



COLLABORATIVE MANAGEMENT FOR SUSTAINABLE DEVELOPMENT OF NATURAL FORESTS IN SUDAN: CASE STUDY OF ELRAWASHDA AND ELAIN NATURAL FORESTS RESERVES

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Abstract

This research tries to examine pilot projects activities in the forest reserves based on collaborative management. The paper explores how the management system is attempting to integrate the trust concept to communities' continuing protection of the forest resources base. The paper also examines the social and economic impacts of the management system and its impact on sustainable production. Two forests reserves sites at Kordofan and Elgedaref states of Sudan were selected. A social Survey was carried out and respondents were selected randomly. A questionnaire was designed and used for data collection. This method followed by participants' observations, participatory rapid appraisal and review of the documentary sources. Calculation of the percentages and Chi-square test were used as analytical tools. The study shows that collaborative forest management in Elain and Elrawashda represents a progressive shift towards state recognition of the interdependence between the well being of forests and the well being of local people for subsistence and livelihood needs. Local community institutions are protecting the forest more effectively. Results reveal that the system succeeded in testing the provision of 1989 Forest Act, which allows people or communities to privately control areas of woodlands. It has gone beyond securing rights for local people and helps them to develop management plans. It succeeded in carrying other related forestry activities, which generate income. It succeeded in benefits' sharing arrangement and motivates villagers to participate. The findings show that the case of Elain and Elrawashda forest reserves management provides a promising example for participatory management.

Keywords: forest management, conservation, rehabilitation, development, sustainability.

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Introduction

Communal management has remained an important option for a great number of communities, and it continues to be a potential strategy for the conservation and sustainable use of large parts of the world's forests (Arnold 1998, Wily 2002, Wellstead *et al.* 2003). The challenges are to enable both local people and the nation to obtain goods and services that improve livelihoods, without compromising long-term resource and development goals (FAO 2003). The needs to confront these challenges have taken on a new urgency due to the surge of interests in decentralization. At the same time, changes in ownership and control systems are being considered for vast areas of forest, and new forms of joint forest management are emerging (IAC 1994). Hence, collaborative forest management is essentially a new management paradigm, developed from the late 1970s onwards. It seeks to draw on the experience and knowledge of both professional foresters and local people (whether already implementing a form of indigenous forest management or not) - in a partnership arrangement that may also involve other stakeholders (Carter 1999).

Indigenous societies form a distinct group among local resource users (Western & Wright 1994). Moreover, tools such as stakeholder analysis have revealed that interested parties in the management of a given forest may extend well beyond the Forest Department and local residents. Potential other stakeholders include groups such as seasonal migrants, distantly based collectors of specific forest products, forest products merchants, miners, sellers, logging companies, pharmaceutical companies, national and international NGOs, bilateral and multilateral donors, other government ministries and departments, etc. (Carter 1999, Elhassn 2000). Furthermore, the assumption that forest should be managed by governmental forest services was reappraised and a need was identified to complement the strategies of forest development based on national interests with new strategies focusing on basic needs, equity and popular participation (World Bank 1978, FAO 1987 cited by Wiersum 1995, Carter 1999, Wily 2002). The commonly agreed characteristics of all such approaches are that the local people are capable of undertaking a useful role in forest management, and have a legitimate right to participate (Thomson & Coulibaly 1995). Kobbail (1996), FAO (1998), and Elsidig *et al.* (2001) mentioned that sustainability of forest management depends upon having local communities work together with government agencies, concession holders, NGOs and other institutions involved in forest management in assessing, planning and monitoring management operations according to locally defined concerns, needs and goals. The aim is to get rural communities, government agencies and forest managers to work together.

Despite initial skepticism that forest resources in poor regions could ever be managed sustainably (Gordon 1954, Hardin 1968), there is now a vast

literature which suggests that suitable institutional frameworks can be designed to secure beneficial outcomes for stakeholders. Linked to this is a growing appreciation that sustainable resource management can go hand-in-hand with poverty alleviation (Jodha 1986, 1992; Kumar *et al.* 2000; World Bank 2001) and that the effectiveness of government as a resource manager is improved when it shares powers with different user groups. It is fair to say, indeed, that there has been a revolution in the philosophy of forest resources management over the past 20 years. Co-management of government forests by a joint body of government staff and forest fringe villagers under various cost-benefit sharing arrangements is becoming the standard practice. It is said that co-managed systems are more efficient since they can utilize the local maps of poverty and ecology available with the users. It is reasonable to argue that forest user groups are depositories of information about local forest stocks and agreed procedures for access and use (Jewitt 1996).

Until the mid 1980s, the majority of the forestry programmes in Sudan were primarily concerned with reservation and reforestation, mostly without involving villagers in those areas. After the catastrophic drought of 1984/85 forestry authority realized without other actors participation, they would not be able to reforest and manage sufficient land to provide the needs of Sudanese people for forest products and services. This required a sharing of responsibilities and a new social contract between governments and local communities. On the other hand there was a growing understanding among government officials that the management of forest resources need to complement the strategies of natural resource development, based on national interests with new strategies focusing on basic needs, equity and popular participation. In fact government and local people are becoming aware about the critical situation and its future consequences and the importance of tree conservation and protection. Assisted by good extension work organized by government institutions and foreign funded projects, people started to show interests in participating and getting involved in protection and rehabilitation of their immediate environment. People's participation in forest management and protection is proving to be more sustainable. Elain forest conservation, Elrawashda forest rehabilitation and other projects are good examples but are still pilot. The aim this research is an attempt to assess and analyze the management system and its impact on sustainable production.

Objectives of the Study

The main objective of this paper is to examine pilot project activities in Elrawashda and Elain natural forest reserves based on collaborative management. The form, impact and trend of the management system will be discussed.

Research Hypotheses

In order to achieve this objective the following hypotheses is proposed: Rehabilitation and conservation approaches based on collaborative management constitute the means for sustainable management, and environmental improvement.

Research Methods

Data Sources

The data were collected from both primary and secondary sources. Data from secondary sources were obtained largely through the analysis of various documents relevant to the study. This includes institutional reports, records and papers which provide baseline information for the study. The institutions from which the secondary data were collected are directly involved in the study, such as Forest National Corporation, SOS Sahel, and Agricultural Development for East Sudan (ADES), FAO, Social Research Statistic, and Agricultural Departments. Also information was obtained from reports and files found at Elgedaref and Elobied Area and Rural Councils. Primary data were obtained through structured personal face to face interviews and participatory rural appraisal (PRA) with the selected members of the local community and foresters. A questionnaire was designed to collect primary data for collaborative forest management. The questionnaire was administered to the people who participated in forest management and those who are not participating in forest management but live in villages where collaboration took place. The questionnaire was first pre-tested to explore their relevancy for the respondents. The needed modifications were made and the questionnaire was prepared in its final forms. The questionnaires was designed to obtain information on personal characteristics of the respondents, description of the management systems and its trends, awareness of forest importance and training and extension provided to the respondents. Check lists for Forest National Corporation (FNC) staff, FNC/SOS project managers and forestry researchers were developed with the objective of collecting information about policies, legislation, management system, constraints and research needed. This is to explore the views of the officers on the different issues discussed with the local community members with a reasonable depth since the officers and researchers have the insights to verify the different aspects in the study area and link them to scientific facts. Interviews were held with several key informants from FNC (staff), FNC/SOS project (staff), and Forest Research Corporation (FRC) staff in the two locations. Interviews were also subsequently held in Khartoum with the general manager of FNC and executive manager of the Sudanese Society for Social Forestry (SFSS). All interviews with respondents were carried out in Arabic although the questionnaires were set-up in English. Each interview took approximately 30-

50 minutes. These interviews were accompanied by personal observations, which allowed the author to judge the reliability of the answers given. In all selected villages the village leader was the first to be approached and talked to about the purpose of the visit and the study to get permission to carry out interviews with the respondents.

