



# PARTICIPATORY ACTION RESEARCH IN NATURAL RESOURCE MANAGEMENT

A Critique of the Method Based  
on Five Years' Experience in the  
Transamazônica Region of Brazil

Christian Castellanet  
Carl F. Jordan



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# PREFACE

In the 1980s and early 1990s, I had the opportunity to observe a number of development projects in the Amazon region of Brazil. Some of the projects were designed to improve the life of colonists in the region, while others were focused on management of natural resources. All the projects were “top down” in the sense that project design and direction were carried out by high-level corporate or government sponsors at headquarters far removed from the affected areas. There was little or no input from people who actually lived in the area, people who had first-hand knowledge of the social and environmental problems in the areas to be developed. As a result, most of the projects were not as successful as they might have been.

During the course of my visits, I became aware of the Programa Agro-Ecológico da Transamazônica (PAET). This effort was sponsored by the European Community and Groupe de Recherches et d’Echanges Technologiques (GRET), a French nongovernment organization. The objective of PAET was to improve farming practices and management of natural resources along the Transamazonian Highway (really just a dirt road) near Altamira, Brazil. The focus was on the community-based participatory action research (PAR) approach to development.

I was interested in whether PAR might be a better method than the approach used by other projects that I had studied. I met the GRET project leader, Christian Castellanet, and persuaded him to take a PhD with me at the University of Georgia with the condition that, for his dissertation, he would analyze and report on the strengths and weaknesses of the PAR approach to development based on the Altamira project. He agreed. This book is based on project documents, transcripts of meetings, interviews, and personal notes that Christian took during his five years in Altamira.

The project had some successes and some failures and, as is true for all projects, many aspects were unique to the place and time. However, insights regarding strengths and weaknesses of PAR may have a more universal applicability. The interactions that developed and the problems that arose

between the research team, the local community, and the focus group (in this case, the farmers' organization) may be similar for any PAR concerned with resource management. So that future projects using PAR might derive the most benefit from the Altamira experience, we focus on analysis and discussion of the method, with the project itself as a backdrop against which PAR is used and evaluated.

*Carl F. Jordan*



# INTRODUCTION

The involvement of scientists in public affairs has grown since the end of World War II. Initially, it was restricted to questions pertaining to military capabilities (Rotblat 1982), but this involvement later included other areas such as development, human rights, demography, and environment. Concern about the latter increased sharply after the Club of Rome report, in which stark consequences were predicted if the world's population exceeded the environmental limits of growth (Meadows et al. 1972).

As technology has continued to progress and apparently insoluble social problems have continued to develop, educated citizens have begun to realize that science has given us a formidable capacity to manipulate the physical world, but a very low capacity to intervene in social problems such as the growing gap between the rich and poor, unemployment, population control, growing violence, and social instability (Lakoff 1980). The development of human wisdom and the capacity to better organize and cooperate has not paralleled the development of science. Science has shown us that the more we manipulate things, the more we run the risk of destroying our own habitat, or at least damaging it so much as to make our existence miserable. As Rabelais put it 400 years ago, "Science without Conscience is but the Ruin of the Soul."

Both the perception of science by the public and the perception that scientists have of their role in society are changing. Although we still depend on science and technology for the operation and improvement of our material culture, few still believe that science has the answer to all human problems. Indeed, we are now confronted with a set of problems that are increasing in number and intensity. Many are the result of technological and industrial developments. Science, although a necessary element of their solution, will not be sufficient for *their* solution. After World War II, one could imagine science advancing boldly, steadily rolling back the frontier between knowledge and ignorance. Now we must cope with our ignorance of the ramified effects of science (Ravetz 1989).

