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Participatory research and land use management in the Atlantic Rainforest Biosphere Reserve: the case of the tobacco farmers in Atalanta- Santa Catarina- Brazil

Beatrice Nowotnick

Brandenburg University of Technology Cottbus, Chair of Soil protection and recultivation, Faculty of Environmental Science, Germany. E-mail: beanowo@yahoo.de

Abstract

Brazil is the world's largest tobacco leaf exporter and the second biggest producer. Almost all of it is grown in the south of Brazil, including the state of Santa Catarina (SC). There, tobacco farming has established itself as the main "cash crop" of predominantly small-scale, family-run farms that are part of an integrated production system. This has been associated with land degradation, poverty and health problems. Although Brazil has enacted stringent environmental regulations, enforcement is extremely difficult because of the large number of tobacco farmers contributing to deforestation. The uncontrolled cutting down of native wood to cure tobacco is the major cause for man-induced land degradation in the region.

This study was carried out within the framework of reforestation activities performed, in Atalanta (SC), by APREMAVI, a local NGO promoting forest conservation by fostering alternative forms of land-use for rural landowners. Current land use management practices as well as farmers' living conditions were investigated in-depth. Socio-economic problems were assumed to be the fundamental root of environmental degradation. Therefore, emphasis was given to integrating social science components into research on land-use management in order to understand the social dynamics that underlie the process of degradation.

The study demonstrates that successful reforestation and land-use changes on private properties rely on active involvement of the beneficiaries in each step of the process. A dialogue between farmers, practitioners and environmental scientists in which the participants' problems, views, expectations, and fears are expressed is imperative.

Through this approach, a process of reciprocal trust, respect and learning set in motion farmers' self-critique and rethinking concerning the use and protection of private land in the Atlantic Rainforest. The main achievements of this work were the changes in attitudes of farmers that are prerequisites for a movement towards better socioeconomic and environmental conditions. Final recommendations on further research and suggestions for improving land-use management on the local level in the Atlantic Rainforest Biosphere Reserve are provided.

1. Introduction

Less than 2% of the territory of the southern Brazilian state of Santa Catarina is legally protected, which is an area insufficient to guarantee the preservation of its immense forest cover (Apremavi, 2005). Law enforcement is also difficult and many protected areas are protected in name only. Furthermore, legislation for private areas does not respond to the reality in which farmers are forced to exploit the forest for survival and have no financial means to restore it. The fact that, forest remnants in Santa Catarina are mainly located on small-scale farms, which make up more than 90% of the land under private ownership (Apremavi, 2005), indicates that landowners have major responsibility towards protection. Thus, the successful restoration of private land fundamentally relies on landowners' ability and commitment to it. Therefore, central to the debate about protection of the Atlantic Rainforest is not so much increasing the effectiveness of law enforcement or denouncing environmental offences but rather improving effectiveness in land-use management. Effectiveness calls for adapted research and a 'true' management approach that tackles the causes of land degradation and fundamentally involves all people concerned in the diagnosis of its causes. With the full participation of landowners in the process of finding and implementing practical solutions, a long-term success of land restoration is achievable.

According to Clayton¹ (2002), there is a particular need for applied socio-economic research and in-depth studies to promote development and better understanding of knowledge (views, perspectives, visions) of the people living in the Atlantic Rainforest Biosphere Reserve and look into situations at the very local level or farm level (Del Castello and Braun, 2006). A realistic approach is needed that focuses on considerably helping rural communities shifting their devastating land use practices and moving progressively towards sustainability. Seeing that the use of natural resources is determined by human society, it follows that attitudes and complex values of the human culture as well as relation to the environment need to be changed first and foremost. The very beginning of such a process requires identification of the complex socio-economic 'reality' of rural communities and mutual willingness for social interaction, collaboration and communication.

