The Centrality of the "Mediation" Concept in the Participatory Management of Water

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Abstract

This work presents questions related to the viability and the requirements for the implementation of a National Policy of Water Resources in Brazil, and identifies the means to bring about active participation by the population in the management of water resources. While social inequalities may be an impediment to the implementation of full participation, it is argued that facing the problems related to participatory management of water resources is to be dealt with in the field of rationality, and mediation has been chosen as the central theoretical construct to guide the process of environmental education and empowerment through action research. Examples of formal and non-formal environmental education activities are brought from actions developed closely with the Commission for Water Basin Committee of High Maranhão River, Central Brazil.

Résumé

Ce travail présente une série d'interrogations concernant la viabilité et les exigences de la mise en place d'une Politique Nationale de Ressources de l'eau au Brésil et il identifie les moyens pour susciter la participation de la population dans la gestion des ressources hydriques. Bien que les inégalités sociales ont pu être un obstacle à l'implantation d'une participation complète de la population, il est suggéré que les problèmes reliés à la gestion participative des ressources hydriques doivent être abordés de façon rationnelle. La médiation a été choisie comme concept théorique central pour guider le processus de l'éducation relative à l'environnement lequel sera appuyé par des recherches-action. Des exemples d'activités formelles et non formelles d'éducation relative à l'environnement ont été puisés parmi des actions développées par la Commission pour le Comité du Bassin Hydrographique du haut fleuve Maranhão, Brésil Central.

The report of the World Commission on the Environment and Development, presented in 1987 under the title *Our Common Future*, defended the adoption of a kind of development geared to the long-term maintenance of natural resources under the aegis of sustainability, with special attention given to renewable natural resources (Mebratu, 1998). Several areas of the expansion

of civilization have drawn world attention, and the question of water resources has stood as one of the worldwide environmental concerns, including in our country (Freitas, 1999).

In Brazil, the promulgation of Law 9.433, on January 8, 1997, which established the National Policy of Water Resources, increases the value of this theme in the national environmental scenery, giving central priority to the democratization of the management of river basins and the participation of society in the identification of problems and formulation of solutions. The management of water resources becomes anchored in a model of participatory management and grounded on a diagnosis and a project concerning the availability and the demands of water resources. In theory, this fosters greater participation of society in the management of water resources.

However, in most cases there is an asymmetry in this form of participation, which demands encouragement and the preparation of society for this engagement. This can happen because, although the participation of new social groups in the decision-making process has been established among the basic principles of integrated management of water resources, experience demonstrates that the failure in acquiring information by the groups involved (stakeholders) compromises their overall participation (Salles, 2001).

Participation requires the introduction of new paradigms in knowledge, the search for new political spaces, and the production of new social practices. Individual participation in the management of water resources is the initial stage for society to integrate the decision-making process around the adequate use of these resources nowadays, and with concern for the availability of good quality water resources for future generations: The sustainable use of water resources. Collective participation is the next, and central, stage as a consequence of an effective environmental education process.

The objective of this work is to present a series of questions about the viability and the demands for the implementation of this policy in Brazil, and to identify the means that make it possible to allow popular participation in the management of water resources. In this process of reflection, we will introduce mediation as the central theoretical construct which should lead the actions in the perspective of participatory management of water resources and present the contributions that environmental education can give.

Management of Water Resources and Technical Rationality

The Brazilian National Policy of Water Resources attributes privileged status to the River Basin Committee in establishing the negotiations related to the multiple demands for water resources and in resolving conflicts related to these demands. According to Law 9.433/97, the public domain, economic sectors with private interests, and organizations of civil society are represented in the River Basin Committees.

However, the issue is complex. Under what criteria and what bases have the dispute and the resolution of conflicts related to the management of water resources arisen? What forms of agreement can be formed that are related to the specific interests of the Indian ethnic groups and the monocultural farmers of the same region? How can we conciliate the interests of the electrical sector and those of the environmental sector when the construction of a hydroelectric power station leads to the permanent loss of ecological sanctuaries, including endemic species? Or how can we harmonize the interests related to the use of water resources in the agricultural sector and urban supply, or the agricultural sector and the growing importance of industrial use, with possible impact on the nutritional safety of the population, as alerted by Rosegrant and Ringler (1998)? In this context, for this negotiation within the River Basin Committees to be effective, all interest groups involved in river basin resources must be represented and have their interests addressed on equal terms.