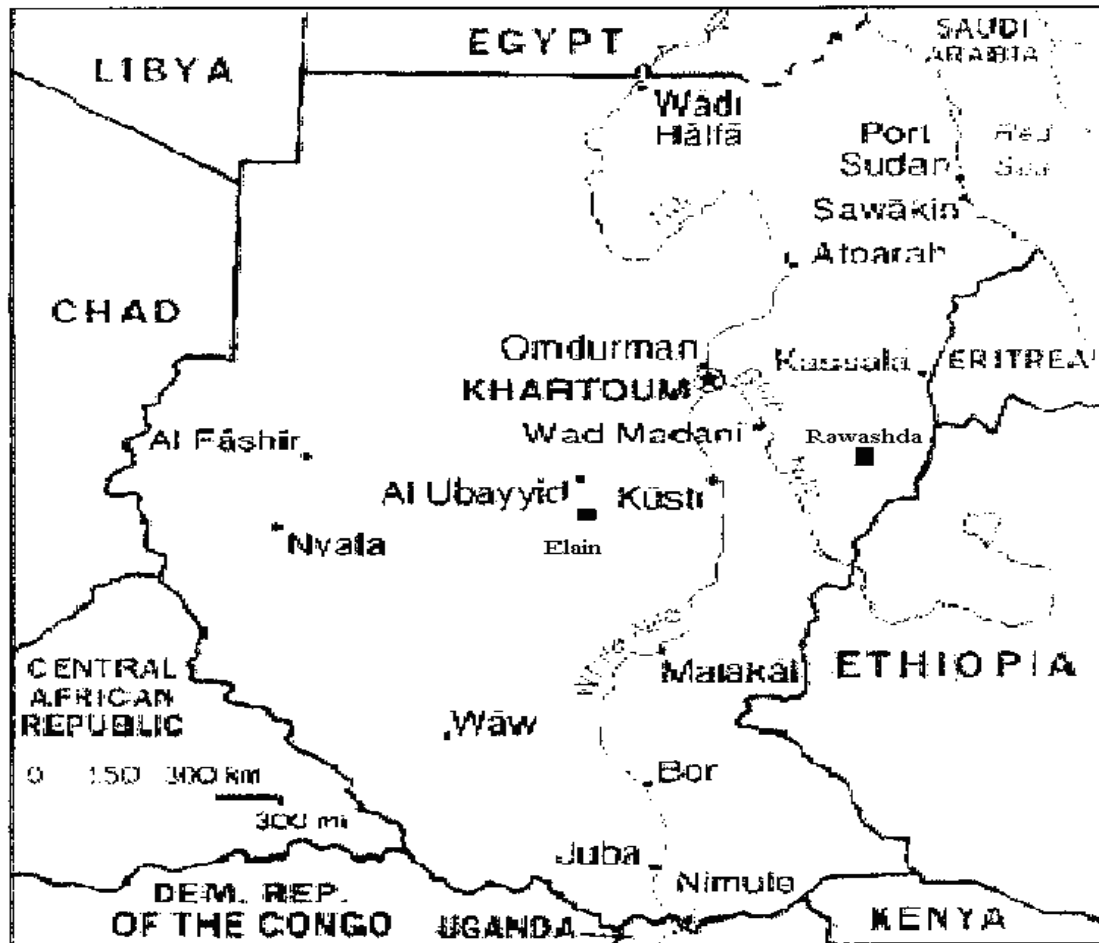
Interviews with local community members were made first followed by interviews with the foresters and forest managers. Finally, the participatory rural appraisal sessions were held to clarify all the points and remove inconsistencies. Semi structured interviews were held with local people using flexible checklists in order to give them more freedom to express their opinion and to pursue topics of interests. The idea was to initiate the social participation, to collect aggregate data at the village level and to understand the community and its survival strategies in all the study area. The sheik (village leader) was first consulted to take permission and he was asked to invite all people involved and not involved in forest management for a meeting on an affixed date. The objective of this method is to verify the collected data from local community and to check the accuracy and validity of the answers. It also offers the chance to check incomplete or uncertain information collected from local people. Moreover, some closed ended questions administered to local people were limited to the choices provided by the investigator; this PRA offered a chance to having depth, richness of description and spontaneity of expression and attempt to establish relationships among variables.

Based on their participation respondents were divided into two main categories: those who are involved in forest management and those who are not but are living in villages where collaboration took place and the questionnaire was administered for both groups. Respondents were categorised according to their economic activities and relation to the forest. A random sample of 10% of each group was selected. The size of each sub sample was proportionate to the size of each sub group. The total sample size is 106 respondents.

All selected villages were involved in forest reserves management. In the Elgedaref area all the villages participating in forest management, they are the target of FAO/FNC, and ADES/FNC projects, were selected. All the selected villages are located in Elgedaref North Rural Council. In Elain area the fieldwork took place in five villages. The selected villages are covered by the (SOS/FNC) project activities. Four of which from the settled farming community, and the other one is a group of transhumant pastoralists. The four villages were selected randomly from thirty villages with which the (SOS/FNC) programme has worked. These villages were selected in a stratified way to ensure the representation of (major soil types, both newly established and pre-existing forest and villages with a range of project

activities). The fifth village was the transhumant pastoralist. The ability of the investigator to include more villages in the sample visit was limited by the time and budget and this careful selection was done to minimize the cost of travel and time.

Figure 1: Areas of Collaborative Management in Sudan



Data Analysis

In this research data obtained were processed and analyzed on a person computer using the statistical package for social science (SPSS) software. Descriptive statistics is a useful analytical tool allows the researcher to examine the characteristics, behaviours, and experiences of study participants (Pilot & Hungler 1999). In this research, calculation of the percentages was used as a tool of analysis for interpreting the qualitative information collected from the respondents. Chi-square test was also used as an analytical tool in this study. This statistical technique was used to compare the frequencies of different selected variables in this research.

Results and Discussion

Throughout history, conservation of nature reserves has implied free natural succession and limited disturbance by humans. Nowadays this policy is often questioned and many argue that human interaction in sensitive nature also can be positive in terms of improved natural resource management, and maintenance of biodiversity. There is a new global trend in natural resources management promoting local control and management of forests and natural areas that surround communities where people live and work. This is partly a reaction against large-scale production, which has not taken local concerns for the land and natural resource management into consideration. In many cases consumers of ethically and environmentally friendly products can see these interests in local control as a reaction to the new demands. Advocates of local management models propose that the realization that all natural areas are unique, and consequently these areas required specifically adapted management models. This notion is spreading throughout the world. Some example of this include: India, where approximately 1.5 million hectares of forest are jointly managed by local communities; Nepal where there are over 6000 forest user groups managing 500,000 hectares of forest land; and Scotland, where the government has expressed its support for local management, and local communities have begun to care for the state owned forest.