2. Research context

The studied rural communities are situated in Atalanta in the middle east of Santa Catarina state. The region includes watersheds of the Itajaí Acu River. The area is mountainous, climate is subtropical and vegetation is characterised preliminary by Araucaria (*Araucaria angustifolia*) forests which harbours a high biodiversity despite considerable destruction (Apremavi, 2005). Primary forests have been limited to areas that are difficult to access. Secondary forests are predominantly occurring on the private farmland and have a relatively low variety of animal and tree species due to the constant extraction of firewood for curing tobacco leaves. There is ample evidence of soil erosion and decline in soil fertility. Most of the communities and farmlands are located near water sources. More than 50% of river and stream banks have been left bare of vegetation (Apremavi, 2005). Additionally, the excessive and blindfold use of pesticides in tobacco cultivation causes serious contamination affecting water quality and human health

¹ President of the national council of the Mata Atlantica Biosphere Reserve

(Christian Aid, 2002). Another problem that was observed with tobacco farmers in the region is their poor living conditions. Farmlands appeared to be disorganized and unable to supply themselves with self-grown food (purchasing it in the supermarket). In short, tobacco farming has been responsible for deteriorating these people's environment and livelihoods. These circumstances led local conservationists (APREMAVI²) in 2005 to start a project called "Planning Farmlands and Landscapes" in collaboration with EPAGRI³ and sponsored by national foundations. The project offered most impoverished tobacco farmers in Atalanta to improve conditions on their properties by reforestation measures.

In this context the author observed that reluctance to interact socially constrained the progress of the project and accordingly the on-farm implementation. Due to poor communication between members of APREMAVI and the local farmers, the latter were not aware of the project's objectives. This made them acting in a way that signified aloofness and distrust and thus impeded farmers from participating in the project. Thus, farmer's real needs could not be identified.

3. Research objectives and questions

The overall aim of the project was to restore damaged farmlands by recuperating riparian vegetation and degraded areas with native tree species as well as enriching secondary forests. Initially fruit trees were distributed to the farmers in order to diversify tobacco monoculture, to offer farmers a future alternative income possibility and to encourage more environmental practices. Additional incentives were given for experimenting with organic agriculture and extending or rather creating vegetable gardens for own supply, what is associated with amelioration of living conditions.

In order for the reforestation measures to be effective, it appeared indispensable to take a people-oriented approach in order to understand the reasons for land degradation. Hence, learning about farmer's cultural and socio-economic situation was done by investigating farmers in their natural setting. This was achieved by perceiving relations among farmers themselves, between farmers and their physical environment, between farmers and local development objectives, as well as carefully watching both the author's ability to communicate well and the farmers' reactions. Studying farmers' interests, knowledge, problems, viewpoints, expectations and fears are fundamental to establish a realistic and qualitative representation of the present land-use situation and to find practical solutions. Main research questions are:

- How does tobacco farming affect the environment and farmers' livelihoods?
- Why do farmers in Atalanta grow tobacco and where do they see the profit in it?
- How do farmers perceive changes in the condition of their natural environment?
- How do members of the community socially interact, in particular farmers and the staff of APREMAVI?
- What are farmers' perceptions and expectations regarding the project?
- How can they benefit from research activities and find new perspectives for local development?

² The Upper Itajai Valley Environmental Preservation Association

³ Agricultural Research and Rural Extension Institute

4. Methodology

“The subject cannot think alone, it is not possible to think without participation of others in the act of thinking about the object... The object, for this reason, is not the result of the subject’s thinking but the process of communication”

Paulo Freire⁴

This study links socio-economic research and land-use management at the very local level. A fruitful approach towards adaptive management and research and that copes well with the complex nature of this study was to look at it from a holistic perspective. That means the investigation is an iterative and transdisciplinary process based on interpersonal communication and intense dialogue between the researcher and the matter of research. Emphasis was given to motivating farmers to become active in every aspect of the research and management process, including on-farm planning, decision-making, and implementation of reforestation activities, as well as the formulation of research questions, collection and interpretation of data.

Participation was seen as most appropriate to obtain qualitative data about farmers’ knowledge and views. Qualitative research enables the researcher to obtain data that are difficult to access by quantitative methods. The aim of this study was not to produce a statistically applicable example of quantitative data.

Favourable conditions for conducting the study were created by taking part in APREMAVI’s project, i.e. by doing fieldwork and coordinating between project workers and farmers. Besides that, living in the natural setting during the entire process of investigation, a period of 5 months, was seen important in order to become an active participant in the community life and to establish relationships in a way that are supporting the research.