This equality seems hard in times of economic globalization, when social exclusion becomes even more pronounced and conflicts tend to be based on new logistics founded on the strategic control of time associated with placing maximum value on the selective use of space (Becker, 1991; Benko, 1994), which constitutes a new demand for nature and technology. The demand for nature is intrinsic to the capital which uses it as raw material and energy for its accumulation (Levins & Lewontin, 1985).

The end of the 20th century witnessed a reordering of the power structures and the consolidation of a new hegemonic viewpoint on the management of these conflicts: the search for social justification of the solutions sought by the dominant sectors of society. The new political culture, based on decentralization, demands greater participation from society, even if this participation does not truly represent a process of inclusiveness and social justice. But the defense of the decentralization in the management of water resources must not be based on the neoliberal concept of minimization of the state.

The national state still occupies a fundamental role in the public arena, particularly in the viability of social participation. This is demonstrated in the report of Kiara, Munyikombo, Mwarasomba, Pretty, and Thompson (1999) regarding the role of the Ministry of Agriculture of Kenya to mobilize people to embrace soil and water conserving practices on their own teams. Swallow, Garrity, and van Noordwijk (2001), based on the analysis of Kenya and the Philippines experiences, defend the notion that the state can play an important part in the solution of problems, because it can exercise various roles on different scales: at the local level, the state can help to facilitate the development and effectiveness of local organizations; at the regional level, the state can provide significant assistance through policy and financial support to group activities and strengthening; at the national level, a favourable environment may be a crucial element for local organizations to be effective.

Under these terms, the social negotiation outlined by the River Basin Committee in Law 9.433/97 raises still another question: "What is needed for a free dialogue to take place among the diverse interests of users of water resources, without coercion from political forces and with equal access to the information which is essential for making rational decisions?" (Saito, 2001a, p. 37).

We claim it is necessary to define the problem within the context of rationality and of communicative action, praised by Habermas (1994). According to him:

> the progressive 'rationalization' of society depends on the institutionalization of scientific and technical progress. As technical methods and science increasingly spread into institutional realms of society, thus transforming these institutions, the former legitimizations are eroded. (p. 45)

Marcuse (1964), in his essay "One Dimensional Man," proposed that this new rationality is actually intended to implant, in the name of this very rationality, a type of hidden political dominance. This domination, which was formerly imposed by force, is now imposed in an invisible way, by science and technical methods, whose development occurs principally to attend the need for greater control and domination of nature and human beings by the dominant class. But, they are presented as carriers of a neutral essence. The legitimization granted by rationalization is based on this image of neutrality and on the lack of familiarity and technical dominion by the popular sectors, which, being incapable of establishing a dialogue in this field, end up accepting any decision under the banner of science and technical methods, which have been mythicized. In his own words, "Technological rationality thus protects rather than cancels the legitimacy of domination, and the instrumentalist horizon of reason opens on a rationally totalitarian society" (p. 158).

Thus, if the negotiation within the River Basin Committees is based on technical argumentation, that is, in the realm of rationality, this negotiation can only be fully satisfactory if all parties involved are willing to work their way through the constraints, with sufficient security and agility. People should be able to participate in order to evaluate the demands of all users according to the demands of each of them, and to make decisions within the committees with awareness and understanding regarding the arguments and technical evaluations presented by the Water Agencies. In other words, it is essential that all those involved have understanding of science and technical knowledge, so that each is able to present counter-arguments in this very realm of rationality, without being obliged to be silently subdued, due to lack of knowledge, following the simple myth that a rational argument is always legitimate and correct. This is the great challenge for a critical environmental education.

Figure 1 illustrates this context and the necessity of establishing a regular flow, conscious and independent, from the River Basin Committee to the Water Resources Plans so that the diverse segments of society may intervene in the realm of technical evaluation.