Complex social and environmental problems are not amenable to the usual reductionist/disciplinary methods of science. Scientists trying to

solve such problems have to integrate uncertainty into their conclusions (Jordan and Miller 1996). Ravetz (1989) and Roqueplo (1996) showed how the uncertainty associated with most complex environmental problems affects scientists' behavior and places them in an uncomfortable position as "experts." Scientists engaged in environmental issues also try (although they are not always conscious of it) to intervene in order to change some or all of society. More precisely, if one adheres to an individualist perspective, he or she tries to change other people's behavior. Many scientists do not have sufficient training and background in social science to coldly and objectively analyze their own position and concepts in this context (Bailey 1996).

Participatory action research (PAR) is a method that has been proposed to overcome the problems inherent in traditional scientific approaches to problems of development and resource conservation. However, PAR has not been tested adequately in the context of natural resource management; it is not yet clear if it presents a viable alternative to the traditional approaches. The work on which this book is based has presented an opportunity for an in-depth examination of the method. The results will be of interest to scientists and policymakers who are trying to increase the efficacy of programs intended to solve environmental problems. The lessons learned may help them achieve their goals.

PART

# I

# BACKGROUND



# Approaches to Resource Conservation

## □ Traditional Scientific Approaches

Natural scientists who participate in practical measures to solve environmental problems generally take one of two contrasting approaches: the moralist/educational view or the authoritarian view. The moralist/educational view assumes that human beings are willing and able to change their values and subsequent behavior once they understand the long-term consequences of their actions on themselves and others (Leopold 1949, Orr 1992). The authoritarian view holds that politicians, who are supposed to be able to guide the rest of society, should listen to enlightened scientists who can tell them of the best policies (e.g., Myers 1979, Wilson 1992). This view is in the tradition of Auguste Comte (1854), who suggested that scientists should be in charge of government. Both approaches can be considered “top down,” that is, a blueprint for local situations.

### The Moralist/Educational Approach

Those who take the moralist/educational philosophical line usually choose to work in education, mass communication, or public relations. The long-term impact and efficiency of this type of effort is difficult to evaluate. On



the one hand, it is naïve to believe that the basic values and attitudes of a culture change drastically in one or two generations. Historians of culture note that cultural traits generally change slowly, more slowly than technology and the environment in which the technology emerges. On the other hand, new religions and political revolutions have resulted in drastic changes in ethics. Public campaigns can also result in a change of values. The growing consumer interest in “green” products demonstrates the latter point. However, the recent debate about US oil consumption and the rejection of any oil taxation show that the common good remains marginal compared with individuals’ values. It seems unlikely that the “greening” of citizens’ opinions is sufficient to profoundly change the type of development that has prevailed over the last centuries.

Another limitation of the moralist position arises from cross-cultural dialogue, that is, intervention in foreign countries with different cultures. Often, legitimate concern about education in international cooperation programs translates into ill-conceived and inefficient schemes of “environmental education.” These efforts frequently have, as a basic tenet, a naïve view of education. Unwise use of natural resources, it is believed, is the result of people’s ignorance of the functions and values of nature. Those who hold this belief are naïve in various senses: (1) by believing that local people don’t know the value of natural ecosystems and how they can benefit from them; (2) by forgetting that natural ecosystems also pose a threat (poisonous snakes, disease-carrying insects); and (3) by not understanding that immediate survival may depend on exploiting natural resources without regard to sustainability. The small farmer who burns his forest to replace it with pasture is not fundamentally different from the ecologist who uses a big car to go to his or her laboratory. Both know that they are using natural resources in an unsustainable way, but the farmer may have an idea about how he will develop a new agricultural system after the forest is gone. The ecologist should know that there is no known way to reverse the build-up of carbon dioxide.

Informing people about the consequences of their actions is not totally useless. For example, a good information program can promote awareness that certain resources are apparently limited. Thus, people may come to accept and even support new rules or policies that will restrain their use of these resources. However, changing actions as a result of an information program is quite different from changing fundamental behavior as a result of cultural evolution.

