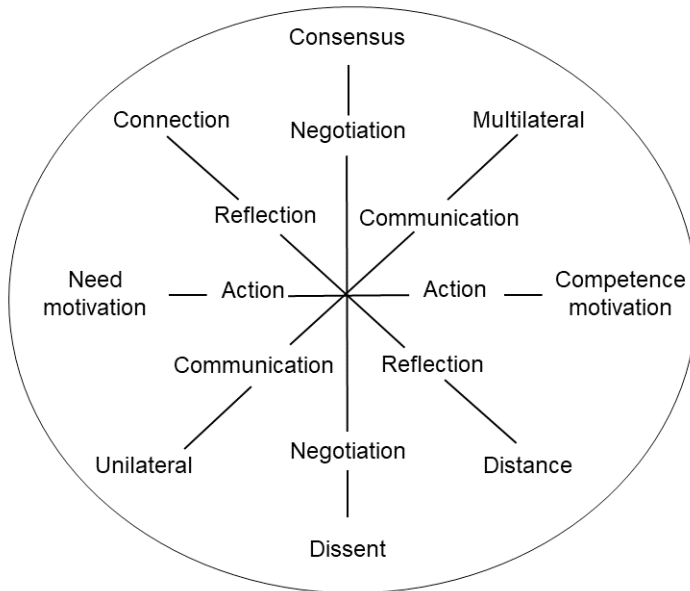
The principle of Participatory Action Research (PAR) is based on the concepts of Paulo Freire (1992; 1983) insofar as it questions traditional educational approaches and the traditional organization of decision-making processes. Furthermore, the participants' involvement with regional environmental issues propitiates the emergence of a feeling of territorial belonging and favors reflection on the relations between society and nature. Some of the research work was undertaken in the perspective of critical environmental education which, according to Carvalho (2004), seeks to qualify persons capable of identifying socioenvironmental problems and taking action to solve them.

The concepts of social learning and the processes for solving problems experienced in common expounded by Wildemeersch (2009) formed the basis for the discussion developed in this study. That author identifies four dimensions of social learning, namely:

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action, reflection, communication and negotiation and to each one he adds opposing poles, introducing moments of either tension or fluidity (Figure 1).

**Figure 1 - Dimensions and tensions involved in social learning according to Wildemeersch (2009).**



Source: Wildemeersch (2009) adapted from Formenton (2018).

1) Action: direct connection between social learning and social action; the opposing poles are the origin of the action initiative which can be set in motion by a sporadic demand ('need motivation') or by the existence of a set of competences ('competence motivation')

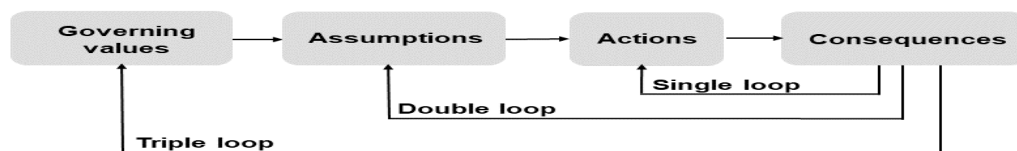
2) Reflection: processes of reflection may occur within or outside of the social system. One of the poles is 'distance' and the other is 'connection'.

3) Communication: learning is connected to communication or to the lack of it and in this context the opposing poles are 'unilateral' communication processes and 'multilateral' ones.

4) Negotiation: divergent interests require negotiating processes and the mediation of the divergences may occur in situations of either 'consensus' or 'dissent' or even within the scope of a formal agreement.

The concepts of participation and engagement that Dyball et al. (2007) proposed also contributed support for the analyses. Those authors state that there is never only a single possible solution for achieving sustainability based on a single set of knowledge given that different relations between people and places integrate each environmental context and they also point out that learning may occur in the form of a single, double or triple loop (figure 2).

**Figure 2 - Three loops in which social learning may take place according to Dyball et al. (2007).**



Source: Dyball et al. (2007) adapted from Formenton (2018).

'Single loop' learning, according to Dyball et al. (2007), refers to the development of skills, practices and actions within the sphere of a team, whereas 'double loop' learning involves the analysis of the bases and fundamentals that lead to broad actions and the relations that need to be established between or among groups in order to achieve a solution for the problem. In turn, 'triple loop' learning fosters reflection and changes in more complex values and norms associated, for example, to actions and participation in the spheres of public policy and administration and therefore capable of bringing about effective changes in environmental management.