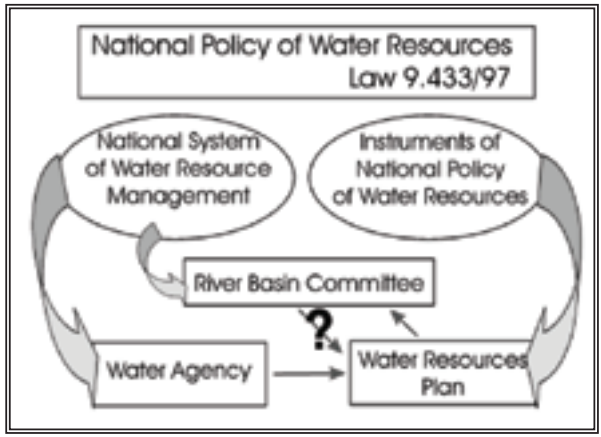

Figure 1. Flows of Social Actions that Integrate the River Basin Committee, the Water Agency, and the Water Resources Plan.

Since the field of rational debate is also a field of coercion and exclusion, which seeks to legitimize the dominant discourse, first of all through its social origin (thus defining the speakers and eliminating the unfit), and subsequently by the debate over content (now among the legitimized members), it is necessary that we seek to empower the organizations in these community representations, according to Friedman (1992).

Nevertheless, empowerment requires a process of basic level technical and scientific education for the popular sector members as part of a critical environmental education, which in turn leads to new requirements, and so on, in a growing synergistic spiral.

According to Bazin (1977), who was inspired by Paulo Freire (1982, 1983), basic education does not mean merely transmitting the technical skills of reading and writing, like basic literacy, since education can only make sense if it leads a person to master and change the world, understanding it and expressing it. As a result, technical and scientific education is considered with the same ideological objectives, substituting reading and writing with technical skills and scientific attitudes. In his words, "these observations regarding the necessity of technical education aim, in the same way as habitual basic literacy, not only to free the masses from a state of subjection, be it economic or intellectual, but above all to provide the possibility of initiative and self-control" (Bazin, p. 97). This writer also believes that the process of basic technical and scientific education must be put into practice, by searching for solutions to specific problems. This way, one can dominate the technical aspects consciously, and not only revere them, which would also constitute a form of alienation. This conception is necessary to be transposed to environmental education. Canadian experience shows that by determining the scientific credibility of community and volunteer monitoring using accessible methods, we can

assess their value as a tool for communities to manage their environments, when there is increasing public mistrust of government's care of the environment (Bagchi, Chen, Martinez, Dudley, & Sorger, 2000).

Mediation and Empowerment

The term mediation started to be used in the 1980s, and became more customary in the 1990s. It usually designates the way some professionals (mediators) work with the aim of settling conflicts by searching for a consensus between two poles that cannot reach a solution for a specific situation or problem. Therefore, mediation is traditionally regarded as the action of elements external to a context. In this case, mediation expresses a vacuum, a distancing between two segments that require external intervention.

From the structural point of view, there are two poles and a distancing, which is not extinguished or decreased, just legitimized, and the conflict is mitigated. The expert does not transfer his knowledge, the difference of power. Knowledge and interests are not altered, and the contending parties may again need expert mediation in the future, in a similar context.

The concept of mediation must be discussed under another focus: We take the existence of the distancing as our starting point, not to maintain the distancing, but to eliminate it, or, at least, to diminish it. Thus, mediation consists of building an emancipative process in which the members of the community involved are not "emancipated" or "made aware" by external agents who bring knowledge to them. Instead, they are strengthened and they experience the existential process of emancipation through socio-community empowerment. Many are even unaware of their right to participate and confront their legitimate demands for water resources against the demands of others. We need to start from the premise that society is unequal and that marginal segments of the population must be identified and strengthened, as is defended by Fernandez (1999), through the evaluation of the results of *Myranda's* watershed projects in South India.