The project’s initial aim was to restore farmland of the 15 most impoverished families in different communities of Atalanta. All of these farms were characterised by tobacco monoculture, nearly totally cleared land and soil erosion, unprotected and contaminated water sources and a disordered farmstead. The available timeframe and the nature of the research enabled building up close contact to 6 families. The first challenge was to establish confidence and to create a cooperative environment. This required a high degree of commitment and daily travel to the respective farms, serving as listener rather than instructor, taking part in their daily work as a token of interest and willingness to learn from them. Right from the first meeting with the farmers, emphasis was given on making farmers feel at ease in the presence of ‘outsiders’ in their home and to adjust any project measures to their daily work routine. This was seen as the basis for collaborating successfully in the planning and implementation of the restoration measures and to ensure profound investigation of farmers living conditions through informal talks, observation, and semi-structured interviews.

⁴ Freire P. (1968) „Extension or Communication“, published in Freire P. (1973) Education for Critical Consciousness. New York, NY: Continuum International Publishing.

4.1 Participatory approach to land use management

The land-use management process itself can be characterized by spiralling cycles of non-linear relationships of each phase of the process (see figure below). A crucial part in the course of the project was social learning and joint reflection on the development of restoration activities. This was seen to be necessary in order to constantly consider farmers' feedbacks, respond to emerging problems and to encourage farmers in self-criticism. That means, besides monitoring the growth performance of the young native trees on the degraded land and other factors that determined the success of the restoration, also the relationship of the farmers with their environment was subject to monitoring or more precisely, how the project is being managed by the farmers and how farmers' attitudes are changing. The integration of social and environmental monitoring data was inevitable to provide a better comprehension of the system being studied.

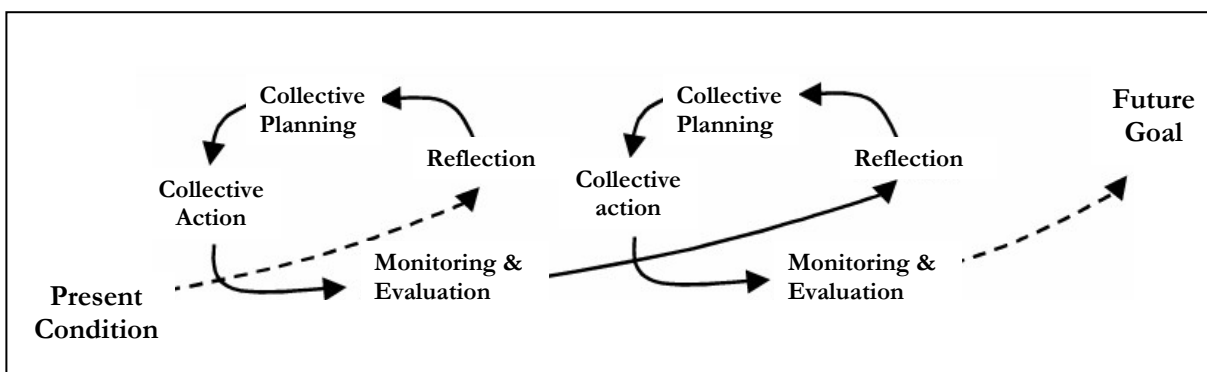


Figure: Development continuity of the investigation
Source: Partly adapted from Henderson, D. (2005)

4.2 Qualitative data collection and analysis

The process of data collection and analysis was based on “grounded theory” methodology introduced by Barney Glaser and Anselm Strauss (Strauss and Corbin, 1998), aiming to develop theoretical understanding of the situation from systematically gathered and analyzed qualitative data. Any preceding knowledge or understanding on the topic shaped the research questions, particularly in the initial phase. More profound and advanced understanding is gained after interpretation of initial data gathered so that further data collection could be guided by more specific research question. Understanding of the research object is shaped through this step-by-step procedure of data collection and interpretation. This process continues until profound understanding is attained where additional data collection does not lead to new discoveries.

