Company- Community Forestry Partnerships.
Case Study; Kenana Sugar Company

by

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Dedication

To my parents, brothers,

sisters, wife and friends.

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Abstract

In the last two decades, there is a great degradation in the environment of Sudan as a result of deforestation. The inclusion of the institutional forests in forest policy of 1986 was made in order to enhance and encourage all the institutions to adopt the activity. Two institutions managed to establish institutional forests, namely; El-Rahad Irrigated Scheme and Kenana Sugar Corporation (KSC). Even for these institutions there is a relative paucity analyzing company-community partnership. Moreover, there is no lettle information that explores the relationship between the Forests National Corporation (FNC) and the institutions, strategies and methods of application. Kennana Sugar Corporation institutional forests were selected for this study.

The broad objective of this study is to explore the nature of the institutional forest with special emphasis on the strategies and evolution of institutional forests in Sudan, to investigate the degree of success of institutional forest and the possibility of transferring this model to other institutions and assess the main constraints confronting the activity.

Two types of data were used to collect the necessary information, namely; primary and secondary data. The primary data was collected through interviewing, and self-administered questionnaire with the local people and the administrators, respectively.

The main findings of the study were; the adoption of institutional forests was made without specification of the strategies and the objectives of the institutional forests. KS C institutional forest, in the absence of extension unit in the administrative level of the institutional forest, is run by foresters without enough background in forestry extension. Accordingly the administrators rely on top-bottom approach for the assignment of different tasks to appointed committees "Not elected" and delegation of authorities. Neither public meetings nor home visits are made to encourage the participation of local people. Moreover, KSC restrict the introduction of the tree component in the agricultural land. The formation of local institutions and performance of the species is made by the KSC.

The main conclusions of the study area; the absence of scientific extension unit is behind the constraints confronting the community forestry activity; formation of local institution to administer the community forestry is the utmost need of the local people.

The main recommendation is; KSC should establish a separate extension unit in the administration level of the institutional forests to run the extension program.

بسم الله الرحمن الرحيم

شراكة الغابات بين المؤسسات والأهالي: حالة دراسة غابات شركة سكر كنانة

خلاصة الأطروحة

في العقدين الماضيين حدث تدهوراً بيئياً كبيراً في السودان نتيجة لإزالة الغطاء الغابي. ساعدت وشجعت سياسة الغابات لسنة 1986م المؤسسات لزيادة الغطاء الغابي في السودان. مؤسستان فقط هما اللتان قامتا بإنشاء غابات المؤسسات وهما: مشروع الرهد المروي وشركة سكر كنانة.

حتى في هاتين المؤسستين يوجد شح نسبي لتحليل ترتيبات الشراكة بين المؤسسة والمجتمع. وأكثر من ذلك لا توجد معلومات كافية لتوضيح العلاقة مابين الهيئة القومية للغابات واستراتيجيات وطرق التطبيق. لذلك اختيرت شركة سكر كنانة لهذه الدراسة.

الهدف العريض من هذه الدراسة توضيح طبيعة غابات المؤسسات بالتركيز الخاص على الاستراتيجيات الموجودة وتقييم غابات المؤسسات في السودان، وتقصي درجة نجاح غابات المؤسسات وإمكانية تحويل هذا النموذج لمؤسسات أخرى ومعرفة المعوقات التي تحد من هذا النشاط.
تم جمع نوعين من المعلومات المهمة التي تضم المعلومات الأولية والثانوية. جمعت المعلومات الأولية من خلال المقابلات واستبيان الإداريين والسكان المحليين.
كانت أهم النتائج من الدراسة: حدث تبني غابات المؤسسات من غير توصيف للاستراتيجيات والأهداف لغابات المؤسسات. تدار غابات المؤسسات لشركة سكر كنانة في غياب وحدة الإرشاد على المستوى الإداري للمؤسسة بواسطة الغاباتية غير المؤهلين في الإرشاد الغابي. بناءاً على اعتماد الإدارات على طريقة top-bottom لتوضيح المهام المختلفة للجان المعنية (غير منتخبة أو بإجماع عام) والتفويض بالصلاحيات. لا توجد اجتماعات عامة ولا زيارات منزلية لتشجيع إشراك المواطنين المحليين، وأكثر من ذلك رفضت الشركة إدخال عنصر الأشجار في الأراضي الزراعية. يتم تكوين المؤسسات المحلية وتفضيل أنواع الأشجار بواسطة شركة سكر كنانة.
خلصت الدراسة على أن غياب الوحدة العلمية للإرشاد هو خلف المعوقات التي تعترض نشاط الغابات الشعبية. وضرورة احتياج السكان المحليين لتكوين المؤسسات المحلية لإدارة الغابات الشعبية.
أوصت الدراسة بأهمية إنشاء وحدة إرشاد مستقبلية على المستوى الإداري لغابات المؤسسات في شركة سكر كنانة.

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CHAPTER I

Introduction

1.1. Background

Sudan is one of the largest countries in Africa. It is very rich in natural resources and has agreat potential for agricultural production, gifted by the River Nile and its tributaries beside a fair rainfall distributed over central and southern regions. The total cultivable area is estimated as 200 million feddans (84million hectares). In spite of this, it is classified among the least developed countries in the world, with a per capita Gross National Product (GNP) of (320) dollars. Loans from International Development Banks have virtually ceased and grant aid from bilateral donors is almost entirely limited to emergency assistance. Moreover, Sudan has a steadily growing population of more than (26) million inhabitants with diverse characteristics. Among other serious population problems are malnutrition (33% of children under five have chronic malnutrition), high illiteracy rate (47%) – particularly among women (53%) and low school enrolment (53.1%). Moreover, the long-dragging civil war in the south has ravaged the country, resulting in massive displacement of people to urban centres, where serious belt of poverty surrounded most cities. Successive natural disasters of droughts as well as rains and floods, which have annihilated schools, have further aggravated the situation (WFP, 2000).

The Wood and Forests Department was first established in 1902 mainly for managing the production of railway sleepers. Throughout these years the administration structure has been evolving according to the political, economic and enviromental situations. The Forests National Corporation (FNC) is the current governmental body responsible for managing and administrating this resource. It has been established in 1989 for reservation, management and protection of the forests in the country. The main amendments of 1932 forest policy are that the forest policy 1986 stressed the

point of recognition and encouragement of institutional forest. Moreover, the main contents of 1989 Forest Act classified the forests administratively under three categories among which is the category of the other forests. This category includes communal, private and institutional forests. These strategies rest on the view that each sector of society has a distinctive institutional competence to contribute to community forestry. Governments can provide resources and formal authority to local organizations. Support to companies and research institutes will enable them to develop participatory methods and provide project analysis and documentation. The development of institutional capacity in each of these sectors helps to ensure the long-term viability of community forestry. One theme that runs through efforts to achieve institutional transformation is the importance of informal and formal relations among government agencies, universities, companies, nongovernmental organizations (NGOs) and communities.

1.2. Scope of the study

Sudan's forests cover has dramatically decreased during the last twenty years. It is believed that the problem of mismanagement and degradation of forest resources in the Sudan is attributed to the failure or inadequate institutional structures related to the resources. The scope of the study focuses on the institutional forests. People at the local level often have considerable tree management capacity. This is because of their physical proximity to the trees, traditional or legal rights, and indigenous knowledge of conditions affecting land and trees, economic and cultural dependence on forest products and services and sometimes capability for resolving conflicts. Changes taking place in policy, markets and civil society are generating increasing interest in the prospects for private sector partnerships with communities or individuals for production of forest goods and services. Experience has shown that horizontal and vertical linkages are critical in developing sufficient institutional capacity to support community forestry. NGOs, universities and companies are

especially well placed to affect these linkages. In countries where strong collaboration among different sectors is not yet established, networks promote relationships among individuals and institutions working in a common area. This network attracted considerable interest both among policy makers in the relevant ministries and among those concerned at the local level with the management of forest resources.

In recent years, the notion that forestry could combine resource use and management with local economic development has been popular within international development agencies. There has been considerable emphasis on involving local people and institutions in forestry projects. Yet, agency sponsored activities have not often led to sustainable resource use, nor have they contributed much to local development, accordingly, many social forestry programs have stumbled along and eventually faded away. The downfall of these programs is partially a result of the isolation or non-integration of social forestry projects with the field of rural development and partially due to the fact that active participation and involvement of the local people was not sought.

1.3. Research Problem

Efforts to secure changes in land tenure that give more land to forest dependent people and changes in management practices that benefit local users depend upon transformations in the institutions charged with implementing community forestry. Specifically forest departments must develop their capacity to be decentralized in order to achieve a shift in power and authority to local users. Because formal authority and jurisdiction over public forestlands currently rests with government forest departments, a preprimary strategy of community forestry programs is to encourage institutional and policy changes within forest departments to increase the scope of local empowerment. A corollary strategy is to strengthen the capacity of NGOs and institutions to undertake new roles in

support of people-oriented forest management. In Sudan, the inclusion of the institutional forests in 1986 forestry policy as a possible remedy to environmental deterioration in the light of the decreasing large blocks of forest in the country was made in order to enhance and encourage all the institutions to adopt the activity. Unfortunately only two institutions in the country managed to establish institutional forests, namely; El-Rahad irrigated scheme and Kenana Sugar Corporation. Even for these institutions there is a relative paucity of development literature analyzing company-community partnership arrangements. Moreover, there is a lack of concern from the government of Sudan represented in the FNC about institutional forests. Accordingly, KSC has been chosen to study this problem. The KSC limited was established in 1975, with an ambitious plan to produce sufficient sugar to satisfy the home demands and export the surplus. Aware of its obligations to the local environment, KSC has initiated a project that have a profound impact on the region by minimizing and, hopefully, reversing deforestation in the study area.

1.4. Objective of the research

The broad objective of this study is to explore the nature of thecommunity-institutional forests with special emphasis on the emergence, strategies and evolution of institutional forests in Sudan. More specifically, the study attempts to;

1) Investigate the degree of success of institutional forest.
2) Explore the types of partnership between the FNC and the institution from one side and between the institutions and the local people.
3) Examine the sustainability of the institutional forests in terms of economic feasibility and rural development.
4) Assess the pitfalls and drawback of the institutional forests and the main constraints hindering the activity.

1.5. Hypothesis

To be able to assess the points mentioned above and the objectives set for the present study, some hypothesis were put forward for testing;

- KSC is financially capable of executing and managing the institutional forests:
- There is a sound company–community partnership for provision of forest goods and services.
- The objectives of the KSC coincide with the 1986-forest policy and 1989-forest act.
- There is no effective people's participation in social activities before the start of the institutional forest.
- Constraints limiting progress of institutional forests are both social and economic.

CHAPTER II
Literature Review

2.1. Introduction

For centuries, human populations have been able to live in harmony and balance with their natural environment, with slight or no depletion of the natural resources (Kurk, 1983). During the last decade particularly in the 70's there was a radical shift in the fields of agricultural and rural development. This was partly due to rapid growth of the rural population and their needs. Under these conditions, forests in many places were depleted. The forest dwellers' life enhance the process of the degradation by over exploitation and misuse of forests in which trees and shrubs were cut to meet the urgent requirements (Blackburn *et al.* 1982).

Tropical forests are being reduced annually at rates of about 7–5 million hectares of closed forest and 3–8 million hectares of open forest. These factors had contributed individually or collectively to the degradation of forests and forest resources, while there is a tremendous need for wood for different purposes (FAO, 1978). New policies and strategies, which are completely different from those designed to the traditional forestry programs, are needed to involve forestry services in rural and community development. International agencies, bilateral donors, and national governments felt the need to reorient their policy, philosophy and strategies to cope with the situation and offer assistance to the rural poor to ensure their commitment participation (Bochet, 1983).

It is useless to execute or manage any communal work without the active participation of the local population and sub population. This participation has to be undertaken with a total commitment from the early phases of project design through to implementation, since the development is the responsibility

of all members of the community (Mohammed, 1995). The active participation can be attained if the change that follow rural development and disturb the habit of the local people has been gradual and minimal at the first stages and coincide with a substantial improvement of the standard of living (Leach and Mearns, 1988).