The same authors consider that the sustainability of any human environment inevitably involves a social learning process, albeit the origins of environmental conflicts present their own specific challenges to the achievement of that learning. They add that managing environmental problems requires cooperation among various groups occupying different levels, including individuals, communities, experts and government. That view is one of the bases of critical environmental education and, therefore, this study assumes that the principles of PAR, social learning and critical environmental education maintain a coherent articulation with one another. In other words, PAR proposes the formation of a social learning network in which the identification, problematization and solution of socioenvironmental challenges take place on the basis of community engagement.

## Contextualization

Currently, about 12 million tons of waste are discharged into the oceans every year (JAMBECK et al., 2015). According to a dossier compiled by (DERRAIK, 2002), plastics make up 80 to 90% of all marine debris, threatening marine biodiversity, and, together with other anthropic impacts, they are leading to the extinction of many species. There is evidence of the presence of solid waste in all the world's oceans, even many miles away from the nearest urban centers (LAW, 2010). Human use of rubber and natural resins dates back to the 1600 AD but the manufacture of polymer plastics only began in the 19<sup>th</sup> century (ANDRADY; NEAL, 2009). Thompson et al. (2009) state that plastics have brought much progress and quality of life to humanity given that their use is simple, accessible and widespread. However one of the consequences of mismanagement or failure to manage their residues is marine pollution.

Brazil is in 16th position in the ranking of countries that most pollute marine waters (JAMBECK et al., 2015). Brazil has more than eight thousand kilometers of coastline and 26.6% of the Brazilian population lives in the coastal zone (IBGE, 2011) which is endowed with important ecosystems such as mangrove swamps and estuaries, in addition to a rich marine biodiversity (MMA, 2010). Ivar do Sul and Costa (2007) have compiled a report on the impacts of marine debris on the Brazilian coastal environments and fauna and there are other studies registering the impacts stemming from marine debris around the world (BERGMANN et al., 2015). Gall and Thompson (2015) compiled data extracted from 340 publications and concluded that 693 marine species have suffered the impacts of marine debris. The ingestion of solid waste material by the marine biota has direct consequences for the survival of the respective organisms and also interferes with the marine food chains (WRIGHT et al., 2013; KÜHN et al., 2015). Added to that there is the impact of the usually fatal entanglement of individual creatures in the remains of lost or discarded fishing nets known as phantom nets which continue capturing organisms but no longer contributing anything to human consumption (ERIKSEN et al., 2014). One of the estimates of the quantity of residues present in the oceans considers that there are 5.25 trillion micro-plastic particles floating in the ocean weighing about 268,940 tons in all (ERIKSEN et al., 2014).

Thus marine debris is one of the main sources of negative impacts on marine biodiversity and the impacts extend to fishing, navigation, the economy, and human health and safety (GALL; THOMPSON, 2015). For decades solid waste disposal has been relegated to the sphere of municipal policies that have not even considered environmental aspects, regarding the seas as a kind of dump site. Ivar do Sul and Costa (2007) underscore the fact that only recently has the question of solid waste in the marine environment become addressed as a scientific issue. Nevertheless, the question is not sufficiently acknowledged by the population at large and in various countries there are no management programs in place to take action in the face of the tremendous impacts involved (ROCHMAM; BROWNE, 2013). Against that background, Logarezzi (2006) underscores the importance of environmental education in regard to waste disposal as part of a broader process of developing capacity for critical analysis, leading to emancipation and the consequent personal connection of individual and collective actions.

The town and municipality of Cananeia lie at the southern end of the coastline of the State of Sao Paulo and the beaches in the region display a considerable amount of marine debris (BEVILACQUA et al., 2011). Some studies have been conducted there regarding the impacts of marine debris on marine turtle species (BEZERRA, 2014). The main source of income for Cananeia and other municipalities in the region are fishing and tourism and those depend on the quality of the fisheries and of the natural environment (MENDONÇA, 2007).

Ferraro-Junior (2007) considers it essential that there should be some possibility of working with themes that are related to the participants' own contexts so that they will be able to interact with the themes. According to Freire (2005), teaching by means of 'generating themes' transcends the mere basic understanding of the words because the topics have a place in everyday life. In turn, Costa and Pinheiro (2013) state that

the subject matter is not there just to be learned but rather to be lived and reflected on. Given all the above considerations, this study set out to analyze the participatory process and the social learning that occurred in the course of the socioenvironmental diagnosis that was carried out. To that end it describes how the investigation was unfolded and gives details of the analyses that were made based on the statements and joint reflections of the researcher and the participants.