Here we talk about *mediation* as a process of *mediated action* in which the technician shall try to question official and technical information not easily accessed by the ordinary citizen, based on situations ("limit-situations" in Freire, 1983) that can be decoded, without creating a process of dependence between the party that knows and the other that is still lay. Therefore, mediation consists of a process of building full citizenship through dialogical moments, involving technicians, especially university researchers, and community, mediated by the search for understanding reality from "limit-situations." This process makes it possible to bring the two segments close together, thus allowing technicians to give their contributions so that members of the popular sectors can gather enough knowledge to engage themselves critically in the field of rationality and participate effectively in making decisions within the ambit of the River Basin Committee. Then, between the technician

and the community an effective, fertile, and proactive dialogue is established (communication), which mobilizes them, so that together they can understand and transform reality. "Liberating education consists in acts of cognition, not transferrals of information" (Freire, 1983, p. 67).

We have adopted the term "basic technical and scientific education" to equip the process of *mediation* (*mediated action*) between technicians and community in the search for understanding reality. This conceptual frame is considered to be in accordance with what was introduced by Bazin (1977). According to it, to educate technically does not mean transmitting a purely technical ability. It just makes sense if the use of words can cause people to own and alter the world, understanding it and expressing themselves. This mediation process is the critical environmental education that is necessary to a participatory managemnt of water resources.

Thus, basic technical and scientific education must be experienced as action research, in the way it was introduced by Carr and Kemmis (1986) and Grabauska and De Bastos (1998), so that people involved become subjects of the process of building knowledge (research), which in turn informs the planning and decision making and reality transformation (action), reinforcing the process of empowerment (Saito, 2001b). During the action research process, the community, or the social group itself, is encouraged to study, research (investigate) its reality, and act on it instead of having an external researcher study and advise this same community or social group. In this way, the elimination of the subject-object dichotomy is pursued, promoting the empowerment of the community as a whole and of its members individually. Technical education is not imposed or donated. It is experienced by the interested people themselves.

Paul Polak, from International Development Enterprises, has apparently been treading this very path by disseminating water pumps, moved by pedals, in Bangladesh to reduce the impact of droughts on farmers' economic and social life. According to him, the choice of alternative technologies is justified by the belief that farmers themselves need to engage in technology that brings them water. Another one who seems to share this same concept of social action is Rajendra Singh. He has been dedicated to the building of *johads* in India: Dikes with a 5,000-year-plus tradition, which use the natural declivity of the land to channel and stock brief and intense precipitations caused by summer monsoons (Montaigne, 2002). One significant similar experience, and more directly related to environmental education, is the Canadian experience to develop methodology for public monitoring of total coliforms and toxicity in waterways by high school students. Watershed Action Towards Environmental Responsibility (WATER) is a project that is a part of the Hamilton Harbour Remedial Action Programme. Bagchi et al. (2000) concluded that these high school students were able to produce values for total coliforms per 100 ml water sample, percent total coliform that are *Escherichia coli*, and toxicity usind *D. magna* as endpoint,

comparable to those of an expert and to those using more expensive, modern, and officially accepted methods, contributing strongly to the empowerment of public participation in environmental management.

As stated by Freire (1983), it is necessary to begin with existing problems in the community, such as Freire's "generative themes," with the aim of building knowledge through action research. In the search for the emancipative character, both information and scientific concepts built with the community aim to promote rationality and justice in social practices along with the understanding of these practices and their situations, and then, to transform reality (Carr & Kemmis, 1986).

Therefore, mediation or mediative action seeks to provide technical-scientific instruments to the population involved. Thus, this process can equip them with necessary knowledge, initiative, and control over the decisions that each representative segment in the committee must make. Friedman's *Empowerment* (1992) is sought where improving socio-community knowledge, based on common interests and participatory actions are necessary to settle local problems. Through mediation, we seek the complete autonomy of those social segments which represent the classes less integrated into information systems in the River Basin Committees.

In Figure 2, interdependencies in the process of mediation, as we conceive them in the environmental education for a participatory management of water resources, are shown schematically, making clear their political commitment.

Figure 2. Mediation in the Context of Environmental Education for Water Resources Management, Based on Action Research and Empowerment.