## **The Authoritarian Approach**

In the authoritarian approach to development, political, economic, or bureaucratic authorities, based on recommendations by consultants, often

decide on a project. In natural resource management, the consultants are usually scientists. However, scientists are often divided, both on the practical measures that should be taken to solve a particular problem and on the exact nature and gravity of the problem.

To solve scientific uncertainty in natural resource management, a proposal is often made to establish huge interdisciplinary research programs to reach clear conclusions on the nature of the problems, and solutions are recommended. The results have generally been weak from a scientific point of view and even more disappointing when it comes to practical decisions and results. The problem of interdisciplinary research has been discussed by various authors, particularly Pivot and Perocheau (1994), Godard (1992), and Rhoades (1984).

Another problem with authoritarian solutions is that politicians' capacity to influence society may be much less than is commonly believed. It is difficult to enforce a law or rule that is not accepted by the majority of citizens, even in the most dictatorial regimes. In the case of protection for national reserves and parks in developing regions, Sayer (1991) concluded that legal protection is seldom sufficient to permanently guarantee the integrity of protected areas. The local population frequently sees parks as a restriction on its traditional rights being imposed by a distant, central government. When this happens, protected areas lose popular support and their condition quickly deteriorates.

An example of the authoritarian approach is given in McKinnon et al. (1990) in *Management and Guidelines for Tropical Protected Areas*. Most of this manual discusses the planning and establishment of protected areas exclusively on the basis of discussions among scientists, nongovernment organizations (NGOs), and governments. This book notes that park authorities should cooperate with local populations in finding ways to obtain some economic returns from the protected area. However, it doesn't point out that local populations and authorities can negotiate issues such as boundaries of a protected area and rules for management of the reserve. Local people are to be invited only to "cooperate" in project implementation, not to participate in the project design. As a result, conflicts are common and the resource management plan hardly ever survives (Sayer 1991).

Difficulties in the authoritarian approach arise partly because most of the staff of conservation projects and organizations consists of conservation biologists, foresters, and wildlife managers. They tend to separate the human component of conservation projects from the biological component, to which they give more attention and priority. They fail to recognize that, although the ultimate goals of conservation efforts may be driven primarily by biological theory and ecological research, the process by which conservation is achieved is overwhelmingly social and political (Bailey 1996). In our opinion, neither the educational approach nor the authoritarian approach can be effective in solving the world's environmental problems.

Other methods must be used, based on the participation of all stakeholders and on negotiation and compromises among these different actors (participants) and the state.

## ☐ **Conventional Methods of Intervention for Natural Resource Management**

Most environmental problems are the result of inadequate management of natural resources at the local level. Various types of intervention can be proposed to improve local management, with a view toward broader and more long-term interests. The methods of intervention proposed to reach this objective can be diverse, and their respective merits and weaknesses are still in debate. They range from highly publicized demonstration projects, organized at the local level and visited by public officials, to programs linking environmental public agencies with mass environmental education. A particular case is the establishment of “nature reserves” or parks, for which either an authoritarian or a participative approach can be used.

### **Nature Reserves and Buffer Zones**

Despite the growing use of participative rhetoric in the discourse of international conservation organizations such as the International Union for Conservation of Nature and the World Wide Fund for Nature, in practical terms local participation is generally restricted to discussion about the type of compensations the local population might receive from the park or reserve authority in return for their losses, which may include restrictions in access to reserve land and natural resources (see Taylor and Johansson [1997] on the Masai participation in Ngorongoro protected area).

In a study organized by a conservationist organization, Hannah (1992) concluded that most conservationists believe that local populations should participate in management decisions concerning African parks and should share in profits from tourism. This participation and sharing are necessary for the long-term viability of protected areas. However, these are still ideas; few parks in Africa really allow local populations to participate in decision-making.