2.2. Participatory Forestry

In Sudan, among the different options of the Forest Polices, there was special emphasis on the role of the forests in environmental protection and the establishment of community, private and institutional forests (*Ministry of agriculture & Forests, 19 96*). Participatory forestry as a concept is not new. It has been well established for centuries in many countries. The main functions of participatory forestry include establishment of protective forests and the creation of "village forest areas" or "urban phalloid areas" (Shepherd, 1990). During the last decade the understanding of the importance of forestry for local communities has been recognized and became apparent. To stimulate forestry and crop production in rural communities, new approaches should be worked out to overcome the various obstacles, which have limited the acceptance of forestry by local communities in the past. Gradually several responses to the limiting factors for forestry development in rural areas have been recognized (Wiersum, 1984).

The success of participatory forestry programs, irrespective of the models, depends largely on effective people's participation at various stages of their implementations. Many social forestry programs have stumbled along and eventually faded away. The downfall of these programs is partially a result of the non-integration of social forestry projects within the field of rural development and partially a result of implementers who did not seek the active participation and involvement of the local people (Sen and Das, 1987).

2.3. Conversion of woodland to agricultural lands

Kartodihardjo and Supriono (2000) demonstrated that the conversion of natural forests to timber and tree crop plantations, has impacted on natural forest and on forest dwelling people. Loggers, miners and rural communities all exploit forests in unsustainable ways in search of profits and means of subsistence. They are the primary actors of forest decline and their immediate motivation is the direct causes of deforestation and degradation. Forest decline is a complex socioeconomic, cultural and political event so there are no simple solutions to this complex phenomenon (Contreras-Hermosilla, 2000).

In Uganda and Malawi, there has been significant conversion of land from woodlands to agriculture. Tree cover has been more or less maintained over time in Uganda but has decreased in Malawi. There is a relationship between tenure and tree management. Tenure is linked to land-use and tree cover changes in both countries; though it is not necessarily the important factor, population pressure is the key driving force for land use change (Place and Otsuka, 2000). In Mali, with the advent of French colonial conquest, greater exploitation of forest resources occurred through land clearing for the expansion of cash cropping and the creation of railroads. Prior colonial era, agricultural production was concentrated on the subsistence food crops (Lai and khan, 1986). El-lakany (1994) showed that, in spite of substantial investment in expanding irrigated agriculture, productivity has not grown proportionally. Consequently, shifting and permanent cultivation is expanding into drier marginal land and/ or into forests, with consequent ecological and economic problems. The processes of land degradation manifested by the distraction of vegetative cover (particularly trees and wood lands), the loss of biodiversity, soil erosion, the loss of soil fertility and moving sand dunes have rendered this region one of the most desertification-prone areas of the world. Nevertheless, potential for forest development and the sound management of

forest resources does exist in the region, provided that proper policies are drawn up and implemented though as vitalized institutional structure.

2.4. The Evolution of Community Forestry in Practice

The scope of forestry for the people or forestry for development is old; it was brought for the first time in the first national forest policy in USA in 1894 (Mathora, 1985). Early initiatives understandably tended to become focused on those issues perceived to be of particular importance. Of these, the fuelwood shortage became far the most important. The early analyses emphasized the huge numbers of people affected. The growing burden placed on users of having to search ever further afield for fuelwood and of having to divert crop and animal residues needed for soil working or as livestock feed to fuel use (Eckholm, 1975; Arnold and Jonga 1978; FAO, 1981).

In the mid 1970s it had become apparent that development strategies narrowly based on industrialization were not working. The growing focus on rural development did much to draw attention to the dependence of rural people on forests and trees and the extent to which people in the developing world depend on wood as their main fuel for cooking and other household needs (FAO, 1989). The accelerated reduction in tree cover in Sahelian countries during and after the prolonged period of drought early in the decade, served to underline such thinking. Mounting concern over these overlapping problems led to a number of initiatives, at both the national and international level, designed to meet rural needs for fuelwood and other forest products in a more sustainable manner.

At the international level, FAO, with support from SIDA, organized a series of meetings to review existing experience and to define what was needed. This resulted in a seminar 1978 state-of-knowledge publication: “Forestry for Local Community Development” (FAO, 1978). FAO's programs were radically

restructured to give effect to this, and FAO and SIDA launched a special action program to heighten awareness of the importance of "community forestry" and to help individual countries initiate or upgrade field programs in this area. Also in 1978, the World Bank issued its influential forestry: Sector Policy Paper which signaled a major shift in its forestry activities away from industrial forestry towards environmental protection and meeting local needs (World Bank, 1978). A further initiative by the World Bank in 1977 led to the creation of ICRAF, an organization to promote research in "agroforestry". A series of international meetings, notably the 1978 Eightth World Forestry Congress, which was devoted to the theme: 'forests for People', served to give the concept of community forestry rapid and intensive exposure. By 1979, field projects and programs were already taking shape.

2.5. Concept of Community Forestry

A community is a group of people living in a clearly defined geographical area, sharing the same culture and vital interests, with social bodies formed to help them meet their basic needs and who work to maintain these bodies, which creates the feeling of belonging to the community (Bochet, 1983). Kennedy (1985) defined forestry as the management of forest resources to provide a satisfactory amount and mix of social values (consumptive and non consumptive) for clients, while protecting these values and uses for future generation. Thus community forestry or social forestry which sometimes gets called participatory forestry is an approach in which rural people grow plants or manage trees in conjunction with foresters (Shepherd, 1990). Participatory forestry has been defined as forestry activities executed by local people sometimes with outside assistance to improve their own welfare (Mlenge, 1991). Therefore, the main focus in participatory forestry is on community involvement. Under this issue community forestry is defined as any situation which infinitely involves local community residents to improve

their own welfare, so the basic focus of a community forestry project is the involvement of the local people (FAO, 1978).

The community forestry activities in tropical countries propose three essential goals for development: Sustainable productivity; equity in the distribution of benefits and burdens of productivity; and a sense of cultural and ecological continuity (Burch and Grove, 1993). Davis-case (1989) showed that social forestry has the following components:

- *Woodlots in areas which are short of forest products for local needs;*
- *Growing of trees at the farm level to provide cash crops (agroforestry);*
- *Processing forest products on the household and small industry level to generate income in the community;*
- *Forage bank*
- *High way and canal plantation.*
- *Cook stoves to reduce the pressure on forests and*
- *Windbreaks and shelterbelts to provide protection to the productive lands.*

For community forestry to succeed, the identification of its products must take place early, therefore systems of early returns are essential, and become important in case of poverty (Mlenge, 1991). Communal projects, which fulfill at least 10% of the communities need, are too small to be of value (Gebre, 1990). The success of community forestry depends on the enabling features, which are known as critical requisite. These requisite are: political support through the government; willingness of the local community to participate; existence of a facilitating agency and flexible institutional framework to secure interagency at working level (Tewari and Mascarenas,

2.6. Recent trends in forest policy, legislation and institutions

Forests should be given institutional status as global common resources (Myers, 1995). Barr, *et al.* (2001), stated that decentralization policy world generate revenues from forests provided that policy should be accompanied by institutional capacities to manage rapid forest exploitation and overcome conflicts claims. Ostuka and Place (2001) showed that the best strategy for managing land and forest resources lies in promoting the establishment of property rights and investment in the improvement of the natural resources base. Strengthening institution and human resources development needs more attention nationally and from donor agencies (Sayer and Palmer, 1995). Ishizaki and Oka (2002) showed the development of forest policy in Japan which focused on programs used for land conservation and through contracts with various types of owners participation.

In pre-colonial times, traditional rulers and institutions in Mali established and enforced regulations governing the use of common resources such as pastures and traces. Often, laws were enacted prescribing severe punishment for the illegal cutting of certain trees such as the case with *Acacia fedlherbia*, where the offenders were punished by lopping their lands. Trees were also protected for religions reasons, as in sacred groves or burial grounds, or for more practical benefits, such as shade and fencing. Allocation of land use rights was held in trust by the elders and passed down to individual and families through his eager. The forestry code was essentially astrictive and punitive and the accompanying system of permits and fines become the normative structure within which foresters market.

Antagonism rapidly developed between foresters and villagers due to the expropriation of wood fallow land (considered vacant and without ownership) to create state forests and due to the emergence of abusive and randomized fining practices. This traditional role of that forester and the negative consequences as on forester-villager relationship was a key constraint which must be overcome if the forester is to become an effective catalyst in social

forestry development. The current version of the forestry code, low No.68.8aN.RM, went to effect in1986, but retains essentially the same elements as the code land down during the French colonial area (Lai and khan, 1986).

It was demonstrated that most countries have regulations and an administration for the forestry sector, within which forest management was implemented. But often the laws are out of date and are neither enforced nor enforceable. Institutions are weak and are not adapted to their tasks. Change is needed to create an enabling, incentive framework that will give the people of every intersest group a voice in the decisionmaking process and a share in the benefits of forest management. Institutional actions must be done were following:

- Develop forest policies that promote sustainable forest management in the broadest sense.
- Reform forestry legislation and regulations to provide a consistent and comprehensive framework for the long-term sustainability of forests and for the participation of people who depend on them for their management.
- Strengthen forestry services and staff capabilities (by training and motivation of staff through incentives, organization, etc. as appropriate) to provide advice support for the implementation of sustainable management programs that are economically feasible, socially accepted and environmentally sound.
- Promote collaboration and coordination and a multidisciplinary approach among institutions invoked in all aspects of land use.
- Provide training to all involved in rural development (including forester and agricultural staff) in participatory planning and management, with emphasis on the linkages between forest management and sustainable development (FAO, 1993).

Romberger and Mikola (1970) reported that the institutional framework of forestry clearly has an important bearing on the type and intensity of management adopted. This is particularly true of forest enterprises owned by wood processing firms and state forest services. A look at it as changing forestry administration is of interest for several reasons. The variety of forest formations, their differing levels of productivity and the strong economic and social imbalances currently prevalent in Italy have greatly diversified both the problems and the local forestry policies. This diversity has in turn educed a mosaic distinctive form of institutional organization within a relative geographic area. At the same time, the Italian forestry administration, like the other public institutions, has been extensively restructured during the past five years, and the newer forms of administrative decentralization have often led to institutional clashes (Pettenella, 1994).

In 1990 Mozambique adopted a new constitution based on a multiparty electoral system. It paves the way for the growth of a professional administration and an institutionalized decentralization of decision-making process away from the national and province capitals to the district level and blow. In addition, between 1975 and 1990, Mozambique developed a national legal code but provincial judges interpreted the national code in light of local perceptions of justice. As a result, a heterogeneous body of judicial opinion has developed. The new constitution does not specifically recognize these heterogeneous opinions, nor dose it forbit them. Thus, they are two avenues through which local legal concepts about land and its products may enter the written code the legislative route and the courts (Wynter, 1993).

Africa is the developing region where lack of institutional capacity has most impeded the establishment of sustainable forest development programme. The implementation of structural adjustment programmes and rapid public sector reform often tends to further weaken existing institutions. Land use policies are, often poorly designed and implemented. A lone, the forestry

administrations cannot cope with all their responsibilities. A wide verity of institution such as government agencies, private companies, local community organizations and research and extension institutes will all have to be involved in forestry development. Institutional strengthening is top priority and every effort should be made to attract private sector and donor interest to this activity, in which many project are already involved. Discipline and professional ethics in forest management are essential to win investors confidence and to attract the new professional skills that the sector lakes (Blanchez, 1997).

As a corollary to the policy and institutional development, recent years have witnessed a significant acceleration in the revision of forest-related laws around the world. Not surprisingly, the results of these law reform efforts have been extremely varied. They have taken place within the context of vastly different legal and political traditions, reflecting a wide range of economic, ecological and social variables. It is possible, nevertheless, to identify several trends that have achieved prominence after the last decade. Broadly speaking, forest law in the 1990s is moving away from a regulatory approach focused primarily on government management and policing of forests as economic resources. It increasingly recognize the multiple interests involved in or affected by forest management, with greater attention given to the environmental and social roles of forest resources and a new emphasis on the involvement of a wider range of public and private actors. (FAO, 1999).

2.7. Local people participation in forestry activities

Byron and Arnold (1997) showed that the importance of forest products to household living in or near forests has been increasingly recognized. Estimates of numbers of people who in some way rely on forests, for survival or livelihoods, vary widely. Yet numbers alone do not reveal the forests, importance to diverse users. A typology that recognizes the varied relationships of people to forests and forecasts products permits assessment of the impacts of

economic, cultural, and social changes. Understanding these relationships is crucial for institutions to adopt to changing partners of demand, use and supply, and to support both forest "dependent " and "forest related" peoples. Clean Development Mechanism (CDM) of the Kyoto protocol will have the dual mandate of reducing green house gas emissions and contributing to sustainable development. It is not yet clear what, if any, forestry activities will be eligible for CDM. Nor is it known what rules will glue the implementation of CDM project. These decisions have important implication for poor people who live in and around forests in developing countries. Suitably designed CDM forestry project can significantly benefit local people communities by supplementing and diversifying income, increasing access to forest goods and service, improving land productivity, developing the local knowledge base and local institution and increasing the energy efficiency of using forest products (MacDicken *et al*. 2000).