Resource Protection and Its Rules

In the villages where collaboration took place, respondents have local knowledge and means of forest protection and the woodland is usually well protected. Local people, and even those who are not involved in the forest reserve management but live in the participating villages, tend to have advance understanding and higher awareness to the way of managing and protecting the reserved forest. Percentages of respondents who indicated the presence of restrictions on types and/or parts of trees, which may be harvested, and resource protection are 96.4% for participatory respondents and 90% for those who are not involved in reserve forest management (Table 1). The percentages of those who indicated the presence of local and official rules on tree planting are 98.2% and 88 % for both categories of the respondents respectively (Table 2). Chi square test (Table 1 and 2) indicated that there is no significant difference between the two categories of respondents in the study area ($P= 1.83$ and 0.095) respectively. This clearly explains the effect of participation in changing respondents' awareness and attitudes towards the resource surrounding them.

Table 1. Respondents' Answers with Respect to Presence of Restrictions on Type of Trees and/or Parts which may be Harvested

Respondents type	No.	Restriction on the type and/or parts of trees which may be harvested and resource protection			
		Yes		No	
		f	%	f	%
Respondent involved in forest resaved management	56	54	96.4	2	3.6
Respondent not involved in forest resaved management	50	45	90	5	10
Total	106	99	93.4	7	6.6

Chi=1.77, (P=1.83), (f = frequency). Source: field survey data, 2007

Table 2. Respondents' Answers with Respect to Presence of Rules on Trees that may be Planted in Various Lands

Respondents type	No.	Rules on trees which may be planted in various lands					
		Yes		No		Do not Know	
		f	%	f	%	f	%
Respondent involved in forest resaved management	56	55	98.2	1	1.8	0	0
Respondent not involved in forest resaved management	50	44	88	4	8	2	4
Total	106	99	93.4	5	4.7	2	1.9

Chi=4.698, (P=0.095). Source: Field survey data, 2007.

The rules under which woodlands are protected vary greatly and are a function of local, physical, economic and institutional factors. More than half of the respondents (58%) stated that rules are set and governed by the Forest National Corporation while 35% of them stated that rules are set and governed by Forest National Corporation, community leaders and forest committees and only 7% stated that there are no rules. Together with the

national rules applied by the forest services, applications of local rules tend to be flexible with the community leaders exercising a considerable amount of discretion. According to the respondents certain important tree species, for example are protected against being cut by non-villagers, and villagers are only allowed to cut them with permission from the local leaders and forest committees. Fruit trees also tend to be protected against any form of cutting and against collection of fruits before they are ripe. Wholesale clearance for agriculture or felling of trees for charcoal-making is rarely permitted. According to the respondents some rules may be mitigated for certain species by exceptions, for example the rule “do not cut a tree” may be mitigated under an exceptional license provided by the leadership or forest committee for the cutting of minor branches only or in cases of extreme poverty. It is common that a range of exceptions and ambiguities might therefore exist but some rules are national and cutting of certain tree might be completely forbidden. Respondents, especially in Elain, argued that guards are employed by the local community to protect the community-reserved forests and their salaries are paid from fines or from community revenues derived from sales of forest produce. Alternatively there are also community forest committees which have the overall responsibility to protect the reserved forest. The number of people involved in this case is higher than the case of salaried guards, but they tend to visit the forest on less regular basis. The whole community shared responsibility for monitoring forest exploitation and informing village leaders of irregularities.

Generally participation in reserved forest management raises the local community awareness to a higher degree. They are fully aware of the rules, which apply to their forest resources, and this makes local control more efficient than that provided by the state forest services.

Form of the Management System

The form of management in Elrawashda and Elain forest reserves is collaborative management, which seeks to create agreements between local communities or groups of resource users and conservation authorities for negotiated access to natural resources, which are usually under some form of statutory authority.

Since early 1980s international assistance introduced management practices in the natural forest reserves based on project concepts and local people participation with the objective of forest rehabilitation and sustainable management considering people’s needs. Various organizations (FAO followed by ADES) were involved in the rehabilitation of Elrawashda forest reserve. During the rehabilitation process, the villagers would have access to agricultural land, grazing land and water points. The land use practice adopted was known as “village tungia” which is an agroforestry system

involving crops and tree seeds cultivation on the same piece of land. This process was based on mutual benefits between the local community and FAO/ FNC project. ADES/FNC project developed a collaborative system with the local villagers based on a contract between the two partners, for the use of the forestland property. Each individual farmer is granted a piece of land inside the forest such that 75% of it is used for crop cultivation and on the 25% the farmer raises forest crop and is obliged to protect the new generation.

The SOS/FNC project in Elain natural forest reserve is a forest conservation management system based on local community involvement. The management system adopted a system of organizing people in the management process in order to prevent destructive illegal felling and at the same time to satisfy people needs from the forest products. The village forest society, local institutions are among the most efficient local institutions that collaborate with FNC/SOS in peoples' mobilization.

Management Responsibilities

Respondents in the study area have clear opinion about who took the responsibility of the rehabilitation, conservation and management of these reserves. Table (3) shows that only 25% of the respondents mentioned that FNC is responsible for forest conservation and management at Elrawashda forest reserve. However, 67.8% of the respondents stated that FNC, non-governmental organizations, farmers and other institutions shared the responsibility for managing the forest. On the other hand all interviewed respondents at Elain know the FNC, non-governmental organizations local leaders and forest committee as being responsible for forest conservation and management (Table 3). These results indicate the higher awareness of the local people in the study area of the parties involved in the management responsibility. Moreover, it indicates that collaboration provides a shift in responsibility and management from FNC to people, from central and local government to local community. However it does not mean a shift towards open access but, rather a shift towards a much more organized common property.

Table 3. Respondents' Answers with Respect to Management Responsibility

Area	No.	%Target Group					
		FNC		FNC, NGOS, forest committee and the community leaders		FNC, NGOS, local farmers, and other institutions	
		f	%	f	%	f	%
Elain	28	0	0	28	100	2	7.1

Elrawashda	28	7	25	0	0	19	67.8
Total	56	7	12.5	25	50	21	37.5

Source: Field survey data, 2007

Forest Products

Natural forests provide various products and other benefits to local people in the study area. Products include timber and non-wood products.

(1) Source of Forest Products

People around Elain and Elrawashda collect their needs from wood and non-wood products from different sources including the natural forest reserves. Table 4 shows that 32.9 % of the respondents in Elain collect their wood and non-wood products from the community reserved forests, 30% collect forest products from the reserve forest, 25% from buffer zones around Elain and the rest 12.4% collect their needs from forest products from trees on cultivated land. However, in Elrawashda 44.1% of the respondents collect the wood and non-wood products they need from the natural reserve. Other sources in Elrawashda include market (27.3% of respondents) and cultivated trees (12.4% of respondents). This distribution of the sources of forest products collection reduces the pressure on the government natural reserves. Establishing the buffer zones around forests to deflect the forest use and to promote alternative sources of collection help a lot to conserve the natural forest reserve and secure, for a period at least, the passive co-operation of a forest-local community, and even their involvement in some practical management duties.

