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6 Towards Local Management of Natural Resources in Senegal

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INTRODUCTION

Environmental problems in Africa have become so widespread and severe that any solution to them excluding consultation with and involvement of the rural population is unrealistic. Rural communities must be allowed and encouraged to become responsible for the sustainable management of nature and natural resources on their own territories. This idea has been diffused in many African countries including Senegal. In this country many efforts towards social forestry have been made since the beginning of the 1980s. This means that the rural populations have been stimulated to actively manage forests and trees and to use land sustainably.

At the end of the 1980s, however, it was found that the participation of the rural population fell far short of the original expectations of the forestry projects (Fall et al., 1988; Gueye and Laban, 1990). Several structural impediments are to blame for these disappointing results. Notwithstanding these structural barriers, however, a number of activities were engaged in locally, at least to some extent. This brings us to the two questions we would like to answer in this chapter:

- how does the local rural population explain the disappointing reaction to the appeal of the forestry projects to plant and protect, and
- what reasons does the local population have to still participate to some extent?

From the very formulation of these questions it is clear that we are interested in the views and comments of the rural people themselves, that is in local knowledge. This means that in this chapter we will discuss only those contributing factors that have been identified by the rural population. How the rural people evaluate a project and its innovative propositions seems to us

to be an essential question, for it is they who are the actors that decide whether or not to integrate new kinds of behaviour into their system of relations and activities.

This chapter is based mainly on a comparative study of the results of fieldwork carried out in 1988 and 1989, under our supervision, by undergraduate students of anthropology from Leiden University¹. At that time the preparations for new forestry policy and legislation had already been started by the Senegalese authorities (see Fall et al., 1988). In order to make a specific contribution to the discussions, the students focused their fieldwork on the views of rural people concerning the integration into local farming systems of the innovations proposed by the forestry projects. For our comparison of the viewpoints of the farmers we have mainly used reports from six villages². These villages are situated in different regions of Senegal and in the intervention zones of different social forestry projects:

- two villages in the North (Région de Saint Louis) and within the intervention zone of the PROGONA (Projet Bois de Villages et Reconstitution des Forêts Classées de Gonakié), which started its activities there in 1984;
- two villages in the West (Région de Thies) and within the intervention zone of the PREVINOPA (Projet de Reboisement Villageois dans le Nord-Ouest du Bassin Arachidier), which was introduced in 1986;
- and two villages in the East (Région de Tambacounda) and within the intervention zone of the PARCE (Projet d'Aménagement et de Reboisement des Forêts du Centre-Est), which began in 1986.

More detailed information about this research project and the six village studies can be found in van den Breemer et al. (1993).

Before discussing the local points of view which explain the disappointing—but nevertheless continuing—participation, it is necessary to give a brief overview of the aims and activities of the forestry organizations intervening in the social and economic life of the six villages.

AIMS AND ACTIVITIES OF THE INTERVENING ORGANIZATIONS

The organization which is by far the oldest and which is supposed to cover the whole territory of Senegal is the State Forest Service, Les Eaux et Forêts. For a long time this Service has had a twofold aim: on the one hand, the conservation of the State Forest Reserves (*forêts classées*) and the protection of certain trees and animals, and, on the other, the exploitation of these forests to satisfy the demand for wood and charcoal. The Forest Service has the task of keeping a stable balance between conservation and exploitation.

In order to protect forests and nature, the Service developed several kinds of activities in accordance with varying local circumstances:

- local committees were created and stimulated to prevent and combat bush fires;
- people were made aware of environmental problems and threats by providing useful information and organizing symbolical actions such as the annual planting day;
- energy-saving stoves and butane gas were introduced to reduce the demand for firewood and charcoal;
- nurseries were laid out to provide villages, associations or individuals with young trees, and the technical knowledge and skills for the planting and care of these young trees were transferred;
- wood lots, windbreaks and trees along the main roads were planted and 'vivres PAM' (foodstuffs from the World Food Project) were distributed to the local people to encourage their participation in conservation and reforestation;
- and, last but not least, legal regulations for the protection of forests and trees were enforced, and fines or imprisonment imposed when these regulations are violated.