In Senegal, community and institutions participation was therefore seen to be an essential requisite from the early 1980s. This first translated is to inclusion of community components in some of the large-scale projects, particularly the reforestation and forest development project. Operation gradually becomes in area singly community-oriented, a focus that crystallized into a priority policy with the new forest Development Frame Work plan. Thus, the community reforestation project in the groundnut belt was established in 1982 with a mission to define a rural forestry strategy that fully involved the local Communities. A new relationship was created between the forestry administration and the local populations, with the idea that the later would play a full role in the rehabilitation and management of forest resources (Gueye *et al*. 1994).

The reconciliation of conflicting intersest, which has been as a posited challenge of forestry legislation, must be faced throughout policy formulation. It requires not only identifying interests involved, but also involving them

sufficiently in the formulation process. So people may be confident that their views have been heard. The process of formulation and the contents of forestry laws are being profoundly affected by the concern for a broad participation and recognition of all interests, although the details vary enormously as might be expected at this experimental stage. Legislation alone is not sufficient to ensure a successful programme to include local communities; this requires the identification of bodies at the local level to represent local populations, which may already exist or may have to be created, and generally the actual implementation of provisions for local participation. Creating legislative provisions for Community forestry is therefore one of the greatest challenges facing the forestry lawyer (Cirelli, 1993).

Recent changes in forest policy and legislation reflect support for increased involvement of the private sector (forest owners, forest industries, NGOs and Community-based organizations, indigenous people and the general public) and local government units in forest management. Privatization, devolution and decentralization, recognition of indigenous people's rights to ancestral land and participatory approaches to forest management have all leed to changing roles of forest administrations and new types of forest managers. As oversells of both internal and external processes, stemming from the growing recognition over the past two decades that active stakeholder participation is a key element of sustainable forest management, a variety of approaches to increasing the participation of local communities in natural forest management have developed.

The past few years have seen a significant acceleration in the implementation of community-based forest management programmes and considerable improvement in the result as experience, both good and bad, has accumulated. In Africa for example several countries have adopted Community-based forest management as their main strategy for managing forest resources. These initiatives have certain features in common. For example, the community gains

secure rights to the use of resources on forestland, rather than ownership of the land itself. Another is that even though the responsibility for managing forest areas is either shaded or shifted primarily to the user manager, the authority in most cases continues to lie with state forest administrations. This, if conflicts arise between the state agency and the user group, the state agency usually has the authority to resolve the dispute. In general, government support of local forest management is increasing, partly as a consequence of the positive result being obtained, but also because of diminishing financial and human resource at the center level. Although participatory forest management has been implemented over a relatively short period. Information is emerging which indicates that these approaches are having a positive effect on the condition of forest resources. This is partly because the direct acrual of benefits to local communities, gives them greater incentive to manage and conserve forest resources actively.

Community-based forestry had positive environmental impacts, like benefiting of water supply, soil erosion control and biological diversity. Also it had social and economic benefits, including strengthened local institutional capacity, improved relations among stakeholders (particularly communities and forest developments), increased product flows, greater product diversity and better access to markets. A major challenge to be met in the future is to improve links between forest policy and ground level implementation. Policy formulation needs to incorporate the experience of local-level forest users and managers, both traditional and non-traditional, and forest policies need to be better understood, accepted and effectively implemented at the local level (FAO, 1999).

2.8. Benefits of participations

Carmen Mollinedo *et al.* (2001), concluded that sustainable forest management significantly contributes to family economy. The benefits from sustainable

forest management are significantly related to marketing of non-wood forest products. Employment generation and harvesting of goods for shelter and food security are also important. The most important benefits come from timber production, which had positive financial indicators in communities. Ghana's tropical High Forest contributes substantially to the domestic needs of the country and provides both economical and social benefits to the people. Several species termed-lesser utilized are under-utilize. Enforcement of rules on logging, policy reforms to include collaborative forest management, tree planting incentives, log export bans…etc, have had an impact on conservation. Tolko (2000), stated that sustainable forest management led to the quality of life for many communities by providing a wide range of environmental, social and economic benefits.

There is a growing concern about environmental change, locally and globally, and the need to control this through more sustainable development. The heart of the problems is to achieve a balance between the needs of all people; to recognize that changes in forest health have multi impacts on both local and global environments (CIFOR, 1997). Trees and forests play a vital role in traditional production systems, providing a range of products such as fuelwood, wood for construction and artisan purposes, fodder, fiber, foods, gum and other secondary products. An equally important role is that of maintaining soil fertility and stability (Lai and Khan, 1986).

According to Deal (1974) the planting of trees in itself is a major for conservation. Trees stabilies and in many cases improve the soil, prevent silting up of rivers and lakes, temper the microclimate and increase the wildlife holding capacity of the land they cover. Many of the world's disasters in respect of soil erosion have occurred because of the absence, or removal and non replacement, of trees.

2.9. Indigenous knowledge and sustainable forest management

It was demonstrated that indigenous forest management practice is considered a major activity in community forests. The users fulfill the forestry products by removing dead and diseases trees. The concept of retaining trees per hectare was not fully implemented in community forestry. The contractor system was found to be effective in forest management. Forest product distribution in equity basis encouraged individuals to work effectively for forest management where as equal distribution invited in effectiveness (Pokharel, 2000).

Saxena (1997) reported that after about a hundred years of exclusive government control, forests in India are now being increasingly managed with people's participation. Almost all states in India have passed enabling resolution to facilitate what is now popularly called the Joint Forest Management (JFM) programme. However its implementation has so far been uneven. Field officers are often loath to share power and authority with the people, while expecting them to protect forest without wages. It is also not very well known under what conditions JFM succeed and whether these conditions are internal or more influenced by government policies.

Many local communities, including a significant number of indigenous groups, live in and around forest areas. They are primary users of forest products and them often create their own locally adapted and accepted rules for how to use the forest part of what is often referred to as local institutions support for increased local access to and control of forest resources for these groups, thus legitimizing their role as responsible forest managers, has proved to be a constructive strategy to achieve sustainable forest management (Anderson and Ourtiz-Chour 1996).

2.10. Company- community forestry Partnership

From the 1980s, local populations were asked, in Senegal to collaborate extensively with forestry service to achieve more radical and decisive intervention. The forestry service adopted an approach more in tune with the times: sustainable rehabilitation and the conservation and management of the national forest heritage. The previous repressive attitude gave way to a greater focus on local communities and their close relationship with the forests as well as on building a constructive partnership for the management of forest resources for the benefit of present and future generations. This change in attitude was accompanied by substantial institutional changes which gradually led the forestry administration to develop:

- a participatory approach in place of it's authoritarian manner;
- an educational stance in support of this participatory approach; and
- an integrated as opposed to sectoral policy (Gueye *et al.* 1994).

2.11. Forestry ownership

Forestry ownership varies from country to country, but virtually all countries have state (government) forests and any other forms of ownership, including some centrally planned economies have private forests (Hummel, 1984). The problem of land ownership is one of the most serious problems in the history of forest lands. The forest ownership pattern has several implications for forest policy (Sakkas, 1978). There are several types of ownership as explained in the following section:

2.11.1. The state forests

State forests offer continuing of ownership and this is favorable for long rotations of trees. Ownership by the state or other public authority is also an advantage where protection of the environment is important. Against these advantages there are some disadvantages. For example the ease with which new ideas may be implemented in state forests has led in some countries to rash

innovations on large scale which proved unsound. While the general standard of management is high in state forests, there is less scope for integrated landuse and for updating management to local circumstances than in the woodlands belonging to a farmer or a local community (Saouma, 1979).

2.11.2. Individual forests

The average size of private forest holdings is usually small, even countries with large privately owned forest estate. The disadvantages of fragmentation may be reduced if the management of woodlands belonging to several owners can be coordinated (Hummel, 1984).

2.11.3. Communal forests

In several countries, forests belonging to local village communities constitute a significant proportion of the country's forest estate and have been of great benefits to the communities concerned (Holopainen, 1981).

2.11.4. Institutional forests

In many countries around the world, forests in large blocks are decreasing and forest farms are consequently growing in importance, so an increasing number of forestry partnerships pertain to goods and services produced outside the forest.

Two major trends are influencing and drawing attention to the collaboration of private companies and communities. Political pressures for local control; and globalization of markets, capital flows and technology. On one hand, increasing attention is being put on forestry as a tool for local empowerment; whereby previously disadvantaged communities and individuals benefits from taking effective control and responsibility for decision-making regarding their forest assets. On the other hand, this often occurring in contexts where, through privatization processes and growing use of market-based policy instructions,

private-sector control of forest resources and land is increasing. With increased pressure on local land, relationship between the private sector and local actors are becoming more common, but they are not always beneficial for both parties (Mayers, 2000). There are other forms of forest land and ownership like cooperatives forests, monasteries and forest owned by individuals (Mohammed, 1995). In the Sudan they are two types of forest ownership namely; state forests and private forests. The private forests consist of three categories; communal forests, forests owned by individual (on an individual basis) and institutional forests.

2.12. Participatory Forestry in Sudan

The practice of participatory forestry through the traditional agroforestry systems based on Hashab, Haraz, Gimbiel and Gaggag, as practiced by the sedentary people on the gum belt zone and lower slopes and highlands of the Jebel Marra massif is not new. Trees have been retained primarily for food, wood, fodder and a source of income. This system has been able to sustain self-sufficiency of a densely settled population over centuries (Miehe, 1986). El Mahdi and Mahony (1990) showed that in Sudan, social forestry projects take one of the following models;

- Participatory forestry on state land (taungia cultivation). This is practiced in refugees camps at El Gadarif, (Finish Forestry Company (ENSO), Rawashda (FAO), Gash delta (KADA), Ed Damer, Quala en Nahal (ACORD).
- Social forestry project administered by FNC on communal land (super management model). This is practice in Tendelti area (FINNIDA) and Kordofan (UNSO).
- FNC as extension agent (support service model). Practiced in Kosti, Medesis (CONCERN), Central and Eastern Regions (FAO), Kordofan (CARE) and UM Ruwaba (SCF).

- Community project supported by FNC (partnership model). Practiced in Shendi (SOS), EL Damer (UNSO) and Wad Bireima village woodlot (FAO).
- Community forestry project with assistance of intermediary. Practiced in Gezira and Rufaa (IRISH AID/PLAN SUDAN), Kassala, Hafarat village, Khartoum (FAO).

In Sudan, among the different options of the Forest Polices, there was special emphasis on the role of the forests in environmental protection and the establishment of community, private and institutional forests (Ministry of Agriculture Forests, 1996). Participatory forestry as a concept is not new. It has been well established for centuries in many countries. The main functions of participatory forestry include establishment of protective forests and the creation of "village forest areas" or "urban phalloid areas" (Shepherd, 1990). During the last decade the understanding of the importance of forestry for local communities has been recognized and became apparent. To stimulate forestry and crop production in rural communities, new approaches should be worked out to overcome the various obstacles, which have limited the acceptance of forestry by local communities in the past. Gradually several responses to the limiting factors for forestry development in rural areas have been recognized (Wiersum, 1984).

The success of participatory forestry programs, irrespective of the models, depends largely on effective people's participation at various stages of their implementations. Many social forestry programs have stumbled along and eventually faded away. The downfall of these programs is partially a result of the non-integration of social forestry projects within the field of rural development and partially a result of implementers who did not seek the active participation and involvement of the local people (Sen and Das, 1987).

CHAPTER III

The Study Area

3.1. Location

This study covers the irrigated area of Kenana Sugar Company (KSC) Limited. The company's area lies between latitude13º 05N, longitude 33ºE and altitude 410m, in Jablain province of the White Nile state. It is near Rabak town on the eastern bank of the White Nile, about (290 km) south of Khartoum and (1200) km from Port Sudan (Fig. 3.1).