Table 4. Source of Forest Products

Source Kind of product	Buffer Zone		Cultivated Lands		Communi- nity Forest		Reserved Forest		Market	
	% of the Respondents.									
	EL	E	EL	E	EL	E	EL	E	EL	E
Fuel wood	5	3	34.5	76.5	50.9	3.9	1.8	0	25.5	19.6
Building poles	23.6	41.2	35.5	45.1	50.9	0	0	2	5.5	5.9
Wood for furniture	70.9	82.4	4.5	7.8	7.3	3.9	0	2	3.6	2
Fences	1.8	2	3.6	45.1	21.8	2	3.6	0	74.5	45.1
Fruits	18.2	17.6	49.1	76.5	36.4	3.9	0	0	16.4	2
Medicinal products	3.6	39.2	50.9	58.8	34.5	3.9	0	0	29.1	0
Fodder	1.8	5.9	3.6	39.3	29.1	0	81.8	62.7	20	5.9
Average	17.8	27.3	30.4	44.1	32.9	2.5	12.4	9.5	25	11.5

EL= Elrawashda, E=Elain. Source: Field survey data, 2007

(2) Accessibility to the Forest Reserves

Accessibility and permission of entry to Elain and Elrawashda forest reserves is efficiently organized in collaboration between local people with local leaders, village forest committees and FNC. Research findings (Table 5) show that local people around Elain and Elrawashda obtained the forest products from the reserved forests using various mechanisms. The majority of the participating respondents in the forest reserve management (92%) indicate that their needs are legally provided by the management system; and thus only 3.6% of the respondents obtained their forest products illegally. On the other hand, it is found that 36% of the non-participated respondents get their needs on a commercial basis, while 34% get it through permission and 30% obtain their needs illegally.

Results presented in Table 5 show the significant difference between the two respondents categories in the way through which they obtained their needs. These results indicate that local people who participated in forest management perceive the role of forest management under the control of forest managers and that local people are aware of all legal contracts, which clarify how to obtain the needs. Moreover, collaborative management organizes local people entry and accessibility to their needs.

Table 5. Accessibility to the Forest Reserve

Respondents type	No.	How needs obtained							
		Legally provided by the management system		Illegally obtained		On commercial basis		Through a permission	
		f	%	f	%	f	%	f	%
Respondents involved in forest management	56	52	92.9	2	3.6	2	3.6	0	0
Respondents not involved in forest management	50	0	0	15	30	18	36	17	34
Total	106	52	49.1	17	16	20	18.9	17	16

Chi=91.69, (P=0.001). Source: field survey data, 2007.

With respect to the protective measures and people contributions to rehabilitation approaches, 78.8% of the participation respondents and 58% of the non-participation respondents stated that the forests condition is now better. Chi square test (Table 6) indicates no significant difference between the

two respondents' view in that the situation of the reserves is now better. This result indicates a considerable change in the non-participating villagers' attitude towards collaborative management and also shows how local people perceive the ecological impact of the management system.

Table 6. Respondents' Answers with Respect to Forest Situation

Respondents type	No.	Situation of the forest reserve with respect to protection measures					
		Better		Worse		No change	
		f	%	f	%	f	%
Respondents involved in forest management	56	44	78.6	7	12.5	5	8.9
Respondents not involved in forest management	50	29	58	13	26	8	16
Total	106	73	68.9	20	18.8	13	12.3

Chi=5.252, (P=0.07). Source: Field survey data, 2007

Results presented in Table 7 show that all the participating respondents interviewed in Elain (100 %) believe that collaboration promoted the management of the forest resource, i.e. use of forest resource in a sustainable way and succeeded in satisfying local needs. On the other hand 50% of the participating respondents in Elrawashda do not appreciate the management system approach in satisfying basic needs because there is no declaration in the individual contract for the distribution of the benefits from forest products and still people are prohibiting from getting what they want (Table 8).

Table 7. The Success of the Management System to Satisfy Local Needs

Area	No.	Success of the management system to satisfy the needs			
		Yes		No	
		f	%	f	%
Elain	28	28	100	0	0
ELRawashda	28	14	50	14	50
Total	56	42	75	14	25

Source: Field survey data, 2007

Table 8. Reported Reasons for the System not Successful in Satisfying the Local Needs in Elrawashda

Reported reasons	% of the respondents	
	f	%
No declaration in the contract	2	14.3
No declaration in the contract and general prevention policy	12	85.7
Total	14	100

Source: Field survey data, 2007

According to the forest manager of Elgedaref, early afforestation carried out by the forest department to restore the forest resource and to provide the needs for the local people was based on mutual benefits between local people and FNC. The programme was handicapped by financial stresses and it also had some technical complications. In the signed contract between the tungia farmers and the forest department the farmers are allowed to cultivate a specified open area in the reserved forest for a period of two years with agricultural crops (sorghum). In the third year, the farmer has to plant the sorghum and hashab (*Acacia senegal*) seeds and leave the land after harvesting his agricultural crop. Later on, the number of the participating farmers increased beyond control, as land became scarce and the prices of sorghum increased substantially. Farmers became reluctant to follow their contracts. Farmers developed various tactics such as boiling the seeds prior to sowing and weeding out hashab seedlings together with weeds in order to continue using the land. Consequently large areas in the reserved forest became in reality-mechanized farms.

In 1982, the government decided to abolish the use of the tungia in reserved areas. Many foresters believe that the problem was more in the selection of the farmers than in the tungia system itself. Farmers who participated were large absentee mechanized farmers and not a small farmers from local villages who had an interest in preserving their immediate forest resources. Later ADES/FNC developed collaborative system with the farmers. Elsidig et al. (2001) reported this collaborative system based on a contract between the two partners for the use of the forest land property and the contract clearly stated the share of the agricultural grains. Access to non-wood forest products is secured as a right of use, but the negotiations between the people and FNC is in progress concerning the future of the natural reserve management and share distribution with regards to forest products.

From this presentation it could be concluded that unless the current land use system is changed for a better one; food production would no longer be

possible. The system envisaged is to accommodate various practices to supply the needs of the local people with respect to fuelwood, grazing, farming and other uses. The system should take into account that people should have a clear right to the plots of land under their use and also to the trees that they might plant. Even these still participating and non-participating respondents 94%, 70 % respectively agreed that the management system succeeded to sustain the forest resource in a way that it became better able to survive and has a good performance record. Despite these high proportions of the two respondents groups concerning the success of the system, the percentage of the non-participating respondents who agree that the management system succeeded in sustaining the resource is significantly lower than that of the participating respondents ($P= 0.001$, $\text{Chi}=11.37$) (Table 9). This clearly explains the effect of the local people's involvement in the management in enhancing their awareness of the ecological impact.

Table 9. The success of the Management System in Sustaining the Resource

Area	No.	Success of the management system in sustaining the resource			
		Yes		No	
		f	%	f	%
Respondents involved in forest management	56	53	94.6	3	5.4
Respondents not involved in forest management	50	35	70	15	30
Total	106	88	83.0	18	17

Source: Field survey data, 2007

Extension Services and Training

According to Chamber (1987) the main objective of the extension is to promote and encourage local people's participation in forestry activities and programmes to ensure sustainable resource management and to bring social change in the behavior of the community. Results of study Show that 82.1% of the participated respondents in the study area received extension services from forestry extensionists. Among the participating respondents 46.4% received training in different forestry activities. The type of training received is provided in Table 11. According to forestry staffs the conducted training enhances local people knowledge and skills and they were able to implement the different forestry activities properly.