Given the repressive nature of the national forest law which was in force until February 1993, it was precisely this last activity which gave the Forest Service the bad reputation of being a state agency exploiting and oppressing the rural farming population.

The second aim is to exploit the forests in order to provide charcoal and wood for construction and fuel. To this end, the Forest Service is permitted to grant, for payment and on condition that a certain area has been replanted, several kinds of concessions and licences. However, because there were not enough staff and means to cover the whole area of Senegal, the State Forest Service was unable to keep the right balance between conservation and exploitation. Exploitation, which satisfied urgent needs and was immediately rewarding, took precedence over conservation, with its long-term interests. Thus, much less effort was put into conservation than into exploitation.

In this situation of state-controlled forestry, several projects for social forestry have been started, among which are the three aforementioned. In contrast with the Forest Service, these projects have, for a restricted period of time, a limited intervention zone within which an attempt is made to arouse local people's interest in conservation and reforestation and stimulate them to take the responsibility for the sustainable use of trees and forests in their own hands.

Apart from differences in emphasis and elaboration, our three projects have much in common:

- They are intended to make the local people conscious of the threat of desertification, its causes (e.g. the local use of the woody vegetation) and

its consequences (e.g. a lack of wood and fuel and other forest and tree products; erosion and declining soil fertility).

- There is a desire to discuss possible solutions with the local people (e.g. regarding the protection or sustainable use of existing forests and trees; the use of energy-saving stoves; the planting of new trees to safeguard the provision of wood, fuel and fodder, break the force of the wind or prevent water erosion).
- They are intended to encourage local communities, groups or individuals to collectively organize the sustainable management of forests and trees.
- All three projects function in close cooperation with the State Forest Service and at least two of them (the PREVINOBA and PROGONA) explicitly formulate as one of their objectives the training and reinforcement of the Forest Service.

There are, of course, also considerable differences between the three projects.

The PARCE, which stopped its activities in 1990, seemed to take the village as the unit of action, whereas the other projects more often worked with associations within the village. The PARCE placed strong emphasis on the planting of village wood lots and on the prevention of bush fires. Notably, this project had quantitative goals (number of planted trees, of replanted hectares, etc.). In this respect, the PREVINOBA was at the other end of the continuum, attaching less importance to such quantitative results.

The PREVINOBA, moreover, was the sole project which had among its goals the advancement of sustainable land use and the battle against erosion. An appeal was made to the farmers to plant trees along and in their fields and to save the young *Acacia albida*'s when they were weeding. These trees do not compete with the surrounding crops and they may have a beneficial effect on the soil. In addition, the PREVINOBA attached great weight to making local people conscious of environmental problems in their own surroundings. At the time of the research, the PREVINOBA was the sole project that made use of the GRAAP extension method³. In contrast to the other projects, the PREVINOBA seems to have put more effort into the promotion of agro-forestry by giving support to the laying-out of vegetable gardens, mostly by women's associations. The project was, as far as we know, the first one to abolish the food distribution ('vivres PAM') in order to eliminate wrong incentives to participate in forestry activities. Last but not least, the project took the participatory philosophy seriously—with considerable success in some villages—and devoted much attention to the barriers local communities or groups had to overcome before being able to sustainably use and manage their natural resources themselves.

The PROGONA in the Senegal valley differed from the other two projects in at least one respect, that is one of its main objectives was the conservation of a large number of State Forest Reserves. These forests, if they had not yet completely disappeared, were seriously threatened. Unfortunately, in its initial

phase the project decided, without having consulted the local authorities—and therefore in contradiction with its own participatory philosophy—to completely fence off considerable parts of some of the forest reserves. Consequently, any form of use by the local farmers and herdsmen was excluded.

From this overview of aims and activities (for more details see van den Breemer et al., 1993) one further common characteristic of these projects emerges, namely that they are forestry projects. This means that they all made an effort to induce people to plant and save trees and to conserve forests, in other words, to convince them of the importance of the woody vegetation.