3.2. Vegetation

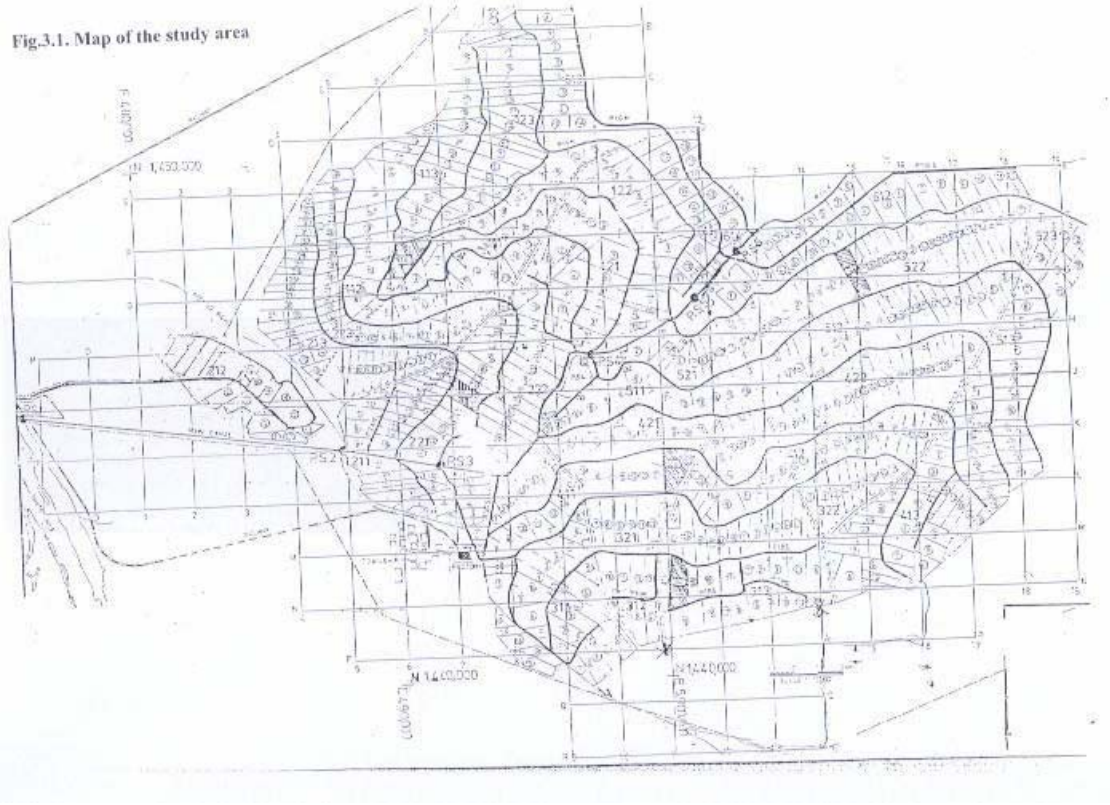
The present area of KSC lies in the vegetation zone of low rainfall savana woodland. The main tree species are *Acacia seyal* (Talih), *Acacia senegal* (Hashab) *and Acacia mellifera* (kiter). *Acacia nilotica* subsp. nilotica (Sunt) is found in depressions, while *Comberetum spp.* (Habiel) is found in knolls and well drained sites, beside *Balanites aegyptiaca* (Heglig) (Harrison and Jackson, 1958). However, the vegetation in the study area includes *Eucalyptus spp.* (Ban), *Azadirachta india* (Neem) and *Albizia lebbeck* (Degn-Elbasha).

3.3. Climate

The site climate is tropical semi-arid with summer rains. The prevailing climatic conditions since 1977 are presented in table (3.1).

Rainfall fluctuates between years with an average amount of (89.1 mm) and (641.8 mm) recorded in 1984 and 1988 respectively. The general annual mean for the period 1977-1988 is (355.1 mm). Rain can be expected as early as April and end by October. However, rainfall is usually between June-September (85% of annual rain), and (56%) of the annual rainfall in July-August.

Fig.3.1. Map of the study area



Temperature ranges between (19.0^{o}C) and (38.8^{o}C); the coolest months of the year are December, January, and February while the hottest months are March to June. The lowest mean minimum temperature recorded in January 1983 was (11.0^{o}C). The prevailing temperature is generally conducive for plant growth all the year round provided that soil moisture is not a limiting factor (Gadalla and Warrag, 1992).

3.4. Geology and soil

The site is on the southern part of Sudan central clay plain landscape. It is a flat plain with gentle slope towards Khor Keleikkis and the White Nile with underground geological composition of basement complex rocks. The whole area is covered with thick superficial deposits of fine alluvial clay deposited by the Blue Nile River (Gadalla and Warrag, 1992).

The soil is alluvial classified as vertisoil with uniformly heavy cracking clay except in the uppermost layer which is some what friable with clay content more than (60%). It is moderately alkaline, calcareous, non-saline, none to moderately sodic, and a soil pH ranges between (7.8) and (8.6). This can generally be considered as suitable for common tropical forest tree species.

Table (3.1): Climatic conditions of the study area (1977-1991)

Year	Mean wind speed (km/24hrs)	Average temperature (c^o)	Relative humidity (%)	Total rainfall (mm)
1977	279.6	27.4	57.1	302.5
1978	254.4	27.2	57.1	286.3
1979	226.4	27.9	54.8	491.6
1980	172.4	26.8	56.0	359.2
1981	160.6	28.1	53.5	210.4
1982	132.0	27.5	53.4	244.7
1983	138.4	27.8	53.9	288.4
1984	156.2	28.4	51.3	089.1
1985	180.9	27.4	56.4	296.5
1986	170.1	28.0	47.4	428.2
1987	175.3	27.9	49.0	287.5
1988	174.3	28.1	53.3	641.8
1989	172.3	27.2	60.4	523.0
1990	171.6	28.0	50.2	279.9
1991	-	-	-	202.1
Mean	181.9	27.7	53.9	328.8

Source: (Gadalla and Warrag, 1992).

3.5. Population

According to 1983 Sudan National census, Rabak area council (consisting of Ashaya, Almarabea, kenana, Shawal, Rabak and Aba island town councils) population was (192620). Population estimated as extrapolated from 1983 and the estimated annual per capita consumption of wood is as follow:

(Table 3.2): Population and consumption of wood in the study area

Year	Population estimate	Annual per capita wood consumsion
1999	243060	1.785 m^3
2000	315755	2.550 m^3
2001	325070	2.635 m^3
2002	334660	2.720 m^3

Source: (Gadalla and Warrag, 1992).

Kenana Town council and Jablain Rural council population is (32825) according to 1983 census. The population for these two councils is estimated to reach in years 1999, 2000, 2001, 2002, about 41420, 53810, 55395, and 57030, respectively. The per capita annual wood consumption is similar to the above for the same period. This indicates that wood demand exists and will increase with population increase, especially with the current forest removal in that region. The main tribes in the study area are sabha, selame, kenana and habania besides some other minor tribes.

3.6. Environmental deterioration

The rapid depletion of woodlands has severe ecological consequences. The conversion of woodlands into farm lands and the scarcity of the wood products such as fuelwood, building poles and timber are contributing factors to deforestation.

3.7. Forest and forestry activities

The forests sites are scattered in and around Kenana`s six areas of sugar cane fields. These sites are about 230km from Kenana Township. Forestry belts North West of the Kenana factory are some seven thousand feddan in area. As a result of the National Forest Policy of 1986, which stated that an area of (25%) of geographical area of the country to be reserved as forests and after the

success of the project economically, another thirteen feddans have been added to the forest area. This has been undertaken to achieve the strategic plan of the company, which was targeting to grow twenty thousand feddans of forest plantations, mainly Hashab (*Acacia Singal*) and Eucalyptus spp. There is an old nursery consisting of three units, the capacity of which is 600,000 seedlings/ annum. Recently, two nurseries, under construction now, the capacity of which will be double the old nursery allowing the company to go for commercial production. The project also consists of an arboretum including (56) tree species up to date serving experimental and academic purposes. Table (3.3) shows the main tree species in the arboretum.

Table (3.3): main tree Species observed in KSC arboretum 2002

Latin name	Local
Dalbergia sisso	Sisso
Gravilia robusta	Silvery oak
Cordia africana	Gembeel
Ceiba pentandra	Silk cotton
Oxytenanthra abyssinica	Ganna
Eucalyptus citriodora	Kafur
Eucalyptus camalduelensis var. walshriver	Kafur
Eucalyptus camalduelensis var. Petford	Kafur
Eucalyptus cloesiana	Kafur
Eucalyptus grandis	Kafur
Eucalyptus tereticornis	Kafur
Gmelina arborea	Gmlena
Diosperus mespiliformis	Algoghan
Anogeissus leiocarpus	Sahab
Faidherbia albida	Haraz
Moringa oleifera	Morngia
Acacia polyacantha	Kakmot
Acacia torilis var. radiana	Sayyal
Khaya senegelensis	Mhogani

Source: (Gadalla and Warrag, 1992).

CHAPTER IV
Methodology

4.1. The study area

The institutional forests in the Sudan are found in two sites, namely; Elrahad Irrigated Scheme and Kenana Sugar Company Limited (KSC Ltd.) KSC institutional forest was selected for this study because it is easy to reach, richness of different forestry activities and existence of different tree species. Moreover, KSC institutional forest is under efficient management system a situation made the field of forestry highly organized, accordingly, the necessary information could easily be obtained.

The KSC institutional forest consists of six areas or villages, namely; area one, area two, area three, area four, area five, and area six. The forestry belt covered the north west of the factory as institutional and community forests. Those villages (areas) were divided into sixteen camps. In these camps live the natives who work as permanent or temporary labors in the company. They also participate in the forests activities. The sample size of the respondents (inhabitants) was predetermined to be as 25% of the households of each selected village. A sample of four villages, representing more than (66.6) % of the total number of villages, were randomly selected. Ten forest officials were requested to respond to a self -administrated questionnaire.

4.2. Types of data selection

Two types of data were collected, namely; primary and secondary data. The primary data includes: interviews with local inhabitants, self-administrated questionnaire with the administrators of the institutional forest and personal contact with FNC personnel in the study area. The primary data were principally collected to evaluate the social and economical impacts of the institutional forest in KSC Ltd., and its contribution to rural development. The

source of the secondary data includes: annual reports of the KSC Ltd., concerning forestry sector, project documents, papers and workshop out put about institutional forestry.

4.3. Methods of primary data collection

The primary data was collected from three groups, namely; local inhabitants, forests employees and FNC personnel in the headquarter and the study area. All the methods of data collection have dealt with same items covered by the research hypthesis mentioned in chapter one. Accordingly, the respondents were asked different set of questions that deal with the institutional forest. The FNC personnel in the study area were contacted personally and information in more details about institutional forest, costs, sales etc … were collected. Using different sources for data collection was made to overcome the bias and ambiguities that may arise during the data collection and contribute to the shortcoming of the questionnaire. The forests officials' self-administred questionnaire was made first in order to find answer to common questions in order to avoid repetition and to check items for local inhabitants interviewed.

4.3.1. Local inhabitants interviewing

The first set of data was collected from local people (inhabitants) participated in the forestry activities using structured questionnaire. An appropriate random sample representing (25%) of the household from each selected village was made for data collection. The selection of local people was made randomly according to their existence at their camps during data collection visit.

4.3.2. Self-administered questionnaire

The second set of data was obtained from the forests employees using self-administrated questionnaire (Appendix 2). The questionnaire was given to the espondents as homework since the respondents were busy during work hours, being literate, able to follow written instructions, understand the investigated

issues, and sufficiently motivated to complete the questionnaire on their own, the task appeared to be feasible. The objective of this questionnaire is to: collect general information with a reasonable depth about the working strategies of the institutional forests, their activities, incentives, motivation and the management systems.

4.3.3. Personal contacts with FNC personnel in the study area

This method was made for the collection of the secondary data. Some information that could not be collected by the questionnaire was obtained through personal communications with FNC personnel. Further data like investment in the forestry section, costs, revenues etc … were obtained from official documents. Social contribution and implications of the forestry section on the environment to the local community was extracted from official figures, views, and reports were also collected.

4.4. Construction of the questionnaire

The questionnaire was distributed in four randomly selected areas (6, 5, 4, and 1) representing 66.6% of the villages within KSC estate. It was constructed according to guidelines of Ebeedat* et al. *(1997) and personal contacts with some specialists. The following points were considered:

- To be certain that questions were relevant to the research problem and objectives of the study.
- To ask an important direct questions that the respondents can be able to answer.
- To express each question as simply as possible.
- State questions in specific concrete terms.
- To state the items in simple language that the respondents use in every day conservation.