## 2 Methodological Procedures

Cananeia is part of the largest remaining stand of Atlantic Forest vegetation formation and UNESCO has classified it as an 'Atlantic Forest Biosphere Reserve' since 1991. In 1999 the region was awarded Human Natural Heritage status (UNESCO, 2012) and it is part of a mosaic of more than 20 protected areas in different conservation categories (ICMBIO, 2006). The researcher has taken part in some of the various forums addressing environmental themes and has observed that in them the aspect of marine debris and its impacts on the environment and the biota are treated in a very superficial and/or sporadic manner.

The proposal to undertake research on this particular theme and with the groups in question arose from the fact that the first author had previously been involved in community research in the respective municipality, which, coupled to the prior observation of the generalized lack of depth in approaching the issue and the fact that it caused considerable uneasiness in certain segments of society, led to the design of the present research project. Subsequently certain groups susceptible to involvement with the question were defined for the purpose of performing a participatory environmental diagnosis designed to construct knowledge on the basis of the community's effective involvement during the educational process.

Accordingly, people who agreed to participate in the interaction were invited to compose the six groups, namely: primary and lower secondary education teachers, selective waste collection cooperative members, members the fishermen's union, staff from the Municipal Environment Department, teachers and members of the Residents Association of Community 1 and Community 2. According to Dyball et al., (2007), it is important to realize that different groups and social actors view problems they have in common in different ways and, furthermore, that those different actors have different power bases. Therefore the decision was made to invite groups with different power bases to ensure that the study would be made up of multiple visions. The study proposal was presented and explained to each group separately and they agreed and duly signed a term of informed consent.

The meetings for the construction of the participatory diagnosis were held in the period from April 2015 to March 2016 and number of meetings per group varied from one to five (Chart 1) with each meeting lasting two hours on average. They took place in the groups' headquarters and some even took place in participants' homes. Different groups require different meeting dynamics in regard to the number of meetings needed and the data gathering dynamics and so the research questionnaire served mainly as a

guideline for reflecting on the theme and constructing the diagnosis. At each meeting a semi-structured questionnaire elaborated by the researcher was administered to everyone in the respective group to which they responded and then a discussion of marine pollution ensued. Next, the researcher showed a selection of slides to underscore and exemplify certain points, illustrating the theme locally and around the world with the intention of propitiating a broader vision of the problem of marine pollution in the local and global spheres

The process was finalized with a meeting designed to share the diagnosis, stimulate a collective discussion and propitiate the construction of interactions among the groups. That meeting was attended by at least one representative of every group. The researcher's cell phone was used for all the audio recordings which were later transcribed<sup>4</sup>. As part of the data analysis, a triangulation of the entire research *corpus* was carried out (Chart 1).

**Chart 1 - Systematization of the participating groups, numbers of persons, dates of meetings and research *corpus*.**

Groups	Number of participants	Meetings	Research <i>Corpus</i>
Teachers	5	13/04/2015 28/04/2015 18/05/2015 26/05/2015 08/06/2015	Questionnaires Audio recordings/Photos
Selective collection cooperative	5	10/10/2015	Audio recordings and photos of the meetings
Fishermen's union	2	14/11/2015	Audio recordings of the meetings
Residents Association Community 1	10	03/09/2015 21/11/2015	Questionnaires Children's drawings Audio tapes/Photos
Residents Association Community 2	9	01/10/2015 31/10/2015	Audio recordings of the meetings/Photos
Environment Department	2	18/12/2015	Audio recordings of the meetings
Sharing feedback	9	13/04/2016	Photos

Source: elaborated by the author.

### 3 Results and discussion

Based on the triangulation of the data gathered from the questionnaires and meetings the results were grouped under five topic headings (Chart 2) according to the similarities revealed among contents and the reflections.

4. All aspects of the research, including audio recordings, photographs and the publication of the gathered data were duly authorized by every one of the participants.

**Chart 2 - Topic headings based on the similarities among the statements and reflections.**

Topics
I – Retrieval of activities related to marine debris/debris.
II – Resignification of concepts.
III – Identification with the marine environment.
IV – Perception of and responsibility for impacts.
V – Surprises along the way.

Source: elaborated by the author.