UNSATISFACTORY PARTICIPATION

From our comparison of the six case studies, it became evident that a combination of mainly three factors must be held responsible for the poor participation of the rural people:

- the rather negative local views on government interventions in the rural use of forests and trees and the subsequent identification of forestry projects with the intervening state organism, i.e. the Forest Service (Les Eaux et Forêts);
- the local views on the economic situation and on the profitability of forestry activities;
- the local interpretations of the causes of the environmental problem; in other words, who is held responsible for the problem.

Sometimes also notions of local political relationships are reported as contributing to poor participation.

Local views on governmental interventions in the use of forests and trees

By governmental interventions we mean here the imposition, by the Forest Service, of the national legal regulations for the use of forests and trees. In the research villages of the North and the West the people's ratings of the Forest Service and its activities are generally very low. In the villages near Tambacounda, however, the Forest Service is—at least for the local elite—a powerful governmental organization with which it might be worthwhile to maintain good relations.

In both villages in the North the Forest Service is held responsible for the creation of a State Forest Reserve (*forêt classée*) in 1942, that is for the withdrawal of a very large part of the village's territories from local authority and use. Moreover, the Forest Service later granted concessions to outside entrepreneurs for large-scale commercial exploitation (the felling of trees and

charcoal production). The result was nearly complete deforestation of large parts of the State Forest Reserve, while the revenues of this exploitation went to the State, the Forest Service and outside entrepreneurs and not to the villagers. In addition, the Forest Service continued to thwart the villagers' use of the forest in several ways. Unfortunately, the social forestry project (PROGONA) which started in the mid-1980s became identified with this hated Forest Service, at first because it fenced off large parts of the forest without consulting the local authorities. More fundamentally, this identification seems to arise from one of the objectives of the project itself, namely to support and reinforce the country's existing governmental structures, i.e. the Forest Service.

In both villages of the West people feel frustrated and indignant about the Forest Service, mostly because of its rigorous inspections and the imposition of fines for the felling of trees or the cutting of branches, even when these trees have been planted by the people themselves. The Forest Service is regarded as a state organ interested in collecting financial revenues at the expense of the farmers. Here, too, the social forestry project (PREVINOBA) has, to some extent, become identified with the Forest Service. This identification is clearly unfavourable for the project's appeal to the rural people to invest in reforestation and protection.

In the villages near Tambacounda the Forest Service is regarded differently. It is thought of there as an organ authorized by the State to provide a limited number of licences for the production and trade of charcoal. In the eyes of the local elite it is necessary to keep up good relations with this organization for these give access to big money. Not surprisingly, the appeal for reforestation made by the Forest Service has some effect on those who want to keep or be granted a permit to produce charcoal. The result is a certain *pro forma* participation in planting activities. Among the farming population in general, the Forest Service is regarded as a state organ, which is responsible for the nearly complete deforestation of large areas removed from the jurisdiction of the local communities and as one of the main beneficiaries of this exploitation. Clearly this view is not favourable to participation of local communities in forestry activities.

Local views on the economic situation and on the profitability of forestry activities

In all the research villages people saw themselves confronted with decreasing local opportunities to earn a living and with the increasing importance of emigration and off-farm activities. In the villages of the North and the West the situation was even described as having deteriorated dramatically.

In the villages of the North rain-fed agriculture has completely disappeared because of insufficient rainfall, while flood-recession agriculture has greatly diminished. Livestock numbers have been greatly reduced and the exchange

with transhumant cattle-herders and fishermen has practically vanished⁴. Local charcoal production has been forbidden and severely sanctioned by the Forest Service. The recently introduced irrigation agriculture has brought some relief, but puts financial pressure on the participating households. Irrigation can only be practised with the help of financial revenues from the emigrants. But this implies a loss of good labour forces. Under these circumstances hardly any labour can be made available for reforestation and conservation. Every effort must be concentrated on the first necessities of life. Activities in the tree nursery and the village wood lot are considered to be matters of minor importance because they do not immediately contribute to meeting urgent needs.