- To include active components in the questionnaire which attract respondents to reply attentively.
- To record promptly all information in the documents in order to win the respondents confidence.

Two types of questions were used in the questionnaire;

1) Closed-end questions, with mostly multiple choices or yes and no style of answers or tables.
2) Dichotomous questions in step-wise style, each answer leading to specific set of follow-up questions with no open-ended questions, except where it is inevitable. This type of questions were used in the questionnaire in order to:

- Make the least demands up on respondents.
- Permit quick, efficient collection of data.
- Permit easy, quick and accurate analysis of answer.
- The combination of questions and associated response categories sometimes help respondents to understand the questions more clearly.
- They are more useful in obtaining answers to sensitive questions.

The open-ended questions were avoided except where it is inevitable because of their negative draw backs, which includes:

- The difficulty of constructing questions at the proper level of generality.
- Responses are difficult to analyze and summarize.
- They may impose considerable burdens on responders and interviewees.
- They are more likely to produce irrelevant and worthless data.

4.5. Organizations of data

The conceptal step was followed by the organization of questions. The following guidelines were considered:

- To begin with simple, easy to answer questions.
- To place sensitive or more complex questions later in the questionnaire.
- Where it makes sense, to place the items in logical order.
- To try to create an interesting mix of items within the questionnaire.

An introduction was set to the questionnaire at the top of the first page or face sheet of the questionnaire. The introduction was written in short, simple sentences understandable to respondents. It was followed by:

- Identification of the person conducting the research.
- Explanation of the purpose and importance of the study.
- Assurance that answers would not be disclosed to any body else to assure confidentiality.
- Explanation that the respondents were selected at random to make them at ease in answering frankly.

4.6. Pre-testing

The formulation of the questionnaire was followed by a pre-test step to discover and correct any flows in it. The purpose of the pre-test is to make sure that the questionnaire would deliver reliable and valid data for answering the problem under investigation.

The final year students of Faculty of Forestry, University of Khartoum, as a part of their study course, were asked to critique the questionnaire, and to estimate how the respondents will be able to respond to the questionnaire. According to the comments of the students, the draft questionnaire was revised. Finally, the supervisor checked the questionnaire, and accordingly,

some questions were removed. After the pre-testing, the contents of the questionnaire were materialized into simple forms with minimum items to obtain necessary information. The questionnaires were finally revised and printed (Appendix 1).

4.7. Permission for data collection

Prior to the start of the data collection, the General Manager of the FNC was informed about the nature of the research and the study area. A request letter was addressed to the General Manager of the FNC to issue an order to the forest officers in the study area to offer the possible assistance and to help in data collection.

After reaching any selected village, the first step involved obtaining permission from local authorities before conducting the survey. This permission is certainly recommended for surveys in rural areas where the residents may be more suspicious about outsiders. The permission was taken from the local authorities. The leaders were also asked to convince the local respondents to cooperate in conducting data collection.

4.8. Data processing

Raw data collected was first put in chart tables through converting qualitative data to quantitative data following coding method.

4.9. Statistical analysis

The statistical analysis was commenced through exploratory manipulations of the data obtained in the study area. This process was accomplished by critically examining the data through the use of simple techniques of analysis. The main tools are the construction of simple tables and selected cross-

tabulation which allows tentative answers to many of the questions being asked in the survey.

Data collected was put in spreadsheets, in summary sheets and converted them to tables or histograms where necessary, some reports, and other data obtained were subjected to further analysis. Descriptive statistical analysis techniques such as frequency distribution and percentage were used to analyze the data.

CHAPTER V

Results and Discussions

5.1. General characteristics of the respondents

5.1.1. Family size and educational level

In rural developed areas family size is an important variable for the success of the agricultural activities where the household members considered as the main source of laborers. According to the yielding sugar from cane crop and planting trees to conserve the ecological balance in some rural developed areas, the household members conducting all the agricultural activities and the industrial process usually takes place through technical labors. In the study area the majority of the respondents (62%) showed that their household consists of less than six members (Table 5.1). The rest of the respondents (38%) have family sizes consists of more than six members particulary those of village (4) compared to the other villages (13%). This indicates how heavy the burden is imposed to procure sufficient income to meet the daily needs of each household beside the degree of reliance on natural resource for the provision of fuelwood and building materials. Most of dwellers rely on wood materials for the construction of their houses.

The educational level could be considered as a monitor to detect the possibility of creating changes in attitudes and raising of awareness for the sake of conserving the environment in the study area. As far as educational level is concerned, it varied between Khalwa level and university education. From Table (5.1), only 6% of the respondents had the chance to pursue their education to university level while 53% of the respondents have education to secondary and high school level. The rest of the respondents either had primary (25%) or Khalwa educational level (16%). The high level of education might be attributed to the fact that the company built schools in order to settle the nomads around the factory. So the situation is favorable for extension

programs, training courses and formulation of sound legislation and policies since the literates are able to read and write and follow instructions. This situation facilitates the use of the different extension methods (audiovisual and posters beside other methods) for the dissemination of information. Bear in mind the company provides the necessary infrastructure for the extension work represented in the establishment of scientific research department and a vocational and technical training center.

Table (5.1): Educational level and family size of the respondents

Village	N	Family sizes		Educational level			
		3-6	>6	Khalwa	Primary	Secondary & high school	University
Village 6	25	17	8	6	4	15	-
Village 5	25	17	8	2	2	19	2
Village 4	25	12	13	5	8	11	1
Village 1	25	16	9	3	11	8	3
Total	**100**	**62**	**38**	**16**	**25**	**53**	**6**

N= number of respondents.

5.1.2. Source of income

The source of income depends on occupational category of the respondents. It is an indicator of livelihood and welfare of the household. In the study area, the company employs a massive work force of around 20000 permenant and seasonal employees. So most of the respondents have the chance to be engaged in more than one job for earning additional income and this has brought prosperity not only to those local people working for Company but also to the district as a whole. From Table (5.2) the sources of income depend mainly on company posts. Also there are some other activities which support income. From this table it is clear that (79%) of the respondents rely on company posts as a major source of income. Since the income of local people depends largely

on the salary, but since it is not enough to meet their daily requirements and fulfill their ambition, some of them rely on farming cash crops (rainfed crop farming) to support their income as indicated by (16%) of the respondents.

However, animal rearing could be considered as an integrated activity to agricultural activity in the study area, where the sugar cane and the agricultural residues provide the fodder to the livestock during the periods of fodder scarcity. Animal rearing as a village-based activity or through nomadic system to support the income of the respondents is practiced only in village 5 and village 1 as indicated by (2%) of the respondents. Here comes the role of the extension programs to encourage the farmers to be involved in such activities for self satisfaction under controlled grazing system.

Table (5.2): Source of income of the respondents in the study area

Village	N	Source of income			
		Farming	**Animal rearing**	**Company post**	**other**
Village 6	25	1	-	23	1
Village 5	25	5	1	18	1
Village 4	25	7	-	18	-
Village 1	25	3	1	20	1
Total	100	16	2	79	3

Some respondents (3%) showed that they practice some other activities for sake of income generation. These activities are fishing, trading and nursery activities. As appeared from the above-mentioned table non of the respondents rely on forests products for income generation. This could be attributed to the high ecological awareness of the local inhabitants or to the restricted enforcement of the forest laws and legislation or scarcity of forests in fields other than the company plantation. Moreover, the poor natural vegetation in

the study area may be behind the lack of reliance on forests products for income generation.

5.2. Agricultural activity in the study area

In the study area, the area of agricultural land varies between (1 - 25) feddans. The agricultural activity is practiced in two forms of land tenure, namely; domestic and company land (Table (5.3)). From this table it is clear that the majority of the respondents are engaged in the company land type as stated by 97% of the respondents. The logic of this type of land tenure is attributed to the fact that one of the strategies of the company is to settle the local people of the study area who are known with their nomadic style of life. A vital method to attain this objective is through allocation of agricultural lands. Agricultural activity in domestic land in the study area is practiced by 39% of the respondents; the majority of them are from village (4) and village (1). From this result it is clear that some respondents have both types of land tenure.

Table (5.3): Size and type of agricultural land ownership in the study area

Village	N	Type of ownership		Area of agric. Land		
		Traditional land	Company land	1-12	13-25	>25
Village 6	25	4	25	3	1	-
Village 5	25	8	22	5	-	3
Village 4	25	12	25	7	3	2
Village 1	25	15	25	7	4	4
Total	100	39	97	22	8	9

As far as the area of agricultural land is concerned, the company allots a fixed area for all the respondents. In order to avoid conflicts on land ownership the company re-allots the agricultural land to the inhabitants every now and then.

For the traditional (Domestic land) ownership, the area of the agricultural land varies considerably. The majority of the respondents who possess such type of ownership have agricultural land with an area of 1-12 feddan (22%) and only 9% have agricultural land of more than 25 feddans.

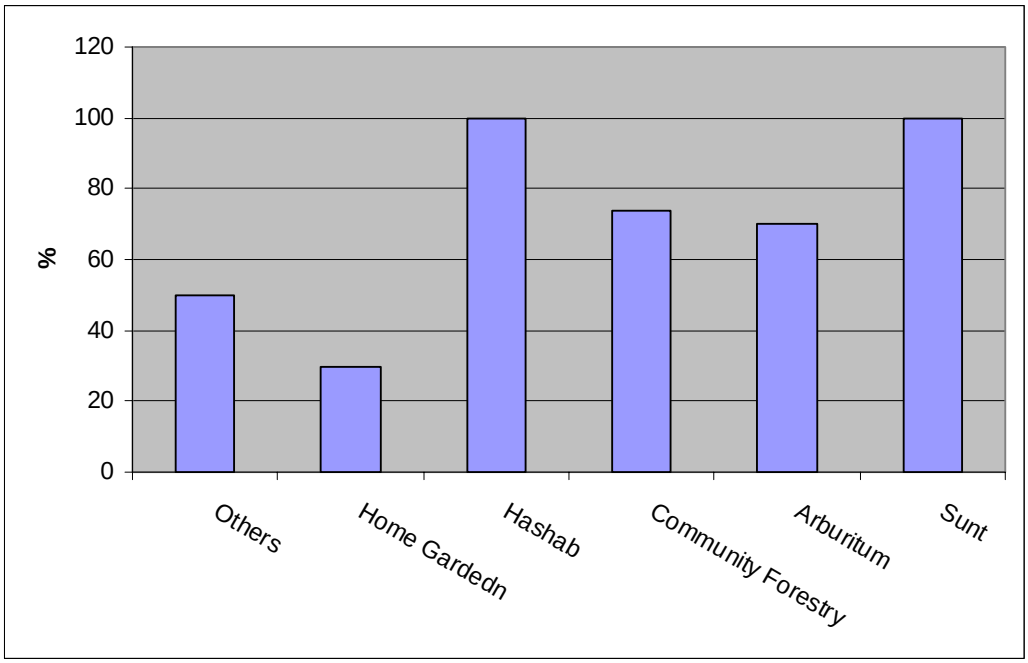
5.3. Activities undertaken by the company for the local peoples' welfare

Kennana Sugar Company adopted and organized different activities for the sake of welfare of the local people beside restoration and rehabilitation of the study area. Figure (5.1.) shows the activities undertaken by K.S.C in the study area. Expansion in Sunt and Hashab plantions is the main activity in the field of forestry as indicated almost by all the company staff. This clearly illustrates the ability of the project to address the environmental impacts of the company beside rehabilitation of the study area by species native to the site. Although the growth rate of Hashab trees in the study area is promising and satisfactorily, efforts for tapping it for gum production is not encouraging. This phenomena received considerable attention from the company and a series of workshops were organized to tackle this problem (Ahmed, 2000).

Community forestry also receives considerable attention in the company as stated by 74% of the staff members. The philosophy of adopting this type of activity is to involve the local people in the process of rehabilitation of the natural recourses and provision of necessary forests products. The company also adopted the activity of homestead plantations (home gardens) in the form of agroforestry in which trees and agricultural crops are cultivated in the house yard as indicated by 30 % of the staff members. The idea of the activities of community forestry and home garden were thought about as a means to draw the attention of the local inhabitants from the company plantations. Establishment of an arboretum activity which includes more than 56 tree species was mentioned by 70% of the respondents as one of the activities run by the company. The arboretum serves academic purposes and consists of

native and exotic trees. Half of the staff members (50%) mentioned other forms of activities undertaken by the company represented in organizating grazing in the company plantations, agroforestry and nursery.