Each of the above topics will be presented and discussed below to demonstrate the aspects that emerged and the consonances and differences among the ideas addressed:

**I) Retrieval of the activities undertaken in regard to marine debris**

The first step of the participatory diagnosis was to recall and register those actions the groups had previously carried out in regard to marine pollution and marine debris management in the region (Chart 3).

**Chart 3 - Retrieval of the prior activities of the groups directly linked to the question of marine debris and waste management.**

Group	Activities	Participants
Primary and lower secondary education teachers	Point for selective waste collection.	Students and neighborhood residents. 80 students.
Fishermen's Union	Informative folder for fishermen informing decomposition times for debris in the sea.	Around 600 union-registered fishermen.
Residents Association Community 1	Beach-cleaning actions throughout the year.	15 people per action on average
Residents Association Community 2	Making use of used fishing nets in artisanal clothing items. Beach-cleaning actions.	About 15 community members.
Selective Waste Collection Cooperative	Helping in beach-cleaning actions.	Around 5 members
Environment Department	Helping in beach-cleaning actions.	Providing snacks for the volunteers and supporting the collection routine.

Source: elaborated by the author.

In addition to the retrieval of past actions, attention of all the groups was drawn to the importance of registering all the activities they carried out given that such systematization produces a historical record and incentive for new actions to be undertaken. In that context the groups reflected on the actions previously carried out and concluded that they had indeed addressed the issue even if it had not been in a direct and continuous manner. The group of members of the Residents Association Community 2 was in the course of carrying out an action related to the theme insofar as they were using pieces of fishing nets they had collected from the beaches or which fishermen had given them to decorate handicraft items they created. Thus the group was already aware of the impacts of marine debris and had actually conceived a beneficial decorative use for the material that could also potentially arouse awareness in others when the items were sold.

In the same context, all the participants showed that they were disposed to carry out other initiatives directly related to the question of marine debris. During the meetings the groups' representatives cited examples of practical actions that could be carried out in the region such as increasing the frequency of collective beach cleaning actions. The quotes below reveal the opinions of some of the participants in regard to the actions directed at the marine debris problem:

*"Environmental education yes, but specifically addressing marine debris... sometimes, but very rarely"* (J - Professor).

*"The Union has helped in the beach cleaning but there is a lack of a specific work [project]"* (W - Fishermen's Union).

*"Yes, we do talk about pollution and marine pollution, in lectures, but there is no specific municipal program. The actions are sporadic"* (A - Environment Department).

*"Prior to the project we used to make an imitation of a piece of fishing net; as the community's livelihood is fishing, we used that in the pieces we created. As we evolved further we realized that it would be possible to work with this material that harms the environment. There are lots of abandoned nets and we have not heard of... we do not know of anybody that re-uses them, so we thought it would do for us to use in our creations"* (T - Community 2).

## II) Resignification of concepts

Carvalho (2006) proposes that there are three dimensions to the education process: knowledge; ethical and esthetic values; and participation and citizenship. They are not hierarchical in relation to one another and it was possible to recognize the construction of knowledge and the resignification of concepts that occurred in the course of the discussions as being a step in the educational process that the theme propitiates given that the ethical values associated to marine debris and questions related to participation and citizenship were readily observable in the participants' reflections. Thus the discussion



concerning the use of disposable items, consumer habits and solid waste disposal fostered significant dialogues as the excerpt below clearly illustrates:

*“Girl, wouldn’t the right thing be to burn it all? I didn’t have this vision that the girl described before. I have learned a lot from these meetings. I began to learn when I came to live here”* (B - Selective Waste Collection Cooperative).

Freire (1983) proposes the concept of “ingenuous consciousness”, characterized by a reductionist attitude in regard to the recognition of complex problems and usually associated to replicating attitudes rather than questioning them. To oppose that Freire puts forward “critical consciousness” which operates a more complex assessment of issues. Similarly, Blauth et al. (2006) analyze the pro-waste myths, the erroneous ideas and concepts that exist associated to the intention of ‘minimizing waste’, as being replicated without due reflection. Knowledge construction and deconstruction processes are necessary and certainly the object of critical environmental education is not to work in a perspective of dichotomizing scientific knowledge and popular knowledge, theory and practice or knowledge and action (GUIMARÃES, 2004).

It is worth underscoring the fact mentioned at the beginning of this article that negative interactions with marine pollution have been registered for at least 693 species (GALL; THOMPSON, 2015).

*“Turtles actually eat this kind of transparent plastic because they mistake it for the jelly-fish they normally eat”* (F - Selective waste collection cooperative).