The villages in the West present a similar picture of catastrophic development. Rainfall, vegetation and soil fertility have decreased. Firewood and timber have become scarce. Artificial fertilizer has become too expensive since government subsidies and credits have been stopped. Decreasing agricultural output and revenue, seasonal food shortages, the decrease in livestock, droughts and incidental swarms of locusts are forcing more and more people to emigrate and do off-farm work and, consequently, to withdraw from the agricultural production process. Immediate safeguarding of the food supply is the first priority. Long-term investments in soil or trees would in fact endanger the food supply.

In the villages near Tambacounda economic problems and instability in income occur as well, but not to such a dramatic extent as in the North and the West. What distinguishes the villages near Tambacounda is that in these villages economic circumstances are not yet critical, simply because there are still woodlands. This implies that forest products and tree products are still available to some extent and that many people earn an additional income from the exploitation of the forest, i.e. from charcoal production and trade and related activities⁵. For many people forest exploitation is, directly or indirectly, an effective means to alleviate their economic problems: it yields money immediately, which is certainly not true of investments in forests and trees. In brief, without the presence of forests and trees near Tambacounda, important means of earning money quickly would be lacking and many people would be faced with serious economic problems.

Local interpretations of the causes of environmental problems

Local views on the causes of environmental problems show some differentiation, depending on the specific local circumstances and problems. We will discuss the most general causes only.

The most general reason given for the degradation of the vegetation and the decreasing fertility of the soil was the change in rainfall: it rained less and more irregularly than before. This is seen as an act of God, however. When God decides to let it rain again, vegetation and fertility will return. This view

seems to prevail in the North, but can also be found throughout the rest of Senegal.

The second frequently given reason for environmental problems has to do with the role of the Government. In the North and the East the Forest Service is blamed for the decline in forests and forest products. In the West, the loss of soil fertility is attributed to the subsidy stop by the Government for artificial manure; many farmers can no longer afford to buy it.

Thus, a predominantly religious and political point of view about the causes of environmental problems prevails. From this standpoint efforts made by man to invest in the protection and re-establishment of the vegetation cover are unnecessary, improper and, as far as they concern the Government, foolish. An exception is made for the planting of fruit trees and hedges around gardens, because this contributes towards meeting the urgent need for food and money.

Notions about local political relationships

Local power relations may hamper or stimulate participation in forestry activities. Our case studies show examples of both kinds of influence.

Examples of an impeding influence are given by the villages of the West. There participation in reforestation was found to correspond with safe access to land. Those who have secure access (the heads of the compounds), plant and protect trees on or along their farms. Those who have not gained full rights to land use (e.g. the young men) either do not plant trees, or organize themselves first and then plant collectively (the women). Another example comes from a village near Tambacounda. Here, the local elite, among whom are noblemen who traditionally had access to the labour of their subordinates, tried to persuade their people to contribute to the planting of wood lots. This elite, who had been granted permits by the State Forest Service to commercially exploit the forest (for charcoal production), used these wood lots to keep their permits. Under the changing social stratification and the pursuit of emancipation, the appeal by the local elite indeed led to the planting of trees, but this was done badly.

Our comparison of the village studies has thus led to the identification of structural impediments to rural participation as local people in different parts of Senegal see them. In spite of these barriers, the people in our villages and in many others did not totally refuse the innovations, but put some of them into practice, i.e. they invested some labour and land in applying some innovations.

WHY IS THERE STILL SOME LOCAL PARTICIPATION?

Given these structural barriers to local participation, the question of why people nevertheless participated to some extent becomes more probing.