Fig. (5.1): Activities undertaken by KSC



5.4. Selection of tree species for the community forestry in the study area

There is already adequate knowledge (indigenous and scientific) about tree species and their growth patterns in many different agroclimatic regions. Farmers do grow trees, but most species grown by them as yet, take a long time to mature. It is important to determine if they will accept new, fast growing species (FAO, 1985). Investigation on the dominant tree species in the study area revealed that Kafur (*Eucalyptus spp*) are the dominant species particularly in the company plantations as asserted by 77% of the respondents (Table 5.4). While the other tree species were mentioned by 23% of the respondents. Different factors are behind the selection of the tree species in the company activity. The majority of the respondents (59%) stated that the company is the responsible side for the selection of the tree species in the system. This may be logic if we know the forestry background of the staff in the forestry department

which qualifies them to select tree species according to ecological matching besides other desirable characters. This attitude contradicts with the slogans of rural and community development which call for giving the local people the chance to select the desired trees that meets their needs.

Table (5.4): Selection of tree species for the community forestry

Village	N	Trees types		Selection criteria			
		Kafur	Others	Company	More profitable	Environmental	Others
Village 6	25	18	7	21	-	-	4
Village 5	25	16	9	7	1	8	9
Village 4	25	22	3	14	3	3	4
Village 1	25	21	4	17	2	-	6
Total	100	77	23	59	6	11	23

Some respondents (6%) showed that they select the tree species that provides profitable return after harvest, while 11% showed that their selection focuses on tree species that provides better environmental protection (mainly against dust storms and wind erosion). Some respondents (23%) mentioned other different factors like fast growth, market demand and aesthetic value of the trees.

5.5. Perceptions towards existence of trees in the agricultural land

The basic reason for the accelerating pace of forest depletion is the ever increasing pressure on the world's finite resources. The farmers must have land to grow the food they need to survive and retain or cultivate tree species for their needs (FAO, 1993).

From Table (5.5), 27% of the respondents in the study area are accepting existence of trees in their farms in the forms of windbreak, shelterbelts or in

agroforestry combination, while (12%) of respondents stated that they are already adopting tree components in their farms and they are looking forward to expand the stocking density of the trees in their farm land. The company staff in forestry department can use the approach of ideal farmer through field days to recruit new comers in the field of agroforestry through exposing them to those farmers. The rest of the respondents (61%) are either against the idea of introduction of the tree component in their farms or against the idea of increasing the stocking density of the trees.

Table (5.5): Perceptions towards existence of tree species in the agricultural land

Village	N	Accept trees in farm	Require more trees	Reasons for not introducing more trees			
				Small area	Difficulty of irrigation	Compete with crops	Regulations of the company
Village 6	25	11	2	7	1	7	1
Village 5	25	4	2	3	4	3	1
Village 4	25	3	1	7	7	4	2
Village 1	25	9	7	7	2	4	1
Total	100	27	12	24	14	18	4

Different reasons are confronting introduction of trees in the farms or increasing the stocking density of the trees as stated by the respondents in the study area. The majority of this group (24%) stated that they have no vacant lot for trees due to their small farm area. Competition with agricultural crops for light and water was mentioned by 18% of the respondents, while 14% pinpointed difficulty of irrigation is the main reason behind their refusal to introduce trees in their farms. Some respondents 4% showed that they are following the regulation of the company which highly restricts the introduction of the tree component in the agricultural land. Bearing in mind that the company is aware of the environmental dimension according to the environmental impacts of the company, accordingly, the company established a

shelterbelt which is of a profound impact on the area by reversing deforestation as well as generating income for the company and improving the income level for the local people.

5.6. Objectives of community forestry in the study area

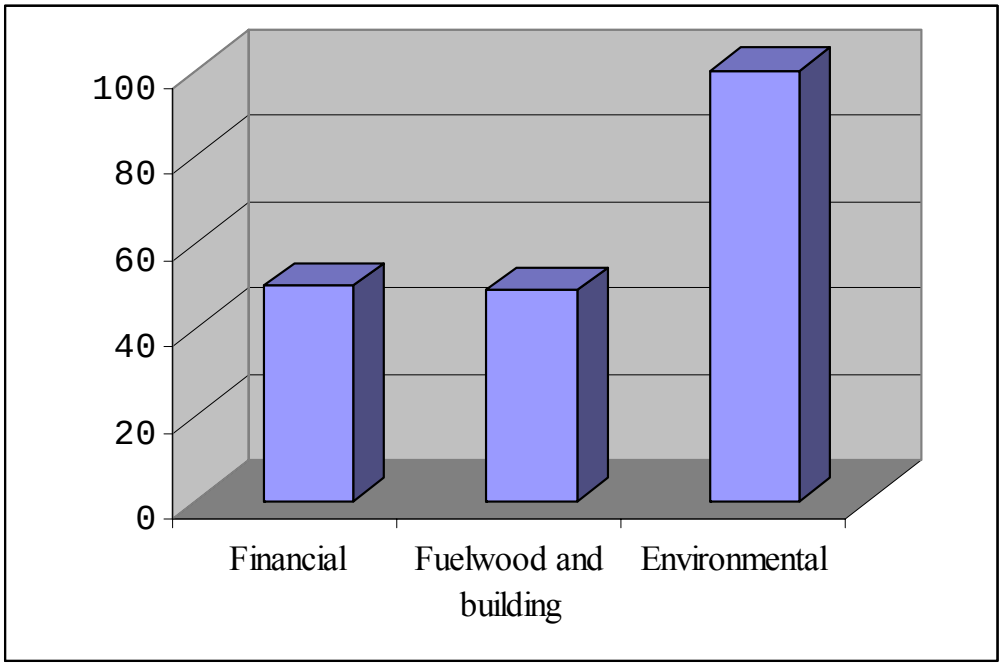
People in developing and under developing countries need forest and forest products, where fuelwood acounts for over eighty percent of the wood consumed for energy (Cernea, 1985). The obvious objectives of community forestry in the respondents' opinion in the study area are displayed in Table (5.6). The broad objective of the community forestry in the study area is financial and environmental as viewed by the respondents in the study area. The majority of the respondents (34%) specified the broad objective of the community forestry as income generation (financial), while 29% and 29% of the respondents believed that community forestry objectives are both social and environmental respectively. These results show the degree of awareness of the local people is high in the study area. Few respondents (8%) mentioned other objectives behind the establishment of the community forestry. These objectives are provision of grazing land, aesthetic and tourism as well as a dwelling place. In order to sustain the objectives it is necessary to help the local inhabitants to understand the negative relationship between man and nature to facilitate their participation in meeting their basic needs (Astorga *et al.* 1992).

Table (5.6): Objectives of community forestry in the study area

Village	N	Financial	Social	Environmental	Others
Village 6	25	8	8	8	1
Village 5	25	9	8	8	1
Village 4	25	8	6	6	4
Village 1	25	9	7	7	2
Total	100	34	29	29	8

The staff of the inistitutional forest asserted the objectives behind the establishment of the activity of community forestry as displayed in Fig. (5.2).

Fig: (5.2). Objectives of institutional forests (KSC)



All the staff members showed that the main objective of the community forestry is environmental beside provision of fuelwood and building materials to the local people. The environmental dimensions of the institution

plantations and community forestry is to break the desiccating winds during dry seasons, reduce temperatures, maintaining the relative humidity, serve amenity purposes, and avail grazing area for domestic animal. Bear in mind it is one of the conditions proposed by the African Development Bank to assign an area of 6000 feddan for trees plantation. It is acknowledged that at the same time growth is often accompanied by increasing stress on natural systems and significant adverse effects on environmental quality. The central issue, then, is to conduct development activities in a fashion that preserves the long-run productivity of natural systems for sustained development and that minimizes deterioration in environmental quality. It is worth mentioning that the financial benefits of the institutional forests which the staff members specify them as: utilize the drainage water, utilize land not suitable for cane growing, employ the permanent labors in the field of forestry for other machinery maintenance activities.

5.7. Management of community forests

The ideal resource management system should combine the strength of both community controlled and bureaucratically controlled system, integrating responsive local decision units into a larger system able to distribute risk and development costs while mediating conflict among individual local units. The community forests activity proposed three essential goals for development: sustainable productivity; equity in the distribution of benefits and burdens of productivity; and a sense of cultural and ecological continuity (Burch and Grove, 1993). Those aims can be achieved through effective management. Table (5.7), shows the views of the respondents with respect to the management of the community forests in the study area. The majority of the respondents (97%) stated that the management of the community forests is conducted by the administration of the company, while 3% only mentioned that the local people do this task. The results of table (5.7) verified that the respondents are confident in the institutional management rather than local people. This reflects the importance of establishment of a separate extension

unit within the forests department in the company to convence the local people to establish and manage their own forests. Moreover, the establishment of this unit will reveal many ambiguities associated with the establishment of these forests. It should be acknowledged that the local communities should be able to determine their needs, its capacities, and ultimately it's own control over both its resources and its destiny. Moreover, recognition of the management decisions made by diverse communities need to be merged into the institutional forests perspective. Fox (1990) showed that forestry departments can serve a useful role as investigators and supporters of community-managed project. Social foresters seeking to implement community participation programs on public lands must search for a middle way through the contradictions implied in a bottom-up land management strategy being implemented by a top-down management agency.

Table (5.7): Management of community forestry in the study area

Village	N	Area of community forests			Management of community forests	
		1-6	7-12	>12	Administration of the company	Local people
Village 6	25	17	-	5	25	-
Village 5	25	16	9	-	25	-
Village 4	25	20	1	1	25	-
Village 1	25	22	3	-	22	3
Total	100	75	13	6	97	3

Bearing in mind the areas of the majority of the community forests in the company site is less than 12 feddans as stated be 88% of the respondents and 75% of this group showed it is less than six feddans. Such small area doesn't need much managerial efforts therefore, the local people through the local institutions or the village community could easily run the activity if they

receive the necessary technical knowledge regarding the management of the forests.

5.8. Community development

The deforestation and destruction of the vegetation cover, in recent decades to feed growing population could have devastating social, environmental and economic consequences. Community forestry is playing a variety of complex roles in the development process. Table (5.8) explores the contribution of community forests to rural and community development as viewed by the respondents. The majority of the respondents (82%) stated that community forests provides community services. These services are: transportation, education, health, water and others, as stated by (9%), (26%), (3%), (6%) and (22%) of the respondents, respectively. The services improved indirectly through the revenues of thinning from trees of community forestry and the final harvest. Although the returns from selling woods are very continuous but at long intervals, they contributed effectively in rural development in the study area. This shows the importance of launching community forestry services through institutions for rural and community development.

Table (5.8): Community development

Village	N	Provision of services	Types of services				
			Transportation	Education	Health	Water	Others
Village 6	25	19	2	2	2	6	6
Village 5	25	19	1	3	-	-	4
Village 4	25	23	2	14	1	-	1
Village 1	25	21	4	7	-	-	11
Total	100	82	9	26	3	6	22

5.9. Methods of recruitments of participants to the program of community forestry

Forestry programs are subjected to failure if planned without the interpretation of the local people for their needs, aspiration and problems, therefore in community forestry which is known as forestry for people, it is important to involve the local people (Clayton, 1985) Involvement of participants in the process of community forestry will contribute to the development through either environment protection or gaining additional incomes. As it appears from Table (5.9), the administration instructions were the main method attracting local people to participate in community programs with a percentage of (97%) according to the respondents' point of view. This method deprives the concept of participatory approach from its meaning. There must be a commitment and genuine participation through voluntary involvement in the activity. This agrees with Davis-case (1989) who stated that "generally, participation is the voluntary involvement of people in self-determined change", and Mang'ala (1991) defined participation as the voluntary involvement of the people in the development of their own lives and environment. The rest of the respondents (3%) stated different reasons behind their involvement in the activity. Some respondents (2%) mentioned financial and environmental reasons are behind participations in these programs. While 1% stated that protection from wind is behind the participation in the program. These percentages show that local people perceptions to the environmental and economical issues are very weak. This necessitates the importance of establishment of a separate extension unit for raising the ecological awareness.