From the result presented in Table 10 it is also clear that collaboration started with strong extension services from FNC and other donor agencies in collaboration with local people who share the control of the activities and this was a very important step for the success of any programme because extension help a lot to raise local people's awareness as how to manage the forest in a sustainable way. The subjects tackled by extensionists are summarized in the same table. It is clear that great emphasis is given to tree planting for rehabilitation and conservation and to forest protection and this reflected in the good forest performance as mentioned in the earlier discussion.

Table 10. Extension Services Provided by the Management System

Subject Talked by Extensionist	% of the Respondents
Planting trees	67.9
Protect forest	57.1
Regulate yield	26.8

Source: Field survey data, 2007

Table 11. Training Provided by the Management System

Type of Training Received	% of the Respondents
Nursery techniques	41.1
Wood stove making	16.1
Planting on micro-catchments	28.6

Source: Field survey data, 2007

Wiersum (1991) reported that, traditionally, the assumption was that forest protection and management should be based on central policy and planning with an authoritative and hierarchal forest service. Presently, those assumptions are reappraised and a need is identified to complement the strategy of forestry development based on national interests and industrial growth with new strategies focusing on basic needs, equity and popular participation. Consequently, forestry authorities modify their conventional management strategy and give room to local people to participate, leading to complete change in the former policing approach of managing forest resources. However, local people could not be approached without winning their trust and extension is the way to create trust between local people and the outsiders. Regular interaction with forest extensionist helps local people to develop positive attitudes towards forests and their conservation. Extension in forestry needs to be encouraged as it facilitates coping with the stresses

arising from new changes. More emphasis should be given to extension because it is the tool for sustainable development.

Participation

The management system succeeded in unifying the village peoples, ironing out their differences and making them behave as a group to preserve their common interest. Likewise, the system succeeded in improving capabilities and raising local people's awareness by the different activities they participated in. This best illustrated by Table 12, which shows the higher degree of participation in forestry activities adopted by the management system in the study areas. In Elrawashda, all the interviewed respondents (100%) participated in tree planting in agroforestry system, but at Elain area community forestry and related activities took place and with regards to this 96.4% of the respondents participated in community forestry activities. About 82.1% of the interviewed respondents participated in planting in micro-catchment, while 60.1% participated in establishing live fencing of *gubraka* plots (vegetable gardens) and 32.1% participated in woodstove making and *haffir* (water reservoir) construction.

Table 12. Forestry and Different related Activities that Respondents Participated in

Area	No	Activity											
		C.F		Agro-forestry.		W.S.M		Planting in M.Cs		<i>Gubraka</i>		<i>Haffir</i> constr.	
		f	%	f	%	f	%	f	%	f	%	f	%
Elain	28	27	96.4	0	0	9	32.1	23	82.1	17	60.7	9	32.1
Elrawashda	28	0	0	28	100	0	0	0	0	0	0	0	0
Total	56	27	48.2	28	50	9	16	23	41	17	30.3	9	16

Source: Field survey data, 2007

C.F= Community forests, W.S.M = Wood stove making, M.Cs =Micro-catchment.

It is instructive to understand that the establishment of community forestry was the target of the collaborative system in the Elain area, and this indicates that emphasis has shifted away from management of the reserve towards promotion and support of local villagers in their quest for securing rights to own and manage their own forest resources. Moreover, the extension activities such as plant on micro-catchment, village nurseries, woodstove making and *gubraka* live fencing can be seen as facilitative of community forest.

In an attempt to assess the relative importance of these activities in Elain PRA exercise carried out in the fieldwork with men, women and male leaders. Five people per each subgroup were asked to rank from 1-5 the activities that had taken place in their villages in order of preference. Table 13 therefore represents the aggregated scoring of more than 50 villagers. The ranking exercise was then used to solicit on the absolute and relative usefulness of each activity. All perceived *Haffir* as the most important. The village forests and micro-catchments come next, though interestingly the women rank them fourth and last respectively. This and the preference for live fencing of *gubraka* plots and stoves; on one level clearly reflect the fact that these activities were targeted to meet women interests. A forest senior staff stated that micro-catchments have made an important contribution to the local environment by; increasing grass, tree cover as well as fruits production. He added that digging was done manually to consolidate the idea of participation and this water harvesting techniques suits the area and helps eliminate disadvantages of gardod (sandy) soils. From this it could be concluded that collaboration is more accepted by local people and succeeded to empower them to take control of and sustainably manage natural resources.

Table 13. Ranking Relative Importance of Different Forestry Activities in Four Villages in Elain

	<i>Haffir</i>	Village forests	Micro-Catchments	Improved woodstove	Nursery techniques	Support to <i>gubraka</i>
Women	1	4	6	3	5	2
Men	1	2	3	6	4	5
Leaders	1	2	3	4	5	6

Source: Field survey data, 2007

Management Plans

With regards to management plans, all the interviewed respondents (100%) in Elrawashda stated that no management plans exist. Group discussion with participating and non-participating respondents show that the management system is still limited to individual farmers and is not including the whole community. As mentioned earlier the system in Elrawashda was faced by many technical and financial stresses at the beginning of its adoption that hinder its spread to cover the whole community and to empower them through many other forestry activities. The management performance needs to be improved to generate local people confidence and participation. But in Elain all the respondents (100%) are aware of the existence of the management plan and they explain that the

management plan was prepared in consultation and involvement of local people. Moreover, they expressed a high level of confidence and commitment to the management plans when they were asked to mention different elements of the management plans (Table 14).

Table 14. Existence of the Management Plans

A.	No	Existence of the management plan				Reported elements of the management plan by the respondents									
		Exist		Not exist		F.P		B. up		Y.R		O.F.		Th.	
		f	%	f	%	f	%	f	%	f	%	f	%	f	%
E	28	28	100	0	0	24	85	24	85	5	17.8	7	25	4	14.2
E.L	28	0	0	28	100	0	0	0	0	0	0	0	0	0	0
T.	56	28	100	28	100	24	100	24	100	5	100	7	100	4	100

A. =Area, E. =Elain, E.L. =Elrawshda, F.P =Forest protection, B= Beating, YR=Yield regulation, O.F= Open fire lines, Th. =Thinning, T. = Total. *Source:* Field survey data, 2007,

When it came to more detailed information, such as ability to describe what a forest inventory was, the knowledge level reached 50%. This aspect indicates that people basic awareness of the management plans appears to be high. In Elain the natural forest management project (NFMP) has played facilitative role in assisting villages to register community forests and then establish management plans. It has helped them to develop individually tailored plans that govern the management of each community forest. Today, in Sudan, communities themselves have developed clearly codified rules and regulations governing how they will manage a forest resource. Hence collaboration brings the local people back to the traditional management.

According to Billal et al. (2001) the management plans are very innovative and are founded on ideas from the people involved but they are a very recent initiatives nurtured by NFMP. They are effectively in a pilot phase, the finalized version only just having been drawn up. It therefore remains to be seen how far the plans will be adhered to and how will be the capacity of the community to manage them. A senior forest officer reported that the major concern for them is that the management plans are written and therefore inaccessible to the majority of the community within which few people are literate. They believe this will affect the quantity and the quality of the record keeping. (Kherof 2000) on the other hand has confidence in the capacity of the communities to manage their own woodlands, but is critical of some of the impositions made by the outsiders. Kherof argues that people do not maintain the firebreaks, which are mandatory for registration since they have their own mechanisms for controlling fires. He is also against “scientific” harvesting quotas arguing that local institutions should be allowed to act as their own discretion. He also cites an example of a lack of confidence in local

management on the part of the FNC. He relates the case of El Jefil where in 1999 the FNC representative argued that the forest had degraded since it had been in the villagers' control. The villagers argued to the contrary that the forest was in better condition. At the time, without any records, neither was able to substantiate their point of view (Kerof 2000). Mukhtar (1990), Abdullah & Holding (1988) both reported that local people in Sudan are knowledgeable and used to managing their forest resources in their surroundings. After the drought of 1984/85, the forestry authorities realized that without local people and other actors' participation, they would not be able to reforest and manage sufficient land to provide the needs of the people for forest products and services.