The data was collected intuitively according to specific circumstances at the study site. Especially the interviews have been carried out spontaneously during fieldwork in order to maintain the setting as natural as possible. Tape recordings were used in order to ensure precise transcriptions of farmers' statements. Each session lasted 90 to 120 minutes and took place face-to-face as a group interview with 2 to 4 family members including children as it's the most natural form of interaction. Interview questions were conducted in an open way without fixed categories of answers in order to give the interview a rather conversational than interrogational character. Hence, the researcher did not have to prompt the discussion too much and a lot of topics emerged naturally.

5. Findings and project achievements

The socio-economic analysis of the interviewed farmers in Atalanta showed that the typical area used for tobacco cultivation on small-scale farms amounts to 3-6 ha with an average of 55,000 plants and is managed by a single family including the children. The annual net income of most families does not exceed R\$ 20,000. For a four-headed family this means approx. R\$ 400 for person/month. This is by no means enough to ensure the well being of the families.

All farmers are subject to strict contracts with one single tobacco company, Souza Cruz. Souza Cruz encourages farmers to purchase farming inputs (seeds, fertilizer and pesticides) from it by using a carefully controlled system (“integrated production system”) of loans and credit (Vargas, 2001). By setting unrealistic quality standards that farmers cannot reach, Souza Cruz deprives farmers of the real crop value. Since Farmers’ living expenses can not be covered, credit is paid off at the end of the year in tobacco. The result is that farmers are driven deeper and deeper into debt. In fear of losing their land to the company, farmers see no other choice than expanding the area under tobacco growth in order to repay debts one day. Thereby they even increase further their dependence on the tobacco business. They cannot escape this vicious circle by themselves and have very little chance to improve their situation economically and socially. They perceive that their fate is beyond their control which leads to frustration and desperation.

Despite all these facts, some farmers still see advantages in cultivating tobacco, because the purchase of the entire tobacco harvest is guaranteed by the contracts. The farmers’ greatest concerns are the health problems resulting from intoxications during many years of unprotected application of agrochemicals and physical collapse from exhaustive labour. Farmers are aware of the environmental change and land degradation that is caused by tobacco monoculture, but they don’t consider it highly important. Although farmers fear denouncements to state authority (IBAMA) whereupon high fines would be imposed on them, their poor conditions, lack of time and shortage of planted trees is not leaving other options than illegally cutting down native forest. All these facts show that farmers act under socio-economic pressure. They depend on deforestation for their survival which leads to environmental degradation and consequently to more poverty.

With respect to the restoration project, there were several problems impeding the progress and suppressing farmers’ willingness to participate. On the one hand, it was observed that there are problems of social interaction between the project workers and farmers. This might be due to the remoteness of the farms and the working hours of farmers on their fields that hampers establishing contact. Another explanation is cultural differentiation in the communities of Atalanta. It is worth noting that cultural differences of European origins, among them Germans and Polish, were preserved throughout many generations of social isolation. But the act of excluding each other leads to communicational problems and reluctance to genuinely respect each other. Combined with the fact that there exists status differences, the workers from APREMAVI take their way of thinking for granted and are mostly not willing to listen and learn from farmers. Thus, interaction problems lead to poor information exchange resulting in misunderstandings. When on-farm activities of the project have been going on already, farmers still completely misunderstood the activities of APREMAVI. They confused APREMAVI with IBAMA which penalizes farmers for environmental crimes. This caused enormous distrust and

additionally determined the degree to which farmers were willing to communicate. Further reason that complicated the project implementation was the season chosen. Planting trees and monitoring their growth is a time-consuming activity and was incompatible with tobacco farming activities.

After all, a deep understanding of farmer's conditions enabled to adjust project measures to farmers' daily routine and despite many constraints some farmers were very dedicated to support all steps of investigation and motivated to talk about their views, feelings, problems, and experiences. They showed trust in the benefits of the project. They got inspired and hopeful towards improved life-quality that created incentives for individual action and immediate conversion of ideas into practise. They began to see their responsibility for forest protection, in particular to ensure water availability.