Table (5.9): Reasons of local people participations in the community forestry program

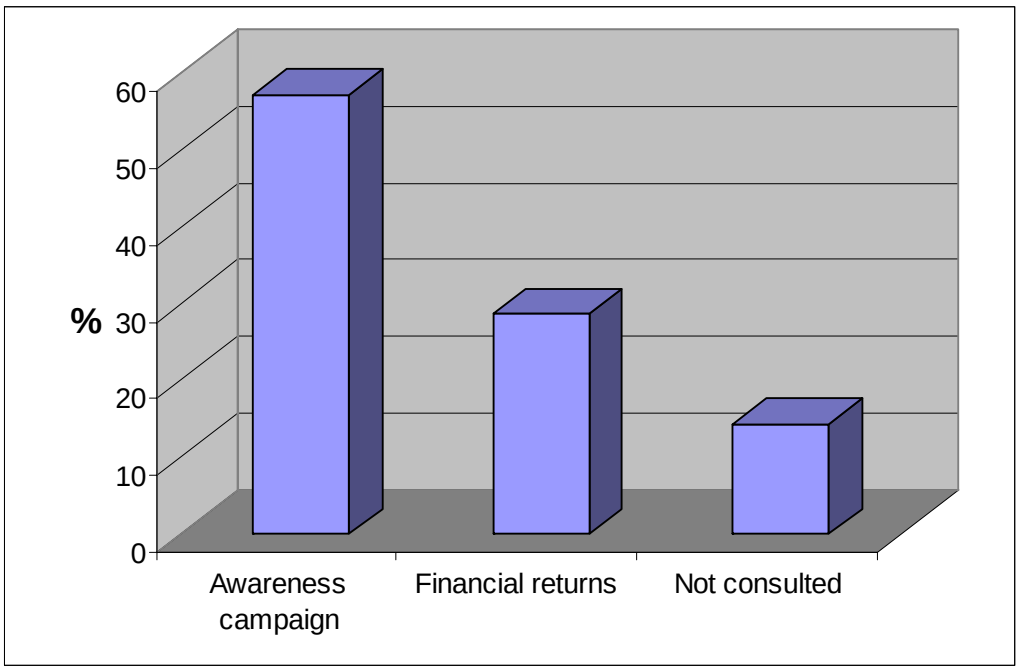
Village	N	Convincing people to participate		
		Instruction from the administration	**Protection against wind**	**Financial and environmental reasons**
Village 6	25	24	-	1
Village 5	25	25	-	-
Village 4	25	23	1	1
Village 1	25	25	-	-
Total	100	97	1	2

To develop the forestry activities in the study area, local people have to participate effectively from the point of planning to the phase of execution.

Fig. (5.3) shows the different methods used by the company foresters to recruit the local inhabitants in the afforestation activities. More than half of the forestry staff (54%) stated that the company administration attracted and encouraged local people to participate in community forestry activities through awareness campaign. From these findings it is clear that there is a contradiction between the statements of the local people and the forestry staff of the company regarding the method of recruitment. This might be due to the fact that the extension work is carried out by the same foresters who used to issue instructions and orders to the local people. Therefore, the awareness campaign is considered as instructions rather than extension services. This idea is supported by FAO (1986) which showed that the extension staff should be free from regulatory duties. Moreover, the enforcement duties should be

allocated to other staff to encourage the people to adopt a more positive and cooperative attitude towards the extension staff.

Fig. (5.3): Methods implied by the KSC to enhance participation



Prospects of financial returns slogan was used as a method for recruiting the local people as stated by 25% of the staff members under the assumption that the local people involve of in the activity that improve their living standards directly or indirectly. The absence of a separate extension unit is clear where about 10% of the staff members stated that they have not consulted the local people to join the project activities.

5.10. Participants perceptions towards the benefits of community forestry activities

Social forestry programs are based on community participation in the design and implementation of land management plans. These programs seek to help farmers identify their demands for various social forestry products, develop

sustainable plan for achieving self-sufficiency in these products, determine how to distribute products, among themselves, and reduce abuses on government forest lands. Social forestry programs thus require an understanding of the people, their needs and aspirations, and their capabilities (Fox *et al*. 1990). A good proportion of the respondents (70%) participated in the community forestry activities in the study area (Table (5.10). The reasons for participations as viewed by the respondents were instructions (29%), financial and social benefits (18%), community developments (14%) and social benefits (9%). Amazingly, none of the respondents mentioned the environmental importance of the community forestry and focused on the social and financial benefits.

Table (5.10): Participants' perceptions towards the benefits of community forestry activities

Village	N	Involvement in activities	Reasons of participation			
			Instruction	Financial and social benefits	Community development	Social benefits only
Village 6	25	15	5	6	2	4
Village 5	25	17	13	-	2	-
Village 4	25	20	2	3	9	3
Village 1	25	18	9	9	1	2
Total	100	70	29	18	14	9

5.11. Sustainability of the activities of community forestry

Traditional forms of forest management are no longer appropriate for the non-reserved forests and indeed for many of the reserved forests as well. The need is to recognize that people always have used forest resources and always will. Foresters have to learn to work with the people rather than seeing them as threat that has to be controlled (Bristow, 1996). Sustainable development is a process of changing of investment which the exploitation of resources, the

direction of investments, the orientation of technological and institutional changes are all in harmony and enhanced both current and future potential to meet human needs and aspiration (FAO, 1993).

In the study area, the majority of the respondents (85%) asserted the possibility of sustaining the activity of community forestry for the sake of perpetuating the gained benefits. While the rest of respondents have different views regarding the possibility of sustaining the activity, where 21% of the respondents stated that contracts with the company which have control of the land and management of the activity is the main constraint confronting the sustainability of the activity. Some respondents (15%) stated that the scarcity of land force them to eradicate trees from the farm land (Table (5.11)).

Table (5.11): Perception of local people towards community forests sustainability

Village	N	Sustainability	Contracts	Short of land
Village 6	25	24	16	1
Village 5	25	25	1	-
Village 4	25	17	2	8
Village 1	25	19	2	6
Total	100	85	21	15

5.12. Local institutions indulged in community forestry activities

The 'social dimension in social forestry should be understood to signify a broader meaning than individual behavioral change alone: it includes collective action, institutional development, and the establishment of enduring social structures and value systems that activate and organize individual actors. Local people in rural-developed areas organized themselves in simple institutions, in order to solve some problems as groups. In the study area the respondents believed in the role of local institutions in different community forestry

activities. Table (5.12) illustrated that (31%) of the respondents prefer existence of local institutions to administer the different activities concerning the community as a whole. Although the percentage of the respondents who prefer the existence of local institution is low, still it is a good sign. One effect of changes that have taken place in rural areas in recent years has been the growth of organized groups. Such groups have arisen from a number of sources such as political parties, economic activities, local government or family based relationships to broader groups based on common interests (FAO, 1986). Men group is suggested by 26% of the respondents, while mixed group of women and men is suggested by 2% of the respondents. Women group was suggested by 2%, this clearly reflects the role of taboos and traditions concerning women involvement in communal activities.

Women are active users of forest resources throughout the western and northern regions of Sudan through their specific activities differ according to local tradition, climate and system of land tenure there have been many forestry related programs in this area of the country since the period of server drought during the mid –1980. Women's participation as forestry programs is at present strongest in the field of extension (COWIconsult, 1990). Only (1%) of the respondents considered the youth group. These results demonstrated that the management of community forestry activities through local institutions is lacking and it must be encouraged the societies because of their indigenous knowledge. Youth group which has considerable role to play must be included in community forestry activity. However all groups have to pay special attention and orientation towards other promising local institutions.

Cernea, (1992) emphasized collective actions have the highest chance to occur and effective when people belong to organized groups, are informed and consciously perceive that, it is in their best interests to act purposively in a coordinated manner. Performance of these groups will also improve when the group has developed leadership structure and internal norms and procedures

capable of organizing and managing its members and to overcome conflicts and deviant behavior.

Table (5.12): Local institutions involved in community forestry activities

Village	N	preference of local organizations	Types of local organizations			
			Women group	Youth group	Men group	Mixed group
Village 6	25	9	1	-	8	-
Village 5	25	4	-	-	44	-
Village 4	25	14	-	-	13	1
Village 1	25	4	1	1	1	1
Total	100	31	2	1	26	2

5.13. Meetings and coordination

Forestry extension is a tool for encouraging peoples' participation, and it is considered as an agent of change in the villages. There are several interesting extension methods designed to generate two-ways flows of information. Conducting meetings is an effective way for dissemination of information to local people in illiterate areas. As far as public meetings are concerned, Table (5.13) furnishes the results of the respondents views. All the respondents showed that there are no public meetings or lectures or seminars provided by the company, and the majority of the respondents (54%) suggested that public meetings with the company staff will consolidate the relationship between the two parties and automatically enhance the activity of community forestry. This agrees with Tapp (1984) who mentioned that many of community forestry projects in Sudan had no extension system and would often not inform the local population of activities being conducted on their land. Some respondents 9% suggested that the meetings should be held with the forest ranger rather than

the company officials to escape the burgcracy of the officials and find freedom to explore their ideas, and (4%) of the respondents appreciated the role of the village committee and proposed it as the body that should be responsible for running the public meetings.

Table (5.13): Meetings and coordination

Village	N	Chairman	No meetings	Forest ranger	Committee	Others
Village 6	25	14	3	2	-	4
Village 5	25	15	1	6	3	-
Village 4	25	13	5	-	1	1
Village 1	25	16	2	1	-	-
Total	100	54	11	9	4	5

A wide range of techniques and inputs, with good village participation, can enable real environmental and economic improvements to be made through the joint efforts of foresters and the people (Bristow, 1996).

5.14. Coordination between participants and related sectors in the study area

The community forestry management process required high coordination between participants and related sectors. In the field of rural development and community forestry there are many types of relations to ensure this coordination. Power relationship is one of the important aspects of participation. Davis-Case (1990) explored the relation in the existence of two parties involved in any development works; the 'insiders' or the target group(s) of the local people and 'outsiders' like implementers or donors. This implies a situation of a win/lose force, which creates two types of power; either power within (share) or power over and no power. The latter is the most common power relationship in development work.

From Table (5.14), more than half of the respondents in the study area showed that they have relationship with the company and FNC in equity as stated by 31% for each. This low percentage reflects the weakness of the related sectors to make a high coordination with the participants especially in the communities dominated by reasonable educational level. FAO (1986) put special emphasis on the cooperation with other land development agencies. Forestry extension programs cannot proceed without due regard to other rural development programs and the local communities in the area.

Table (5.14): Coordination between participants and related sectors

Village	N	Relationship with		Types of relations			
		KSC	FNC	Supervision	Planting and protection	Marketing	Other
Village 6	25	14	15	5	2	3	4
Village 5	25	2	11	1	2	-	-
Village 4	25	9	2	1	-	2	6
Village 1	25	6	3	4	1	-	1
Total	100	31	31	11	5	5	10

The different types of relationship in the study area are; supervision of the different activities concerning the community forestry as stated by 11% of the respondents, protection (5%), and marketing of timber (5%). Some of the respondents (10%) showed that they had other relations**.**

5.15. Villages committees and assistance provided by the company

All the NGOs insist and focus on the formulation of Village Development Committees (VDC) as one of the major components of the projects. The group selected for the village committee is supposed to perform certain tasks

formulated by NGOs and known as responsibilities of contact groups. The majority of the respondents (98%) in the study area showed that the village committee was not selected through elections and they were appointed by the company (Table 5.15). This attitude contradicts with the general principles for the selection of the village committees for mobilizing the local people for rural development. The elected committee through voting or general consensus would have general acceptability by the communities and consequently the level of coordination between the local people and elected village committee could be guarnteed.

Table (5.15): Village committees and assistants provided by the company

Village	**N**	**Selection of the village committee**	
		Elected	**Appointed**
Village 6	25	-	25
Village 5	25	-	25
Village 4	25	2	22
Village 1	25	-	25
Total	100	2	98

5.16. Incentives and subsidies provided by the company

It is not enough when the local people can repeat perfectly what they have learned to do even in the presence of the connected knowledge. It is just the start, this stage has to be followed by motivations or incentives to make the local people keen to take actions related to already specified goals. The comapany provided some assistance to the respondents like provision of seedlings as stated by 98% of the respondents. From this result it is important to notice that the company offer the seedlings free of charge but do not introduce extension regarding tree planting nor provide supervision regarding cultivation of seedlings. All the respondents showed that the company made

the land preparation (plouging, ridging and furrowing) besides irrigation during the agricultural season. These high percentages of assistants could be interpreted by the attentive economical policies of the company towards the success of these plantations (Table 5.16).