In that light this research endeavored to propitiate moments for the construction of knowledge on the part of the researcher and the participants given our conviction that critical environmental education takes pace in a social learning context. The group discussed new concepts put before them and their reflections on them made it possible to attribute new significance to knowledge and values.

### III) Identification with the environment

Investigations conducted in different contexts with different audiences using different data gathering techniques have identified the multiplicity of meanings that are attributed to biodiversity (VALENTI, 2010; THIEMANN; OLIVEIRA, 2013). In consonance with those investigations, the participants in this study presented different visions of, and relations with marine biodiversity:

*“All the species suffer because the pollution alters the ecosystem and the habitats in the food production chain”* (J - Teacher).

*“I could actually feel it with my own hands... you open the creature and it is full of rubbish. It’s very sad”* (A - Environment Department).

*“[The sea] is our life. Not only with the fishing work but also in the work with public visitation, the marine aspect is our means to survival. We survive and live; when anything changes, we notice it right away” (S - Fishermen’s Union).*

*“It’s practically everything, from it we survive, that’s where all the creation is. Fishing used to be our livelihood but nowadays it’s tourism and we need the environment to be clean for our survival. Fresh, seeing the dolphins, that’s the environment that portrays everything in our lives... And it is best to have that environment clean and preserved. Nowadays we no longer live from fishing but we still eat the fish from here” (J - Community 1).*

The last two transcriptions show how participants from different groups address their own particular dependence on the marine environment whether it is the direct need of the fisherman to catch his food or of the traditional regional coastal community members who engage in community tourism activities. It is important to underscore the fact that even members of other groups spoke of how important the sea was for the municipality, including the use of fishery resources and tourism activities.

That idea of dependence is analogous to the humanist categorization made by Sauv e (2006) whereby the environment is seen as if it were a livelihood. Indeed, the perception of the environment as a livelihood, as a source of resources, is not only holistic but it is also consistent with the complex approach that critical environmental education calls for.

One of the aspects of social learning delineated by Wildemeersch (2009) is negotiation and the respective opposing poles are ‘consensus’ and ‘dissent’. The data obtained by the present study reveal a consensual vision in regard to anthropic interference in marine life and the urgent need to propose mitigation actions. The ‘unilateral’ aspect of communication was considered to have been one of the process’s successes insofar as the participants were active subjects in all the meetings. An analysis of the reflection associated to the poles of ‘distance’ and ‘connection’ identified connection between the participants and the themes; the latter aroused the participant’s curiosity and interest insofar as they made sense in the local reality given the ready visualization of marine debris in the region.

Carvalho (2004) states that critical environmental education is based on the relation between social change and environmental change and thus effectuates a resignification of care for nature and for other human beings. The interviewees expressed their empathy with the marine species and, due to their living in such close proximity to the marine environment, they were able to relate various relevant experiences of their own or of friends and relatives. That particular feature of the local context is identifiable with another aspect of social learning: the action aspect, related to ‘competence motivation’ and ‘need motivation’ (WILDEMEERSCH, 2009). The invitation extended by the researcher triggered motivation insofar as she delineated a need but from there on the motivation stemmed from the competences that existed in the groups, given that the respective problems were totally inserted in the local population’s everyday life.

#### IV) Perceptions of and responsibility for the impacts

According to the guidelines of the Treaty on Environmental Education for Sustainable Societies and Global Responsibility (RIO DE JANEIRO, 1992), educational practices should address such complex problem in a systemic perspective taking account of their respective historical and social contexts. Carvalho (2004) states that critical environmental education seeks to qualify an ‘ecological subject’ concerned about, and sensitive to social and environmental issues and capable of recognizing problems, planning strategies, and implementing actions. To that end, understanding all the problems involved right from the production chain through to questions associated to residue disposal is of significant importance in the construction of critical thinking and the ability to duly substantiate choices and attitudes. Logarezzi (2006) declares that any approach to such complex themes as waste management and consumption must be made with the “greatest possible clarity” in regard to concepts insofar as clear understanding enables us to become aware of, and assume our responsibility to reduce the respective impacts. In that light the groups that were interested in the local and global information introduced by the researcher addressed the theme offering and sharing practical examples:

*“At first people used to sweep the yard and pile the rubbish up around the base of the tree as if it were some kind of fertilizer. When we were children, it was great fun for us to go to the beach and see what the tide had brought in... toys, shoes, search for missing pair of a shoe, we loved it. Children had a lot of fun” (J - Community 2).*