In the villages of the North and the West a general interest exists in the planting of fruit trees and the establishment of green hedges around and in vegetable gardens (for protection against cattle and as a windbreak, etc.). The objectives are generally to generate financial income and safeguard the food supply. These objectives have priority for almost all of the villagers. Innovations proposed by the project that do not quickly contribute towards alleviating these needs have less chance of being put into practice, unless they serve other objectives of the villagers. For instance, for one village of the West the researcher came to the conclusion that the attitude towards the project was ambiguous: on the one hand, people felt distrust towards the project and the Forest Service, but, on the other hand, they wanted to participate to some extent in order to stand a better chance of eventually becoming involved in other, more interesting projects. Some also used their participation to put pressure on the project's staff to help settle problems with the authorities. In one village of the North participation was characterized by the very poor manner in which the activities were carried out. Although the villagers agreed to engage in these activities, they carried them out badly (extremely marginal land, bad care of the young trees and vulnerable fruit trees used as windbreaks, etc.). The researcher came to the conclusion that this neglect was a sign of protest against the 'alienation' of their forest by the State. Nevertheless, by participating, the villagers keep the doors to the project and the authorities open.

In the villages near Tambacounda, too, people are very interested in the planting of fruit trees and hedges around gardens (small-scale agro-forestry) and their prime motivation is also to safeguard, in the short term, their income in kind (food) and money. However, some villagers are keen to plant wood lots as a means, imposed by the Forest Service, to acquire, maintain or expand their licence for the commercial exploitation of the forest. Another important reason for tree-planting is probably political. In many villages near Tambacounda wood lots have been established in places which are directly visible from the main road. Sometimes the trees that were already there were first removed. In other words, (a part of) the village wants to demonstrate publicly that it has answered the appeal made to them by the Government and the dominant political party. In one of the research villages no less than six reforestation initiatives had been taken and were in progress during the research period. Two of these were being put into practice by groups of men around two local politicians. Other initiatives were taken as part of an effort, by individuals and groups, towards social and political emancipation.

In short, people do participate in forestry activities when these bring food security and the guarantee of a higher financial income; when they may lead to a permit for the commercial exploitation of forests and trees; or when they may strengthen political ties which, eventually, may offer more interesting opportunities. The conservation of nature and natural resources is not one of

the dominant motives at the moment. Given the economic circumstances of a large number of people this could hardly be otherwise.

We therefore have some grounds for supposing that, until now, local participation in reforestation has mostly been a political issue. International donors have great difficulty in accepting the commercial over-exploitation of the forest and the charcoal production and trade, and they welcome national efforts at sustainable exploitation. Therefore, national authorities try to conceal over-exploitation and are eager to show successful reforestation and forest recovery. This attitude has its effects at the local level. People at the village level, despite objections to the state intervention, survival problems and different views on the causes of environmental problems, want to participate to some extent in forestry activities as an investment in political relations which may eventually lead to something more interesting than reforestation. In our view, this hypothesis is not unfounded but still needs further testing and elaboration.

This political motivation to participate in forestry activities seems unavoidable for the time being. Instead of rejecting it from the start, this typical channel could perhaps be used to stimulate the diffusion of successful small-scale forms of forestry and sustainable use of land and forests. Simultaneously, the Government must be assisted in creating the conditions which make planting and protection economically more interesting for the rural population.

CONSIDERATIONS AND RECOMMENDATIONS FOR POLICIES AND RESEARCH

What are the lessons to be learned from the aforementioned points of view expressed by the rural population? A very general but not unimportant point is that local people, in discussing rural reactions to forestry projects, not only draw our attention to local economic and political circumstances, but also to the supralocal level and a contradiction at this level: this level, for good reasons, summons the local, rural population to contribute to the protection and restoration of the vegetation cover, whereas, on the other hand, it upholds barriers to rural participation. The rural people were, in our view, attempting to express the fact (in 1989) that much more attention should be paid to the influence of the supralocal level.