This complex process, that integrates action research and empowerment in creating the conditions to allow for the actual existence of participative practice in the management of water resources, is the way to implement, in fact, the principles of the National Policy of Water Resources. It is important to remember that this proposition is backed by the foundations and principles of the National Policy of Environmental Education—Law 9.795, of April 27, 1999. From this law, four great challenges for environmental education, heading towards sustainability, have been extracted by Saito (2002):

- To look for a democratic and socially fair society;
- To lead in the disclosure about the dominance relationships in our society;
- To live effectively and concretely transform actions; and
- To search for knowledge constantly (permanent education).

The mediation concept comes around to complete this picture, just to reinforce the idea that there is a historical social debt that has to be redeemed not with donations or impositions which would only widen that abyss and yield a greater dependence in relationship. The process of paying off that debt is slow, having to do specifically with the empowerment of the popular sectors, so as to secure their greater autonomy and independence, and allow them to exercise, in full, their citizenship, with an equal power for intervening in the realm of rationality.

The efforts geared to the perfecting of the processes of management of water resources in the literature have emphasized, in general, the need for valuing the participatory component and the search for greater social equity, and for permanent education and community organization. Swallow et al. (2001) link the need to legalize the right to land ownership to the strengthening of the process of participatory water resources management because farmers in upland areas will not invest in soil conservation measures when they have insecure property rights. Hofmann and Mitchell (1998) add equity to the principles that support their *respect* model for developing or improving the water management decision-making process. Fernandez (1999) gets to the point of affirming that "if equity is not sustained, the pressures on the watershed's resources—and therefore on sustained productivity—tend to increase" (p. 295). Johnson, Ravnborg, Westermann, and Probst (2001) also include the need to incorporate traditional knowledge and practices in participatory management because it is not enough to call countersigning agreements participation. It is necessary that participation represent proposals and co-responsibility, so users should help to define problems, set priorities, select technologies and policies, and monitor and evaluate impacts. To these authors, user participation in water resources management raises new questions about how to design appropriate mechanisms for organizing stakeholders and facilitating collective action.

In this sense, we aim to integrate and to deepen, from the theoretical-methodological standpoint, the current reflections on the theme "environmental education for participatory management of water resources." We aim to clarify the emancipative commitment and highlight the mediation concept articulated to empowerment and action research concepts, and to simultaneously promote research processes, transforming action, and community organization, meaning greater social justice. Environmental education activities are commented, integrating formal and non-formal education for water resources conservation and management, developed in the research projects "Environmental Education and Partipatory Research," supported by National Fund for Environment (1999-2001) and "Technological and Methodological Development for mediation between users and Water Basin Committee," supported by Brazilian National Science Development Council—CNPq (2002-2004). Both of these projects were developed in Central Brazil, near the protected area named Estação Ecológica de Águas Emendadas ("joined waters").

In the beginning, environmental education was conceived to help the community of Jardins do Morumbi, an agricultural area in Planaltina-DF, to protect a small waterfall in their neighbourhood, where children usually go to swim. Local public school was involved and teachers of elementary school were asked to develop an integrated curricular planning process, aiming to strengthen the community organization and the collective knowledge about water resources conservation. Interdisciplinary activities were developed linking the protection of water with other school curriculum contents like, for example, education for urban traffic, where the red, yellow, and green colours of the traffic signal were associated to messages of stop polluting the river (red light), attention because the water level in the river can become lower (yellow light), go on preserving the waterfall (green light). Thus, they tried to develop all the activities in classes related to the theme water resources. The Public Prosecutor's Office for the Environment Protection was asked to analyze local land owning conflicts. Community members finally understood that the waterfall was just a point in the river course and that its protection was demanding a stronger and regional organization. This conclusion was followed by the decision to look for other communities alongside Maranhão river course. So, the Commission for Water Basin Committee was born in 2002, an indicator of the increasing local and regional empowerment.

Later, working closely with the Commission for Water Basin Committee, the local school was again involved because school and community should work together, and formal and non-formal environmental education must be articulated.