*“This very day a couple declared that they had stopped visiting the beach because a lot of rubbish was beginning to appear. If we manage to keep it clean here, that kind of thing will not happen” (J - Community 1).*

The dialogue regarding the origins of the impacts made the participants thoughtful as to whether they should distinguish their approaches regarding the “waste from the city” and the “waste in the sea” but eventually they decided that the city could be the origin of the waste present in the sea and on the shore. During the discussions they also addressed the question of marine pollution as stemming from the excessive consumption of products and the inadequate disposal of the respective solid residues and their consequent presence in the waters and the rivers that carried them out into the seas. The fishermen’s group pointed out that part of the debris is discharged directly into the water.

Thus, based on their reflections and a systemic vision of the set of problems addressed, the participants were able to understand their complexity. The following excerpts of their statements show some of the opinions and reveal how the question of the origin of the marine debris was dealt with:

*“The main source of debris in the sea is the city” (A - Environment Department).*

*“[The debris] comes from the city, from the community itself and from the fishing vessels” (J - Community 2).*

*“But the debris that we get here is probably not from Cananeia at all. Over by the river there is a lot of rubbish. Our region here is a kind of cove in the state of São Paulo. This is a geographic space and the curve of the cove makes it accumulate a lot of material. The ocean currents favor the accumulation of waste material” (S - Fishermen’s Union).*

Communities 1 and 2, in particular, stated that there were three sources of debris: 1) waste produced by the communities themselves; 2) litter left behind by tourists; 3) debris brought in by the ocean currents. That led to a discussion as to what the different management strategies should be for each one of those sources. Accordingly, the discussions and reflections that took place during the course of the meetings propitiated a very broad vision of the problems associated to marine debris, based initially on the local sphere but expanding to embrace the entire Brazilian territory and even the global sphere, in alignment with the systemic perspective indicated by the Treaty on Environmental Education for Sustainable Societies and Global Responsibility (RIO DE JANEIRO, 1992).

As mentioned above, some authors underscore the problem of the failure to acknowledge the question of marine debris as a global environmental problem that calls for far greater efforts and programs and public policies duly adapted to each context. Fernandes and Sansolo (2013) investigated the environmental perceptions of residents of a beach in the state of São Paulo state in regard to marine debris and showed that the participants in their research acknowledged that part of the debris stemmed from the beach-users themselves. At the end of the set of meetings all the participants agreed that marine debris is indeed an important, complex environmental problem awaiting solution because the latter depends on various different segments of society. Those aspects also permeated the present research project and the statements set out below reveal the importance of the groups’ autonomy and, at the same time, demonstrate the need for other groups/sectors to act in or generate the construction of strategies to face the issue:

*“The human being is responsible; it’s no use trying to blame the government, even though education is in fact part of government” (S - Fishermen’s Union).*

*“I believe that it should begin with a data gathering process on which to base the classes and there should be a survey of the information that the students have and awareness raising work done so that the child can become a multiplier. And in regard to the city hall and other responsible bodies, there should be sporadic actions unfolded so that the students can see that the work done or subjects spoken about in the classroom are being followed up on by the respective administrative bodies; so that the population can see that this concern is general and not merely on the part of some people” (R - Teacher).*

In regard to responsibility for urban waste and marine debris management, the groups did not identify any single group or sector but instead, considered it to be a task for all citizens. Based on the visualization of autonomy on the part of the groups, it proved possible to speak of partnerships, given that the groups had referred to shared management and so each group was able to reflect on how to take action in regard to the theme in their everyday lives. Joint actions and those involving various sectors are more effective and even more so when they address complex problems that have a variety of origins (UNEP, 2009; NOAA, 2013). The following excerpts from the transcriptions show that the participants had already engaged in partnership arrangements and now realize that new joint actions are an important means to diminishing impacts and endowing management processes with greater fluidity:

*“The first step is raising awareness. There was a group of people that came here and “S” (Community 1 participant) always goes from table to table telling people that they must take any litter they produce here back with them. There was one guy who said the boatman had already told them that and the litter had already been separated. We should give that boatman a round of applause” (E - Community 1).*

*“An important step would be to establish partnership arrangements with the municipal authority so that something concrete would always be going on, not just from time to time” (J - Teacher).*