Impact of the Management System

In this section the different impacts of the management system on the respondents' socio-economic life and the rules governing resource management will be discussed.

(1) The role of the Management System in Changing Traditional Rules Governing Natural Resource Management

The Forest Act (1989) granted certain rights and privileges to local communities living in or around the reserved forest. Table 15 shows that 96.4% of the respondents in Elain and 32.1% in Elrawashda argue that, the system succeeded in changing traditional rules governing resource management, while none of the respondents in Elain and 53.5 % in Elrawashda stated that it has not succeeded in changing traditional rules. The chi square test indicates that the difference in the respondents' opinions in the two areas regarding the impact of the management system on the traditional rules governing natural resources management is significant ($\chi^2=26.006$, $P=0.001$). Respondent in Elrawashda who reported that the management system failed to change the traditional rules governing the natural resources management mentioned the reason, namely that it does not help the people to register forests to be owned and managed by the community. This result indicates the interest of the local people in Elrawashda area in community owned and managed forests.

The general manager of Elgedaref recorded that the main target of the system is to rehabilitate the forest based on local people support. He added that the local people in Elrawashda area are still not very well aware about the forest act that grant certain rights to local people to own community forests. He thinks that this is the reason why they see the collaborative system is focusing on individuals and not on all people. He also added that The FNC still suffers from technical and financial stresses and the extension unit lacks the financial support to facilitate its role in raising local people awareness.

In Elrawashda, 33.3% of respondents stated that the system succeeded to change traditional rules because it lets all reserved lands including the reserved forest being publicly used by the community for their benefit and reserved some excess village lands owned by others for the benefit of the whole community (Table 16). On the other hand, in Elain, respondents who agree the system change the traditional rules see this in a way that it registered some forest lands to be owned and managed by the local people and this is reported by 100% of the interviewed respondents (Table 16). This result indicates that there is a shift from management of the natural forest reserve to community owned and managed forests. (Billal et al 2001) explains that the Forest Act (1989) provides considerable impetus for the National Forest Management Plan (NFMP) in Elain. However, as the provision of the law has been acted upon and tested, it has become apparent that there are considerable problems constraining the potential of the forestry Act being effectively implemented in the interests of grass roots groups. The NFMP attempts to address these deficiencies, and the result was a series of recommendations. The recommendations include effective decentralization of powers to the state for land tenure reform and for legislations favouring community-based organizations (CBOs) as well as specific and detailed recommendations on registration processes legally recognized by laws and by the authority of village committees responsible for managing the community forests. From this, it is clear that the safeguarding of community rights is clearly a major achievement by the collaborative system, especially in the context of Sudan where tenure is monopolized by the state. Once gazetted, the village committees in charge have effective authority for supervision and policing of their forests. They are in a position to enforce the internal rules adopted for the management and control of the forests.

Table 15. Respondents' Answers with Respect to the Success of the Management in Changing Traditional Rules

Area	No.	% of the Respondents					
		Succeeded		Not succeeded		Do not know	
		F	%	F	%	F	%
ElRawashda	28	9	32.1	15	53.5	4	14.2
Elain	28	27	96.4	0	0	1	3.5
Total	56	36	64.2	15	26.7	5	8.9

Chi=26.006, (P=0.001). Source: Field survey data, 2007

Table 16. Reported Reasons for the System Success

Area	No	Reported reasons for system success					
		Registered forest lands for the villages		Reserved some excess village lands		Reserve some excess village lands and let the reserved land publicly used by the community	
		f	%	f	%	f	%
ElRawashda	9	0	0	6	66.6	3	33.3
Elain	27	27	100	0	0	0	0
Total	36	27	75	6	17	3	8

Source: Field survey data, 2007

(2) Social Effect of the Management System

It appears that all respondents in the participating villages whether those involved in forest reserve management or those who are not involved perceive the social effect of the management system. Table 17 shows that 66.1% of the participated respondents perceived the social impact of the management system; they believe that the management has a positive social effect in that it strengthens the relationship with different institutes, raises people's awareness and changes their attitudes towards the forest management, and reduces migration.

This finding reveals that the different activities carried by the management system enhance people's awareness about its social impact. On the other hand, 38% of the non-participating respondents have the same perception. They are the majority of this group and have come to perceive the rationale of the management system. The relationship between respondents' type and respondents' perceptions is significant ($P= 0.01$). This result shows that respondents who are not involved have attitudinal effect in perceiving the social impact of the management system. Only 10.7% and 12.0 % of the two respondents' categories, respectively see that the system has no social effect.

Table 17. Respondents Answers with Regards to the Social Effect of the Management System

Respon- dents type	No.	Social effect									
		Strengthen relationship		Awareness raising		Reduced migration		All		No effect	
		f	%	f	%	f	%	f	%	f	%
Involved	56	8	14.3	2	3.6	3	5.4	37	66.1	6	10.7

Not involved	50	7	14	11	22	7	14	19	38	6	12
Total	106	15	14.2	13	12.3	10	9.4	56	52.8	12	11.3

Chi=13.38, (P=0.01). Source: Field survey data, 2007

The group discussion with participants and non-participant in the study areas shows that the relations between the villagers and other institutions (FNC, rural councils) are strengthened. Reduced migration is, in fact, appreciated by the local people especially in Elain. According to them *haffir* construction reduced migration and let people remain in a given area, either on a seasonal or a permanent basis. On the other hand, many of them commented that the collaboration system has considerably enhanced awareness about the environment, the implication being that the villagers are now more minded to take care of their natural resources. (Kherof 2000) represents another thought which, argues that people who live on the land are very much in tune with their environment and that it only requires the legal and institutional framework to be adjusted in their favour so that they take responsibility for the resources, on which they rely to secure their livelihood. Collaboration has used the changes in the law brought about by the 1989 Forest Act to facilitate people in their stewardship of natural resources. Such changes are in many contexts hindered by a lack of trust towards farmers and pastoralists on the part of official institutions. A senior forest officer at Elain stated that foresters schooled in a policing mentality which attempted to keep people out of the forests are now amongst the strongest advocates for giving people responsibility for managing forest resources. The director of FNC and the head of Sudanese social forestry network appreciate its effect on local people and local institutions in making them aware about the management approach, what it is attempting to do, and have in different ways for advocating community forests. Hence, the system is responsible for promoting attitudinal changes within a range of important institutions.

(3) Economic Effect of the Management System

In the participating villages increase in income represents the major outcome of the economic effect of the system. More than 75% and 64.3% of the non-participating and participating respondents respectively report this. The relation between the perceptions of the two respondents' categories is highly significant (P= 0.001), (Table 18). This is meaningful and understandable since there are many income-generating activities operated under a collaborative system, such as sales of agricultural products, wood stoves, fruits, vegetables and grasses.