Through joint efforts of farmers, the author and members of APREMAVI, the project introduced approximately 7,000 native seedlings on 15 degraded tobacco farms. Some farmers that took part in the investigation, even showed interest in experimenting with organic agriculture and expressed desire to gradually reduce area used for tobacco cultivation. Through a meeting that was organised in order to demonstrate project achievements to the public, other farmers that haven't been participating so far, became interested to take part as well. Consequently, the initial aim of restoring 15 farms was expanded and local firms agreed upon financial support.

6. Conclusions and recommendations

Right from the early stage of the investigation, it became obvious that farmers' willingness to participate in the project was restrained by several factors. Hereunder were farmers' misunderstandings and distrust in the purpose of the undertaking. Intense dialogue was most appropriate in resolving misunderstandings, encouraging local people and creating motivation to become active partners in the project. Full adjustment of project measures to farmers working routine enhanced farmers' commitment. The author's willingness to fully understand the farmers enabled a thorough analyzes of farmers' perceptions and expectations.

The project induced the farmers to vision the transformation of their properties into a pleasant place to live. Furthermore, farmers saw a possibility of gradually reducing the area used for tobacco cultivation. This motivation led farmers to collaborate and to take action straight away. It resulted in the recuperation of riparian vegetation to protect water sources, the restoration of degraded areas, as well as the creation of home gardens.

This study showed that attempts to change land-use practices permanently succeed only when social processes can be transformed. The main achievements here were the changes in attitudes of farmers. A process of reciprocal trust, respect and learning set in motion farmers' self-criticism towards and re-thinking of their approach to nature protection. It helped farmers to start reflecting upon their visions to liberate themselves from the vicious circle of tobacco growth and self-destruction, and to start organise themselves, to make their homes worth living and to care more about self-nutrition, health, and environment. This would be an enduring procedure and requires regular environmental and social monitoring and inspiration from 'outside'.

Although some farmers did not agree to some solutions due to personal problems, others realised that they can already ameliorate their situation by simple low-cost measures without

external financial support. Those farmers laid the foundation by starting to grow organic vegetable and medicinal plants for their own consumption. An idea to construct a bamboo-yard in order to fence free-running chickens and enable vegetation growth was immediately accepted and replicated by neighbours.

The study demonstrates that successful reforestation and land-use changes on private properties rely on active involvement of the beneficiaries in each step of the process. A dialogue between farmers, practitioners and environmental scientists in which the participants' voice is heard is imperative.

The co-management by all stakeholders emphasises the need for changes in attitudes and behaviours of institutions like APREMAVI, to allow more people to learn and create knowledge together, through dialogue, collective inquiry, and shared power and responsibilities. In particular, NGOs should improve downward information transfer and their own ability to communicate well with local people. Furthermore it is suggested to invest in educating the young people in order to empower them to take control over their lives.

References

APREMAVI (2005) "Projeto planejando propriedades e paisagens", Programa de ecodesenvolvimento, Fundação o boticário de proteção à natureza

Clayton F. L. (2002) "Questionnaire for Biosphere Reserve Managers and Coordinators: Atlantic Forest Biosphere Reserve" MaB Task Force on the development of quality economies in biosphere reserves.

http://www.unesco.org/mab/BRs/q_e/questionnaires/QuestBrazil.pdf online retrieved

Christian Aid (NGO)/DESER (2002) "Hooked on tobacco", Report on British American Tobacco subsidiary, Souza Cruz

<http://www.christian-aid.org.uk/indepth/0201bat/bat1.htm> online retrieved

Del Castello, R. and P.M. Braun (2006) "Framework on Effective Rural communication for development", GTZ and FAO, Rome, Italy

Henderson, D. (2005) 'Participatory Research and Development for Sustainable Agriculture and Natural Resources Management: A Sourcebook'

Strauss A. and J. Corbin (1998), "Basics of qualitative research", 2nd edition, Sage Publications

Vargas M. A. (2001) "Forms of governance, learning mechanisms and upgrading strategies in the Tobacco cluster in Rio Pardo Valley- Brazil."

<http://in3.dem.ist.utl.pt/downloads/cur2000/papers/S22p05.pdf> online retrieved