One of the main difficulties is deciding on the most appropriate political structures to represent the interests of local populations. Support of local organizations sometimes results in conflict with the national “elite,” who derive some of their profits from exploitation of local manpower and natural resources. For example, in the Dzangha Reserve in the Central African

Republic, efforts to transfer some of the tourism income to the local Aka Pygmy's groups met fierce opposition from local political leaders and public servants, who derive various benefits from logging in the reserve and from illegal trade of furs and wild animals (Caroll 1992, Colchester 1995).

There is no simple method of implementing the conflict management strategies that part of the conservationist community now feels to be necessary (Kemf 1993). However, discussion with local communities regarding how they can derive direct benefits from the park (either from tourism or by better exploiting part of its natural resources in a controlled, sustainable way) certainly indicates progress toward acceptance of parks by local people (Ledec and Goodland 1989). Nevertheless, it is not a guarantee of success.

One of the first and oldest efforts to effectively negotiate environmental management with local indigenous populations appears to have been conducted in British Columbia. Conclusions from these efforts focused on the necessity of training local people to do the following: to participate as equal partners in a management team; to make decisions based on consensus and not on a simple majority; to avoid later debates and clashes during local elections; to formalize agreements with unambiguous written contracts; to establish mechanisms that increase community income and participation; and, finally, to establish common research programs (Davey 1993). Another important lesson is that the local population should be associated as early in the process as possible to avoid unnecessary misunderstandings and conflicts. Whenever possible, the local population should be guaranteed its territorial rights. Furthermore, within their territory, they should be authorized to use its natural resources as long as such use does not destroy the resource.

With these conclusions, the conservationists adopted a perspective that reconciled with those who supported indigenous peoples' rights in the management of common goods by local communities (as discussed by Ostrom 1990).

We must avoid, however, idealizing the indigenous culture and its supposed "harmony with nature." Numerous examples show that indigenous peoples are quite able to destroy their natural resources after contact with the market economy and dominating cultures and having access to modern technologies. Anthropologists have not yet found any conclusive link between the indigenous religion and management of natural resources. For example, there is no conscious effort to conserve natural resources in Amazonian Indian societies. As a result of their traditional political and subsistence system, which encouraged permanent mobility of small Indian groups, they maintained a low pressure on natural resources. However, when these Indians become sedentary and gain access to new technologies, they may quickly exploit the local environment (Colchester 1995).

## **Demonstration Projects and Technology Transfers**

Demonstration projects are commonly included in the authoritarian and educational approaches. The basic idea is to encourage local initiatives that lead to a more sustainable use of resources, whether in agriculture, forestry, or fisheries. “Demonstration” is meant to illustrate the superiority of these projects and it is assumed that they will spread by virtue of their example. The projects suffer, however, from the incorrect assumption that just because certain technologies exist, they can be successfully applied in the field. This model has been outdated since the 1960s. Agronomists and anthropologists who have studied diffusion of new agricultural methods have clearly demonstrated that, in most cases, proposed technologies are not adopted because they simply do not meet the needs and requirements of potential users. The problem is not how to get the technology to the small farmers, but how to design or find technologies that are of some use to them (Shaner et al. 1982, Roling 1988).

There is no reason to believe that the diffusion of technologies in the field of forestry, fishing, or extractivism would be much different from the diffusion of agricultural innovations. To be efficient, a project aimed at the diffusion of new technologies should do the following:

- Link research, extension, and social experimentation
- Support social experiments in a progressive and continued fashion (start small, evaluate the results regularly, and grow steadily if the results are encouraging)
- Avoid subsidizing material, equipment, or production itself, since it completely distorts the economic sustainability of the technology that is introduced
- Be flexible in scope and nature, but with regular outside evaluations

This is more or less the opposite of what is done in most demonstration projects, which use the blueprint approach to project planning. This approach usually has limited duration but high external funding and does not leave any opportunity for participatory experimentation and learning.