The economic effect is also reported by 23.2% of the participating respondents and they represent 92.9% who see its effect in both increase in

income and reduction in charcoal consumption due to the use of wood stoves. The economic benefits are perhaps significant in terms of the savings that the system offered to the people both in the area of income generation but more significantly for items that are not normally obtained from the market.

From the group discussion in Elain it was clear that reduced outlay of money and, in particular, time, has resulted from *haffirs* with water now being available for human and animals consumption as well as for clay bricks construction. Community forests provide some current resources, particularly dead wood and grasses.

Generally collaboration is a very important experiment in promoting local management of woodland resources and it goes long away to show that local people can be empowered to take control and sustainably manage natural resource based on basic needs.

Table 18. Respondents' Answers with regards to the Economic Effect of the Management System

Respondents type	No.	Reported economic effect							
		Increase income		Wood stoves reduced charcoal consumption		Both		No effect	
		f	%	f	%	f	%	f	%
Involved	56	34	60.7	7	12.5	13	23.2	2	3.6
Not involved	50	40	80	1	2	1	2	8	16
Total	106	74	69.8	8	7.5	14	13.2	10	9.4

Chi=18.59, (P=0.001), Source: field survey data, 2007

The Forest Resource Assessment

Forest resources assessment is based on previous studies related to the study area and local people knowledge. Generally, the existing forest cover (whether inside or outside the forest reserves) is facing very high pressures and continuous depletion on legal or illegal bases. Elsidig & Yassin (1998) stated that until the mid-sixties our forest capital stock was maintained at steady level of around 2.2 billion cubic meter. From mid-sixties onwards a decline of the forest growing stock continued at increasing rate as a result of land use changes and mismanagement.

According to the study conducted by Mohamed (2000), the conservative management system practiced in Elain natural forest reserve as joint activities between FNC, SOS in collaboration with local people induced stand development in stocking density when compared to Habile forest where

Formal management practices is represented in guarding and patrolling work executed by a few forest guards. From the inventory conducted during 1996-1999 to measure tree numbers, results showed that the general trend is an increase in number of trees over time, as shown in (Table 19). The total number of stems per hectare increases from 381 trees/ha in 1996 to 1020 trees/ha in 1998 in Elain forest reserve compare to Habile (102 tree/ha) (Table 20).

Table 19. Number and Density of Associated Tree Species in Elain forest

Species	1996		1997		1998		1999	
	No./ha	%	No./ha	%	No./ha	%	No./ha	%
<i>A.mellifera</i>	360	43.32	378	39.75	399	39.12	391	48.55
<i>Cadaba</i>	123	14.80	151	15.88	141	13.82	144	17.14
<i>Bosica</i>	165	19.86	233	24.50	279	27.35	150	17.86
<i>Cordia</i>	14	1.68	14	1.47	32	3.14	11	1.31
<i>Grewia</i>	145	17.45	141	14.83	148	14.51	131	15.60
<i>Combretum</i>	3	0.36	10	1.05	7	0.69	1	0.12
<i>A.nubica</i>	21	2.53	24	2.52	14	1.37	12	1.43
Total	381	100	951	100	1020	100	840	100

Source: Mohamed (2000)

Table 20. Number of Trees and Stocking Density by Species in Elain and Habile Forest Reserves

Species	Elain		Habile	
	No./ha	%	No./ha	%
<i>A.mellifera</i>	184	22.89	44	43.14
<i>Bosica</i>	175	21.76	2	1.96
<i>Cadaba</i>	159	19.77	24	23.53
<i>Grewia tenax</i>	40	4.97	7	6.86
<i>A.nubica</i>	42	5.22	3	2.94
<i>Cordia</i>	56	6.96	1	0.98
<i>Indgofera</i>	24	2.99	1	0.98
<i>Adansinia</i>	8	1	1	0.98
<i>A.nilotica</i>	16	2	-	-
<i>Terminilia</i>	56	6.96	-	-
<i>Permna</i>	24	2.99	-	-
<i>Grewia villosa</i>	20	2.49	-	-

<i>Dalbergia</i>	-	-	1	0.98
<i>Balanities</i>	-	-	2	1.96
<i>Ziziphus</i>	-	-	3	2.94
<i>Combretum</i>	-	-	1	0.98
<i>Bauhinia</i>	-	-	11	10.78
<i>A.seyal</i>	-	-	1	0.98
Total	804	100	102	100

Source: Mohamed (2000)

The contribution of the people in water harvesting management resulted in improved survival rates of regenerated indigenous species. Billal (2000) reported that tree seedlings performance in micro-catchments at Elain forest reserve has been assessed. A number of trees were recorded more than 80% survival after six years of observations: *Ziziphus spina-christi*, 84% *Growia lonax*, 83% and *Acacia tortilis* 82.3%. *Acacia mellifera* the predominant species in the reserve and community forestry had only been under observation for three years. Its survival rate at 98.7% however was stronger than any of the above-mentioned species at the corresponding period, *Acacia tortilis* being the next best performer at 90% survival after three years. Such figures are to be contrasted with surveys on the village lands, which showed much reduced survival rates ranging from between 23.7% to 62%.

For Elrawashda forest reserve, Osman (2000) reported that the artificial regeneration inside the forest reserve based on participatory approach succeeded in positive stocking densities due to protection provided by the local people. Table 21 shows the area of the plantation, which has been established over the period 1994-1998 that indicates a regular sequence of age graduation from age one to five years, consisting of five even-aged stands. Although the area planted annually shows irregularity; ranging between 700-1346 *feddans*,² yet it indicates continuity of annual planting. The area planted over the five years period amounted to 4746 *feddans* with annual average of about 950 *feddans*. Continuity of reforestation expected to cover all the bare lands in the forest during the next few years.

From the above presentation it is clear that collaboration management provide a steady and stable resource performance; this is indicated by both participated and non participated respondents in that the situation of the two reserves is improving and the management system stabilizes the natural reserves base. Hence they became better able to survive human and environment stress and succeed in sustaining the resource as mentioned in the earlier discussion (Table 6 and 9).

² A feddan = 4200m², 1.038 acre and 0.42 hectare

Table 21. Area-Age Distribution of Forest Crop Established in ElRawashda 1994-1998

Year	Age	Area (fed)
1994	5	1346
1995	4	700
1996	3	960
1997	2	1040
1998	1	700

Source: Osman (2000)

General Remarks

The definition of participating stakeholders roles in collaborative natural resource management ensure implementation of any working framework as it will and who is jointly or independently responsible and for which activity. It also shows what to conduct and when a certain activity is being undertaken. It also indicates who is to be blamed in case an activity is not implemented and who is supposed to sanction and approve an activity. Eventually, this will bring in efficiency and prudent use of resources. However, not all stakeholders are interested in conserving resources or social welfare, nor do they all need to have an equal role in decision-making. In addition, many may only want to participate at particular moments, rather than getting involved in day-to-day management decisions. Therefore, there are significant differences in the dependency, interest, knowledge, motivation and power of stakeholders to be involved in the collaborative management of natural resources. So it is necessary when adopting a participatory process to find out who should participate, what role they should have, how they can be assisted to participate effectively and how the influence over decisions should be distributed.