The first supralocal barrier is the continual intervention, based on the forestry law and other governmental regulations, of the State Forest Service. On the basis of these laws and regulations, the Forest Service not only continues to withhold forest reserves from the local communities, but also favours the State and outsiders at the expense of the local farmers, whose rights to land, forests and trees remain insecure. Moreover, the latter have to buy licences to use trees which they themselves have planted and run the risk of being fined in the case of exploitation without a permit. Consequently,

apart from the usual project activities at the local level, efforts should be made—at the national level—to modify existing laws in such a way that the rights of the State, the Forest Service and the non-residents to land, forests and trees are restricted in favour of the rights of the local communities and their inhabitants. For instance, the latter could be given a decisive voice in the assignment of permits for the commercial exploitation of local forests within a fixed quatum, as well as in the imposition of fines for infringements. Part of the revenues could be reserved for allocation to local ends. The task of the Forest Service would then be expanded to include assistance to the local communities in protecting their rights against intrusion from outside.

In the meantime, the Senegalese authorities have become well aware of this legal barrier to local participation and of the necessity to formulate a new forestry policy. This awareness led to the presentation of the Forestry Action Plan (le Plan d'Action Forestier) in October 1992. This plan proposes a strategy for the development of the forest sector based on administrative decentralization, social forestry and a participatory approach. To that end, it is considered necessary to modify and harmonize some of the existing laws and legal regulations, such as the forest law (le Code Forestier), the land tenure law (la Loi sur le Domaine National) and the law for administrative reform (la Loi sur la Réforme Administrative). Subsequently, a new forestry law was accepted in February 1993. According to the Explanatory Memorandum about this new law (l'Exposé des Motifs accompagnant le Projet de Loi portant Code Forestier) the main modifications are related to:

- (1) the recognition of property and of the rights of private persons to enjoy the fruits of their own accomplishments (with the exclusion of the land on which they grew their trees);
- (2) the possibility for the forestry authorities to delegate the management of part of the State Forest Reserves to local communities in accordance with an approved local plan for management;
- (3) the obligation for the proprietors or users to manage forests and trees in a rational way, that is by avoiding overexploitation and by contributing to reforestation;
- (4) repayment of a part of the national fund for forestry, established by the revenues from exploitation concessions and other licences, to the local community.

With regard to the national land tenure law, mention must be made of an advertisement placed by the World Bank in 1992 for a research project which is intended to lead to a national land tenure plan (Plan d'Action Foncier). In this plan the land tenure policy must be redefined in such a way that legal rights to land are ensured for local communities and people, one of the conditions for sustainable local use and management of the natural resources.

A delicate problem in these endeavours towards decentralization is how to

define the 'local community'. In forest conservation the term 'local community' often does not apply to a single village, because a number of villages may claim access or rights to the same forest. The problem is how to select one village without discouraging the others. Consequently, it seems preferable to refer to 'the local community' as the group of villages and settlements belonging to the same municipality (*communauté rurale*), but this may pose the same problem or create new ones⁶.

Another supralocal barrier to rural participation is the pricing policy of the Government. Many rural households see themselves faced with a growing discrepancy between needs and means and therefore have serious economic problems. Participation in forestry activities (planting and conservation) is generally considered to be unrewarding and even to aggravate the economic problems of many households. If one really wants rural participation in forestry activities to reach the level of sustainable local management and exploitation of forests and trees, higher producer prices for wood and charcoal are one of the necessary conditions. As subsidies are impossible, there is, for the time being, no other economic solution than to raise consumer prices. Protection and re-establishment of the vegetation cover is a national affair, which is not only the responsibility of the rural population, but also that of urban households and enterprises. It must be examined to what extent, and in what way, the urban consumers and the charcoal trade can contribute to a higher local producer price. This will make sustainable exploitation of forests and trees an economically interesting business for local communities and individuals. However, the effects of a modified pricing policy on the productive behaviour of the rural population must first be tested.

The third barrier to participation in planting and protection is of a quite different nature. It is the religious belief that the change in rainfall patterns is God's will and that when God wants it to rain again the woody vegetation will come back automatically. Human intervention in restoring the vegetation cover is superfluous and even against the will of God. Given this view, it seems necessary to have professional theological discussions with the religious leaders in Senegal about man's responsibility for God's creations. Perhaps arguments can be found which may stimulate people to sustainably use and conserve nature and natural resources for religious reasons. However, the development of such an 'ecological theology' can be effective only if the State at the same time provides legal security for, and gives more legal powers to, the local communities and sets a stimulating price for the local producers-conservationists.