## **Research on Agricultural and Agroforestry Systems**

By applying known scientific principles, agronomists and ecologists often design agricultural systems that are environmentally superior to systems in use—with regard to nutrient recycling, erosion control, pest reduction, and sustainable production. The approach usually is to design and test the

proposed system in a controlled environment such as a research station. Once its efficiency is proven, the system is transferred to local farmers. However, the farmers for whom they are intended do not usually adopt such systems on any significant scale. A famous case is that of the International Institute for Tropical Agriculture in Nigeria, where various alley cropping systems have been tested for years but local farmers were never convinced to adopt them (Lal 1991). The International Center for Research in Agroforestry has been criticized for its lack of success in getting farmers to adopt new agroforestry systems. However, traditional agronomists have not done any better. For example, the high-input approach of the research station in Yurimaguas, Peru has also been unsuccessful (Sanchez et al. 1987).

It is not through ignorance, tradition, or passivity that farmers do not adopt the proposed systems. These systems might perform nicely from a technical point of view, but they usually do not fit into the farmers' constraints. They are either too labor-intensive or too risky, or they need a long-term investment that the farmers cannot afford (Fujisaka 1991). Floquet and Mongbo (1994) observed in South Benin, in West Africa, that the same farmers who do not adopt the improved technologies proposed by researchers are actively experimenting with their own indigenous innovations in methods of soil tillage. The conclusions are that: (1) researchers should make an effort to identify the existing local innovations and build on them rather than ignore them and (2) improved systems should be designed in an incremental way and in cooperation with the farmers from the start, rather than at the experimental station.

An example of promising alternatives such as agroforestry systems in Amazonia and their analysis and diffusion to other groups of farmers is given by Anderson (1990a). He recognizes that, although the technical and ecological aspects of these improved systems are relatively well known, the economical and social conditions under which they become feasible are understood much less. It is relatively easy, however, to pinpoint the main limitations that restrict the diffusion of the alternative systems described in this book. For example, in the agroforestry system (Anderson 1990b), the critical factor is access to a very specific urban market (in Belém) for fresh açai palm. It would not be possible to implement such an agroforestry system more than 20 miles from Belém. In Japanese agroforestry methods at Tome Açú, described by Subler and Uhl (1990), high capital and technical know-how are needed, but access to Belém markets for poultry, fresh fruits, etc, is also a factor. The Japanese-Brazilian community controls some of these markets, so they would probably not be open to other farmers. The alternative forestry methods proposed by Harsthorn (1990) have not been tested long enough to draw any conclusion about their economic viability.

In summation, the main limitations in the diffusion of improved systems (in terms of ecological sustainability) in Amazonia is not the need for new research into their technical and ecological aspects, but the socioeconomic constraints such as access to market and transportation costs, land market values, capital, training for farmers, and farmers' organizations (Sawyer 1990). This situation does not necessarily imply that the farmers already know the possible alternatives. Exchange visits and training can certainly be beneficial, especially in a large region such as Amazonia with highly dispersed settlements of various origins.

## **The Pilot Program for Amazonia**

In 1991, a pilot program to conserve Brazilian rainforests was approved by representatives of the G7 countries (Batmanian 1994). They agreed that assistance of about \$280 million (US) would be provided in the form of grants, technical cooperation, and loans. After this initial commitment, the executive directors of the World Bank established the Rain Forest Trust Fund and assigned several staff members to coordinate the pilot program and the Rain Forest Trust. The main initiatives of the program were to:

- Establish information systems and training activities to prepare a zoning plan for the Amazon region
- Provide management plans for Conservation Units, such as indigenous reserves and extractive reserves
- Provide support to the Emilio Goeldi Museum and the National Institute of Amazon Studies (INPA) for them to be centers of excellence for scientific research
- Establish monitoring and enforcement of existing environmental laws
- Encourage the rational use of natural resources
- Support environmental education
- Develop demonstration projects

Many of the proposed lines were conceived on a top-down basis and are basically conducted by federal government structures. Therefore, the program is an interesting mixture of locally based demonstration efforts or pilot activities and research, combined with government capacity to monitor and control the processes.