## V) Surprises along the way

In harmony with the tenets of qualitative methodology, Bracagioli (2007) states that some of the issues can be left unsolved, thereby enabling the group to propose actions according to its own development and involvement and making the meetings a more motivational and more participatory experience. In that context, during the second meeting with the Community 1 group, the sons and daughters of the adult participants also took part. Albeit unforeseen, it was a moment that contributed positively, generating reflections, encouraging the adults and making the meeting altogether more dynamic:

*“A task you are carrying out for yourself, and one that we have left off doing, but that does not mean it is not helpful for us; it is a mistake on our part not to bring the children together and talk to them about the litter... and look at them here, answering and passing it on to other people” (N - Community 1).*

Indeed some members of the groups expressed their concern in regard to working with environmental education for adults, alleging that in them habits were ingrained and so change would be more difficult to achieve. That preoccupation however, was only felt at the beginning of the meetings and it could be seen that the adults did engage in the proposed work and they did perceive the need for immediate, concrete actions in

regard to marine debris. Another aspect observed was that the adults saw themselves as responsible for the actions that could be carried out but they also supported the idea that the children should be integrated to them as well.

In regard to the teachers group, the surprise was an invitation to give a lecture and the inclusion of the Day of the Oceans in the program of activities for Environment Week. Furthermore, the teachers carried out various activities addressing the theme of marine pollution with the students in their classes and all the activities were registered in forms as suggested by the teachers themselves.

The final meeting was attended by at least one representative of each group in addition to the administrator of the protected area in which traditional regional coastal communities 1 and 2 are located and the administrator of a marine protected area in the region. That moment made it possible for the participants to gain an understanding of the work as a whole and to see how the other groups perceived the question of marine debris. It also gave them an opportunity to get to know one another better because, even though it is a small city and the group members did know one another, moments of integration for this purpose are uncommon and it was possible to discern the potential beginning of joint articulations.

## Reflections on the process

Loureiro (2005) considers that the success of a critical environmental education activity does not consist in fully achieving the formally stated objectives but, instead, in unfolding a participatory process along the way in which learning has taken place in an emancipatory and transformative manner. In regard to the process unfolded in this study, it was possible to see that the theme had aroused the participants' interest particularly because all of them were connected in one way or another to the marine environment. Difficulties and fragilities were also part of the process such as: a) difficulty in scheduling the meetings which often required various attempts and accordingly the data collecting period had to be extended; b) the numbers of persons participating, which were notably different among the groups albeit even the groups with only two representatives addressed the theme with the same dedication as the groups with more members; c) the number of meetings varied from group to group and it was notable how when a group had more than one meeting the members were able to contribute additional reflections and experiences that occurred in the interval between meetings, enriching the conversations and showing that the theme was beginning to be viewed in a different light. It was found that the intervals between meetings help towards the evolution of the theme under discussion showing that ongoing processes are more significant than sporadic meetings.

It was very clear that each group viewed the complex problems of marine debris in a different way. While some participants only focused on the visual impact of the debris on the beach, other groups had knowledge about the magnitude of marine pollution and expressed critical positions in regard to decision making by their own sector and by other sectors involved. The groups' approach in regard to distribution of responsibilities and co-responsibility was a critical one insofar none of the groups attributed responsibility for

the marine pollution situation to any single social sector. In the discussion of what actions would be necessary to mitigate the marine debris problem, the groups identified various actions in the sphere 'individual-I' such as participating in selective waste collection and refraining from the use of disposable items, and other actions in the sphere of 'collective-I' that ought to be undertaken in the sphere of their group and even among the groups. Thus everyone was disposed to carry out mitigation measures internally and in interlocution with other social actors, irrespective of whether they were research participants or not.

It is evident that this research helped in providing the initial motivation designed to broaden the participants' vision in their endeavor to 'discern' the complex problems associated to marine debris, insofar as the reflections and discussions that ensued were extremely rich and constructive. There were moments of visible unease in the participants' affirmations and, as the research progressed, actions associated to the theme were undertaken. The data indicate that, in consonance with concepts of the (single, double or triple) loops involved in social learning (DYBALL et al., 2007), this research achieved single loop learning because some individual and some group actions were carried out during the course of the study. It was not possible to identify any double or triple loop learning within the sphere of the research activities due to the limitations of the data gathering techniques and the time limit established for the research. However such identification could be pursued outside the context of this study. The analysis of the process shows that the participants perceived themselves first of all as individuals recognizing those actions they could undertake as citizens, and then, at a second moment, as a group, to boost those actions already carried out and plan new activities; and also as members of a group that ought to act in partnership with others to achieve more ambitious objectives associated to a theme of common interest..