During several regular meetings of the Commission for Water Basin Committee, we could help their members define the limits of the desired water

basin area and the role of the water basin or a specific portion of it. Remote Sensing and Geographical Information System (GIS) techniques were used to compare the limits based on several criteria proposed by themselves, which were projected on the wall, by a datashow equipment, so that they could see and discuss them. At the end of the process, the members were conscious of the scientific concept of water basin, watershed, scales, boundaries, thematic maps and geographic coordinates, and the Commission has decided for a restricted area corresponding to the high portion of the Maranhão River, around the third part of the linear extension of the mainstream. At this point, the Commission for Water Basin Committee could designate itself as the Commission for Water Basin Committee of High Maranhão River. After solving this problem, we made a maquette of the High Maranhão River water basin together, using topographic maps scaled in 1:100.000, and the participants could incorporate new concepts such as contour lines, elevation models, and land use types. These activities aimed to promote a basic level of technical and scientific education, as part of a critical environmental education of the popular sector members of the Commission for Water Basin Committee.

These described non-formal education activities were closely integrated to those formal education activities at the local school, where teachers have also made a collective maquette of a small area of the same water basin in a different scale (1:10.000). This scale was chosen because it was able to represent more clearly the localization of the small waterfall. In March 2004, because of World Water Day, teachers and students paid special attention to this theme and, taking water as a "generative theme" (Freire, 1983), to study Portuguese grammar, foreign language, mathmatics, geography, history, sciences, and arts. The students showed their learning products in a commemorative event at school, to their parents and other community members. The Commission for Water Basin Committee also distributed their booklet about the participatory management of water resources and invited teachers and students to be present at the hearing called by the Public Prosecutor's Office for the Environment Protection to debate the environmental impacts produced by a clay minning enterprise near the river and its licensing. Later, the Commission for Water Basin Committee has hardly criticized the process of "social mobilization" and the technical assessment developed during the production of the Regional Water Resources Management Plan by the local government. These events were clear signs of the increasing empowerment of the community and their awareness of environment conservation, and they have also showed that a critical environmental education was being developed, because their environmental actions have a popular mobilization and emancipative component. The school was put side by side with community struggles, and the decision about what to teach—their curriculum planning process—was supported by action research concepts, to simultaneously promote collective planning, research processes, reality transforming action, and local empowerment.

Conclusion

The mere promulgation of the Brazilian National Policy of Water Resources, and the incorporation in the legal text of the concept of participatory management, does not in itself guarantee the materialization of principles that the government claims to represent as a new institutional benchmark in the country. In a society beset by deep social inequalities and without a strong tradition in participative processes such as in Brazil, the proposal for the management of river basins with the participation of society in the identification of problems and formulation of solutions is still far from setting itself up as participatory management. More than just that, we run the risk of *confusing* ***participatory management*** with ***forged legitimization***.

This is because only information, together with subsequent reflection about it, can offer conditions for informed opinions. And people can develop awareness regarding the water resources issue if they can inquire about the true dimension of its influence on their lives and on the community in which they live. When communities involved attain an increase in their levels of information and in their capacities for interpretation and counterproposition of technical argumentation in the field of rationality (basic level technical and scientific education), allied to an increase in the capacity of intervention in the course of reality through the organizational strengthening of the communities (empowerment), we can glimpse the realization of a critical environmental education and consequently a participatory management.

The development of these two components, separately and without a theoretical-practical referential in regard to action research, can lead to a process of greater participation with no argumentative basis, resulting in frustration, or in a process of unidirectional transmission of information, which only deepens the scientific and cultural dependence of ordinary people on technicians.

The mediation based on empowerment and action research as a dialogic process of basic level technical and scientific education holds in itself the potentiality of the "Freirean" emancipative pedagogy, the way to the construction of a truly democratic and sustainable society, rooted in social justice. Therefore, we do not regard, as theoretically valid, to speak of an environmental sustainability dissociated from social sustainability; nor can we overemphasize the intergenerational equity present in the concept of sustainability of the report *Our Common Future* (World Commission on Environment and Development, 1987) to the detriment of the struggle for the establishment of intragenerational equity. One cannot come without the other.

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