Scientist participation was to be mostly in the form of expertise, in which scientists are consulted regarding which projects are the best to support within each subprogram line. Support for the regional research centers seems to stem from the premise that academic research will help in better understanding what is happening in Amazonia and, therefore, in better directing efforts to save some of its natural richness. However, there is no

provision for linking basic research to project activities or to local demands and proposals.

Demonstration projects in principle encourage the participation of local populations to the elaboration and execution of alternative methods of natural resource management. Most projects are relatively small and are presented by NGOs or local organizations. However, the project selection and funding process do not permit effective participation of the concerned populations. These projects have a rigid framework of three years, the use of the funding has to be rigidly planned in advance, and there is no provision for a preparation or pilot phase. There also is no evaluation of the real participation of the populations in the project planning. The lack of in-depth regular evaluations of the field projects also limits their heuristic value. As a result, many initiatives are likely to remain “small white elephants.”

Unfortunately, the sectorial approach that characterizes the pilot program (with a specific advisory committee for each line, separating research institutions from NGOs and government representatives from project managers) does not favor this exchange of information and debate.

## □ Participatory Approaches

In recent years, new approaches give consideration to the perspective of the local people, sometimes called “bottom up” or “participatory.” In contrast to the authoritarian approach, which is more common among natural scientists, the participatory approach is more common among social scientists. This approach considers that the scientist is also part of the society that he or she hopes to change and that he or she should contribute to the debate on an *equal level* with local populations and other citizens, including professional politicians. The necessity of establishing real communication through a two-way dialogue comes from several premises:

- The complexity of development problems is so great that no single specialist can pretend to know and understand all relevant aspects of the problem.
- It is recognized that popular knowledge and local professional but non-scientific knowledge have value.
- Most environmental problems cannot be resolved solely through either top-down (authoritarian) or bottom-up (participatory) approaches. Top down is the planning process in which technologies, projects, or policy proposals are devised by experts or politicians and then transferred or imposed on local populations. In contrast, bottom up is the process in



which local needs and proposals are the basis on which decisions are taken (Rhoades and Booth 1982, Chambers et al. 1989).

The first two of the latter premises are easily demonstrable and widely recognized among social scientists, but the third premise is more subjective and may be considered a philosophical option rather than a demonstrable rule. However, one can argue that if the first two are true, the third should be true also. In addition, it seems obvious that cooperation of the local population is essential for a good diagnosis of the environmental problem to be treated, but that a higher authority is often needed to give legitimacy to any proposed solution. In addition, solutions have to seem reasonably legitimate to the concerned population to have some chance of success. Therefore, the participation of all concerned groups in the identification and resolution of the environmental problems is essential.

### **Rapid Participatory Environmental Appraisal**

Some international NGOs such as the International Institute for Environment and Development (London) initially specialized in approaches to rural development and developed a method called rapid participatory rural appraisal (often abbreviated simply RRA) which, in principle, guarantees population participation during the initial planning of a given project, spelling out its own priorities and suggestions on "how the project should go." This approach was in fact an adaptation of a method developed earlier by International Agricultural Research Centers called "Sundeo." This method was adapted to natural resources management recently under the name of "participatory environmental appraisal." Such methods bring together, in a relatively short period (15 days), all information and demands expressed by the community. Usually, the work is carried out in groups, sometimes with the separation of special interest groups such as women and young people, and with the participation of local technicians and government agents. The participatory environmental appraisal requires the intervention of a qualified facilitator. Obviously, it represents an advance in relation to the practice of project planning by experts and government officials without any popular participation except to answer questions. However, the participatory resource appraisal has its limitations and criticisms have been severe, mostly due to the lack of caution by its advocates, who tend to present it as a miracle solution (Fall and Lericollais 1992, Cornwall 1992, Olivier De Sardan 1995). The main problem is that these methods are supposed to help local people to express their demands autonomously, whereas in fact the facilitator always influences this formulation—often