In practice, although collaborative forest management (CFM) experience has taught many foresters to respects valuable indigenous knowledge systems and organizational mechanism, they nevertheless often remain insufficiently acknowledged in CFM (Sarin 1993; Hobley 1996). Local forest management systems vary considerably in terms of equity, but some may actually benefit local people more than CFM systems that seek to replace them. Common problems arising in CFM management include:

a. Identification of Users and Defining Their Rights:

- Potential exclusion of some stakeholders (particularly those with little influence, but possibly high dependence on the forest). This is clearly noticeable in Elrawashda where farmers who participated were large, absentee mechanized farmers and not small farmers from local villages who had an interest in preserving their immediate forest resources.

- Defining who exactly has rights—e.g. some indigenous peoples argue that adopting a broad stakeholder approach disregards their primary rights.
- b. Equity and Power Relationships:
 - Despite attempts to the contrary (quota systems, etc.), domination of the forest committees and all decisions is still by certain interests groups (political/social elites, men, etc.)
 - The suppression of certain views (particularly when it is officially required that decisions are reached by consensus).
 - Failure to incorporate locally recognized rights and forest management practices. In some cases, these may give greater benefits than the new system.
 - Maintaining transparency and fairness over eventual benefits (particularly regarding commercial timber harvests, and by whom it be controlled)—users often receiving less than the expected benefits.
 - The question of whether benefits should be weighted towards the poor, or whether they should be divided equally amongst all users.
 - Unwillingness on the part of the state to allow the full potential benefits of commercial exploitation to accrue to the forest users (restrictions on transportation of the products, etc).
 - Giving consideration to those who have either no access to or have very poor quality of forest (these concerns are not only limited to the benefits provided by the forest itself, but also the development benefits which may be associated with forestry projects) (Carter 1999).

Communities contain many different interest groups. Shared rights to a resource present the risk of exclusion of certain groups, leading to conflict with those included and conflict between the groups included, if they have different interests. Such conflicts need to be managed through an appropriate institutional structure. This is noticeable more in Elain than in Elrawashda where work around conflict issues had occurred in the lifetime of CFM by project staff and traditional leaders. This resulted in an intervention in the dispute between the people of Gargoor village and transhumant pastoralists based at nearby Sebehat where people from Shinabla tribe reside. The outcome of this work was the drawing up and signing of an agreement between representatives and traditional leadership of the two parties as well as the local authorities over the use of, access and management of the common property resources such as the community forest and the local *haffir*. According to the parties involved and the project team, mutual respect has been maintained with no infringement of agreements to date. This coincides with Arnold (1998); and Bruce (1998) view that in order to regulate the use and management of a common pool forest resource, there must be institutions that authorize and secure use by a particular group of users and institutions

which set rules, to govern use, monitor and enforce these rules. Communal management systems entailed intricate relationships between village groups and local institutions, between individuals and laws that govern the forest, and between government and villagers (Arnold 1998).

Equity is also a distant goal, but at least CFM approaches should not entrench or promote inequitably power structures or become a mechanism of excluding certain interest groups. It is important that all these issues to be considered early in the participatory process to establish who the actors are, what their interests and roles in collaboration are, and how they can be engaged (Ingles *et al.* 1999).

Another important issue for collaborative forest management is the circumstances that influence them and related support programmes, i.e. “the enabling environment” whether social or physical in which they operate. There is a little to be gained by pushing an approach to an environment that is unsuited to it. This means that a support programme should always undertake a stakeholder analysis and check the enabling environment. It should reserve the right to walk away from an impossible set of circumstances in a specific location. Indeed the act of walking away might stimulate stakeholders to rethink their position, or to work through a particular problem in the enabling environment, so that collaboration may have a better chance to succeed in future attempts. This position is justified because often supporters are in the business of encouraging people to take risks and make investments that they might otherwise have avoided in the absence of the support programme. Mistakes by supporters and others during collaboration can be costly both for the rural poor and for the supporter. The rural poor can lose time and resources, and the supporter can lose credibility. Supporters carry this responsibility towards the people whom they are trying to help. This increases the importance of checking on stakeholders and the enabling environment at the start, and of frequently reflecting and evaluating so that problems and mistakes can be anticipated or revealed as early as possible. The government influences a large part of the enabling environment through its policy, laws and development plans and through action of politicians and government agencies.

It appears that collaborative forest management has had a positive impact on forest conditions (Ghai & Vivian 1999). It has been noted that remote sensing is beginning to show an improvement in the quality and area under forests in south-western Bengal; and in Gujarat, Hyena, Madhya, Pradesh and West Bengal. Studies have indicated improvements “in the productivity and diversity of vegetation and increased income’ from non-wood forest products (NWFPs) to members of community institutions” (Sarin 1993). On the other hand, Bruce (1998) has noted that collaborative methods are the most frequently used approaches for conflict management in developing countries.

Hence, more investigations are needed for assessing the impact of collaborative forest management for further development.

Conclusions and Recommendations

Collaborative forest management in Elain and Elrawashda represents a progressive shift towards state recognition of the interdependence between the well being of forests and the well being of local people's dependence on them for subsistence and livelihood needs. The system succeeded in testing the provision of 1989 Forest Act, which allows people or communities to privately control areas of woodlands. It has gone beyond securing rights for local people and helps them to develop management plans. It also succeeded in carrying other related forestry activities, which generate income. It succeeded in benefits sharing arrangements within the community and motivates villagers to participate in forestry conservation and rehabilitation through community-controlled protection.

The case of Elain natural forest reserve management and Elrawashda forest reserve rehabilitation management also provides promising examples for participatory management. These cases gained local people's confidence and was reflected in good forest performance. They collaboratively organized activities inside forest reserves as performed between SOS/FNC and FAO/FNC respectively and the local people facilitate efficient mechanism in the development of natural forest reserves.

Collaborative management of forest resources can be an effective strategy for sustainable forest and rural development. For the strategy to succeed, communities must be partners with forest agencies, other forest users and stakeholders in the management of forest resources. For the partnership to be successful, communities must have security of long-term rights to the forest so that they are assured that they will receive the benefits from the protection and improvement of the forest resources. This link between benefits and sustainable development appears to be a strong one, with improvements due to shared forest management seen "in the quantity, quality, variety and security of forest" (ODA 1996). Collaborative management with its focus on participation supports the empowerment of communities and the inclusion of all groups in the community (minorities, women, etc.) in decision-making. This participatory approach provides the platform for sustainable rural development. And there are constraints that must be addressed, especially the lack of resources for forest agencies to enable them to be effective in their new role. There must also be a willingness to learn the lessons from current activities and try new approaches. For example, communities should be given to manage not degraded but mature forests that can provide substantial income to communities.

There is much interest in collaborative forest management approaches to sustainable forest and land management. To take this concept to other new areas is more a matter of dedication, hard work and serious commitment than simply funding, as the approach is relatively easy to understand. However, there are no two identical rural communities, and working with local communities is not always easy, something which calls for active technical assistance by experienced facilitators to keep this process of change on track.

For participatory forest management to attain long-term sustainability and become a viable long-term option, it is important not to lose the sight of the complexity and diversity of local people's dependency on forests. The challenge is to move beyond community forest protection to develop options for the sustainable satisfaction of essential needs for forest products by local people.

Collaborative forest management in Elrawshda, its emphasis on rehabilitation of the forest on individual contracts needs to be shifted to developing sustainable alternatives for meeting the diverse forest produce needs of the most dependents members of the community. This requires evolving mechanisms for involving all members and meeting the immediate essential needs of them.

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