In that context, in addition to actions that were already being carried out by the groups (cleaning rivers and beaches, selective waste collection, encouraging visitors to traditional communities to be more careful with their litter) group members made new suggestions such as installing containers for the debris the fishermen bring in from the sea, a more in-depth approach to the theme in schools and other social environments, and greater publicity and support from the municipal authority for separating waste in three fractions (organic, recyclables and rejects). Generally speaking the participants perceived how complex it is to face up to this issue and how it requires the implementation of public policies specifically directed at environmental education in addition to agreements and documents concerning marine pollution in the local, regional and global spheres.

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# RELATIONS OF VARIOUS SOCIAL ACTORS WITH MARINE DEBRIS IN THE MUNICIPALITY OF CANANEIA, SP

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DAIANA PROENÇA BEZERRA  
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## RELATIONS OF VARIOUS SOCIAL ACTORS WITH MARINE DEBRIS IN THE MUNICIPALITY OF CANANEIA, SP

**Abstract:** This research set out to conduct a participatory diagnosis in the municipality of Cananeia, south coast of Sao Paulo - Brazil, of how different groups of adults with direct links to the marine environment (recyclable waste pickers, fishermen, teachers, municipal administrators, traditional regional coastal) view marine debris. Data gathering took place from April 2015 to March 2016 employing techniques appropriate to each group's specificities such as questionnaires and interviews. Data analysis revealed five emergent topics: retrieval of previous activities involving marine debris; resignification of concepts; identification with the marine environment; perception of and responsibility for impacts; and surprises along the way. The conclusions indicate that the development of this research propitiated moments of social learning and deepened understanding of the theme and its complexity, enabling participants to identify themselves as decision makers and active protagonists.

**Key words:** environmental perception, participatory socioenvironmental diagnosis, participatory action research.

## DIFERENTES ATORES SOCIAIS E A RELAÇÃO COM O LIXO MARINHO NO MUNICÍPIO DE CANANEIA, SP

**Resumo:** Essa investigação teve como objetivo realizar um diagnóstico participativo sobre como o lixo marinho é visto por grupos de adultos com ligações diretas ao ambiente costeiro (catadoras/es de material reciclável, pescadoras/es, professoras/es, gestoras/es municipais, moradores de comunidades tradicionais costeiras), no município de Cananeia, litoral Sul de São Paulo - Brasil, entre abril de 2015 e março de 2016. Para tanto, várias técnicas de coletas de dados, como questionários e entrevistas, foram aplicadas respeitando as particularidades dos grupos. A análise dos dados indicou cinco tópicos emergentes: resgate das atividades realizadas em relação ao lixo marinho, ressignificação de conceitos,

identidade com o ambiente marinho, percepção e responsabilidade pelo impacto, novidades ao longo da mesma estrada. As conclusões indicam que o desenvolvimento da pesquisa proporcionou momentos de aprendizagem social e ampliou a compreensão sobre o tema e sua complexidade, possibilitando aos participantes se identificarem como tomadores de decisão e atuantes sobre essa realidade.

**Palavras-chave:** percepção ambiental, diagnóstico socioambiental participativo, pesquisa-ação-participante.

## DIFERENTES ACTORES SOCIALES Y LA RELACIÓN CON LOS RESIDUOS MARINOS EN LA CIUDAD DE CANANEIA, SP

**Resumen:** Esta investigación tuvo como objetivo realizar un diagnóstico participativo sobre cómo la basura marina es visto por grupos de adultos con conexiones directas al ambiente costero (recicladoras, pescadoras, profesoras y gestoras, residentes de comunidades tradicionales) en el municipio de Cananea, sur de São Paulo, entre abril de 2015 y marzo de 2016. Dado lo anterior, se realizaron recolecciones de datos tales como cuestionarios y entrevistas que fueron aplicadas respetando las particularidades de los grupos. El análisis de los datos indicó cinco tópicos emergentes: rescate de las actividades realizadas en relación a la basura marina, resignificación de conceptos, identidad con el ambiente marino, percepción y responsabilidad por el impacto, novedades a lo largo de la misma carretera. Las conclusiones indican que el desarrollo de la investigación proporcionó momentos de aprendizaje social y amplió la comprensión sobre el tema, posibilitándoles a los participantes que se identificaran como tomadores de decisiones y actores.

**Palabras-clave:** la percepción del ambiente, el diagnóstico socioambiental participativa, la investigación-acción participante.

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