What seems to be most important is a radical change in the agricultural practices of the Mourides (one of the grand Islamic brotherhoods in Senegal), which have substantially contributed to the rapid degradation of the environment. Since early colonial times, the Mourides have steadily colonized the interior of Senegal by creating large groundnut farms, the harvests from

which went to the marabouts. Assisted by the colonial as well as the post-colonial authorities, the marabouts could appropriate new lands while leaving their old farms depleted. A recent and dramatic example is the destruction of the forest of Mbegué in 1991. The *khalif général* of the Mourides was authorized to clear a forest area of 45 000 ha for the cultivation of groundnuts. He even received help from several governmental agencies (Schoonmaker-Freudenberger, 1991).

Finally, we come to the hypothesis that local participation in forestry activities serves to maintain political relations which may eventually bring other, more interesting opportunities. Consequently, these activities have, at least initially, less to do with sustainable exploitation than with politics, which subjects them to the vicissitudes of this domain. On the supralocal level, too, political relationships and interests play an important role, e.g. to modify the law, to establish other pricing policies, or to involve the religious leaders of the different Islamic brotherhoods. Therefore it is not enough for the discipline of social forestry to focus research on the rural communities and farming systems. It must also have a real knowledge of the national political relationships and their developments, constraints and opportunities.

NOTES

1. The department of cultural anthropology and sociology of non-western societies at the University of Leiden organizes a research-training project in Senegal and The Gambia every year, from June to September. Students interested in social forestry focus their research on rural people's views about the desired integration of forestry innovations in the village and the household, that is in the local socio-agrarian system. Research has been carried out in this way in nine villages in Senegal over the years 1988-1991. After the research reports of 1988 and 1989 were completed, the students were asked to summarize their findings in about 10 pages. Their papers were discussed during and after a workshop which was held on 8 May 1991. Six papers were selected for publication in a volume edited by van den Breemer, Bergh and Hesselting (1993). This paper results from a comparative study of the six village studies.
2. The names of these six villages and the student reports are as follows: *Diarra* (Région de Saint Louis), Kautz and Vermeij, 1989; *Lydoubé* (Région de Saint Louis), Kautz and Vermeij, 1989; *Mborme* (Région de Thies), Klaus, 1990; *Ndoukoumane Ndiaye* (Région de Thies), Biesbrouck, 1990; *Koumpentoum* (near Tambacounda), van Est, 1989; *Kottari* (near Tambacounda), Companjen, 1988.
3. The extension method called GRAAP received its name from the group in Burkina Faso who developed it, namely the 'Groupe de Recherche et d'Appui à l'Autopromotion Paysanne'. It is a method to make the local population receptive and to mobilize them by eliciting discussions between the extension officers and the local people by means of specially designed colour-drawings. In this way, the local population can first analyse its own circumstances and identify its own problems and then choose its development goals and the ways to achieve them.
4. The research in northern Senegal was carried out before the conflict between Senegal and Mauritania in 1989. This conflict contributed to the deterioration of the situation in the region.

5. On this matter the data from our research villages near Tambacounda are different from Ribot's general statement that the charcoal workers and their patrons are all Fulbes from Guinea (Bergeret and Ribot, 1990: 156-157). Although this is often the case, there were autochthonous patrons and workers in our research villages.
6. This question was the main theme at a conference on local management of natural resources organized at the University of Saint Louis, Senegal, in November 1992. The participants, research officers as well as civil servants, came to the conclusion that:
 - it is necessary, for the purpose of sustainable use and management of natural resources, to redefine the competences of the State and the local communities;
 - the management of natural resources is a matter of triangular partnership between the State, the municipalities and the local population;
 - when the municipalities are the appropriate geographical units for the management of natural resources (which is not always the case), the councils of these municipalities should be given the necessary financial, institutional and legal means to reinforce their powers.

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