Table (5.16): Incentives and subsidies provided by the company

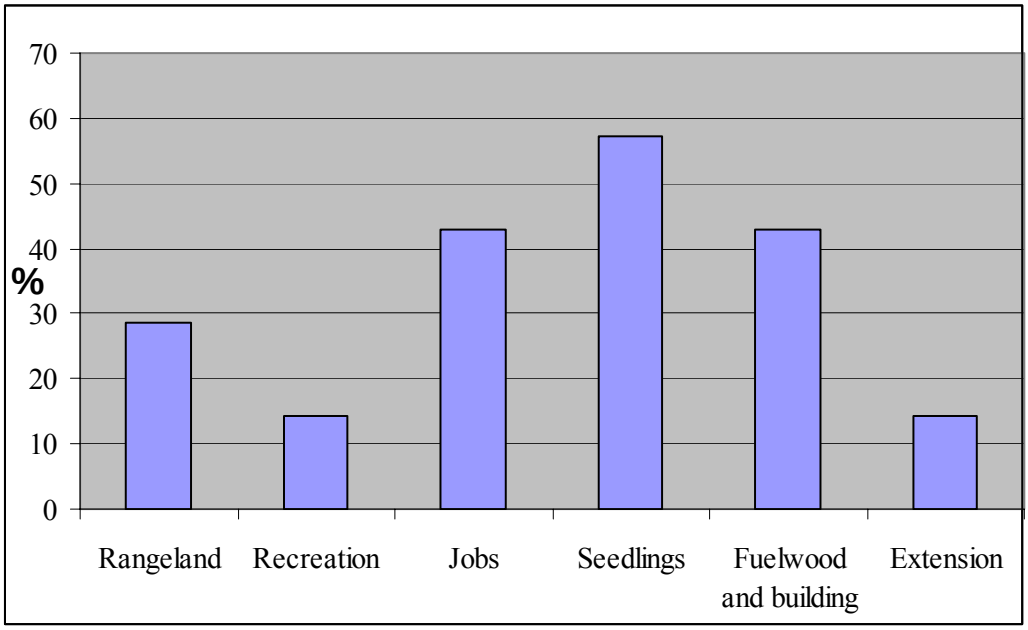
Village	N	Project assistants	
		Provision of seedlings	**Ploughing and irrigation**
Village 6	25	25	25
Village 5	25	25	25
Village 4	25	25	25
Village 1	25	23	25
Total	100	98	100

Fig. (5.4) illustrates the assistance which KSC offered to the local people in the study area as stated by the company officials. Provision of seedlings represented more than half percentage (57.2%). This encourages local people to participate in community forestry activity in its different forms. Unfortunately the distribution of seedlings is not linked with a clear agreed-upon strategy for afforestation.

The company could utilize the keenness of the participants to possess seedlings in activities on an individual basis (windbreaks, farm forestry or agroforestry) or on group basis (expansion of the area of community forestry or woodlots). Provision of fuelwood and building materials from the company plantation is considered by 42.9% of the staff member as incentives for the local people. The same percentage of the staff considers the provision of job opportunities is

a subsidy to the local people. This percentage contributes partially to solving the problem of idleness. Rangeland as incentive represents the view of 28.6 % of the staff members, while aesthetic value and recreation represent the views of 14.3 % of the staff member. The extension services executed by the KSC in the study area mentioned by 14.3% of the represented. By reviewing the adminstrative level of the institutional forest in KSC (Appendix3), there is no specialized unit devoted for extension work. This fact shows the complete absence of extension unit, and this can be considered as one of the pitfalls of the forestry sector. It is important to notice that incentives and motivations, as a tool for involving local people in commitment participation is not the same for the whole community members (Kurk, 1983).

Fig. (5.4): Assistance offered to local people by KSC



Fortmann and Rocheleau, 1985 suggested that when considering incentives and motivations, all the possible motivations of the different sub-groups making up the community have to be studied carefully before the identification of the systems that will give rise to satisfaction and prosperity within the community.

5.17. Extension services provided to participants of community forestry

The main task of extension services is to disseminate simple information through local people in order to improve their attitude towards environmental and development problems. Unfortunately there is no existence of an extension unit, although there is a promising forestry activity. The technical staff of the forestry department in the company contacted the local people directly to deliver the extension messages. Bear in mind the background of most of the early foresters is deprived from extension knowledge (techniques, methods and philosophy) and they conduct extension service as a part of their routine work.

From Table (5.17), 33% of the respondents stated that the main message they had received dealt with monitoring of the plantation. Some respondents (14%) showed that the company staff are keen to disseminate information regarding irrigation intervals for sake of economical use of water. A similar percentage of respondents showed that the staff members are considering the trees spacing & weeding operations, and 13% of the respondents mentioned that they received information regarding the conservation of the natural resources in the study area.

Table (5.17): Extension services provided to the participants of community forestry activities

Village	N	Extension message				
		Irrigation	Conser-vation	Monitoring	Spacing & weeding	Other
Village 6	25	7	1	1	4	12
Village 5	25	1	10	18	1	6
Village 4	25	3	1	12	3	7
Village 1	25	3	1	2	6	8
Total	100	14	13	33	14	33

The most effective pattern of forestry extension requires a functional approach. That means the designers must, with the cooperation of the people concerned, define certain goals which are of importance to the people and decide on the steps that must be taken to achieve these goals. The goals themselves must be clearly defined if the process of achieving them is to operate effectively (FAO, 1985).

5.18. Intervals of extensions' visits

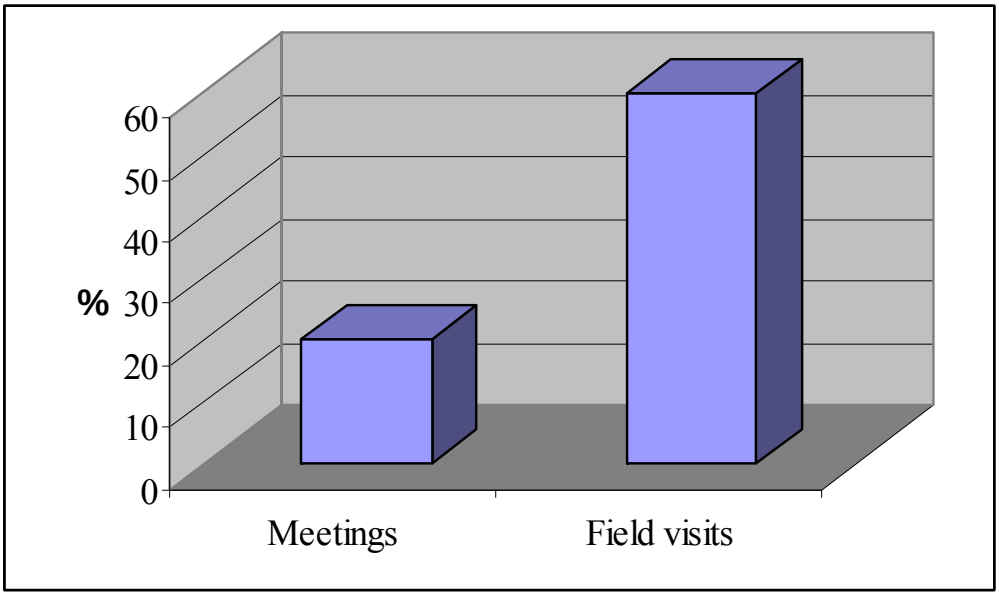
Home visit is one of the basic methods of working with people. Table (5.18), displays the level of communication between the company staff and the local people. This table shows that only 20% of the respondents stated that the extensionists' visits are scheduled to cover the whole year, while 20% emphasized the lack of these visits except during the period of tree planting, and 21% asserted that the company staff visits are sporadic and limited. The rest of the respondents (7%) showed that the company staff visits are at the season of harvest. To ensure the sustainability of the community forestry, systematic extensions visits must be organized with suitable intervals to give participants the doses which they need. This agrees with FAO (1986) which stated that home or small group visits by extension staff may be casual or rigidly scheduled, but they will remain a basic method for most routine extension work.

Table (5.18): Intervals of extensions' visits

Village	N	Only during planting	All the year	At harvest	Others
Village 6	25	3	14	1	7
Village 5	25	7	5	2	7
Village 4	25	7	4	-	3
Village 1	25	3	-	4	4
Total	100	20	23	7	21

The main methods used by the company staff for dissemination of information are field visits and group meetings (Fig. 5.5) as stated by the staff members of the company. Field visits are confirmed by 60% of the staff as the main method for dissemination of information while the meeting method is mentioned by 20% as a means for dissemination of information.

Fig. (5.5): Extension methods used by KSC



From this result it is clear that the company relies on field visits rather than on meetings for the dissemination of information. Regular meeting on a known schedule for all of the local people in any village would tighten the relationship between the local people and the forestry sector. On the other hand long interval meetings would lead to ignorance and reluctance among household. To compensate for this, village committee is an essential component in the administration structure. The role of the village committee is to build abridge between the local people and the institution to disseminate the invitation for meetings attendance, which is an important factor to success extension programs.

5.19. Constraints to participation of local people in community forestry activities

Community support through participation is a central concern of all social forestry projects, for without local participation, sustainable resources management cannot be assured. Table (5.19) furnishes the main constraints and measure of risks confronting the participation of the local people. A considerable proportion of the respondents (30%) showed that they have not participated in the activity of community forestry. It expected that the whole community members participate in this activity since the reward from the activity return to the whole community in the form of services.

Table (5.19): Factors confronting participation of local people in community forestry activities

Village	N	Not participated in community forestry	Reasons against participation		
			Not assigned for the task	Not available	Not given the chance
Village 6	25	10	6	-	2
Village 5	25	8	9	1	1
Village 4	25	5	2	4	1
Village 1	25	7	1	2	1
Total	100	30	18	7	5

Different reasons are behind the lack of participation of the whole community members as stated by those respondents who had not the chance to participate in the activity. Some respondents (18%) clarified their lack of participation

because they were not assigned by KSC for this activity. This could be considered as one of the pitfalls of the company because the participation in the community forestry is not on voluntary basis. In broadest sense participation of local people implies voluntary involvement of local people, the entire community or freely elected representatives in the project investigation, planning, implementation and maintenance (Mang'ala, 1991). Moreover, 7% of the respondents attributed their lack of participation to the fact that they were not asked to join the team who are running the activity of community forestry. This attitude also contradicts with the concept of participatory approach which calls for the involvement of the whole community members irrespective of gender or age. Amazingly, 5% of the respondents stated that they showed their interest to participate in the activity but they were not given the chance. This reflected weakness of the company role in encouraging full participation in rural development, in addition to the absence of extensions. Chavngi (1991) defined participation as having a role to play in some activities. Participation in the narrowest sense means employment of local people as wage labor.

Sustainable community forestry development requires understanding and solving all problems associated with the management of common property forest resources as well as planning technology or knowledge of forest ecolgy (Falconer, 1987).

5.20. Marketing of the products of community forestry

The market value of the community forestry products in the study area is influenced by the cost of different silivicultural operations (seedling, weeding, thinning …etc,) beside the cost of protection and other opportunity cost. The cost of irrigation could not be added to the production cost, because irrigation is made through excess water (waste water) from sugar cane plantations. Moreover, the cost of labors is difficult to estimate because the local people

participate voluntarily in the different activities. For all these reasons it is very complicated to assess the profitability of the community forestry in the study area.

Table (5.20): Marketing of the products of community forestry

Village	N	Company	Brokers	Traders	Bids	Others
Village 6	25	5	6	-	3	11
Village 5	25	6	10	4	3	2
Village 4	25	18	-	2	1	4
Village 1	25	11	5	6	2	1
Total	100	40	21	12	9	18

As far as marketing of community forests products is concerned, several channels are used for marketing the products of community forestry (Table (5. 20)). The majority of the respondents (40%) stated that the company is the body responsible for marketing of the products. This could be as an incentive provided by the company although none of the respondents (company staff and the target group) have mentioned this incentive. The verification for this channel is the fact the company is aware by the market prices of the forest products since it subsidies the local markets with the products of the plantation of the company. While 21% of the respondents showed that the brokers and peddlers are the responsible body for marketing of the forest products. The preference of this channel might be favored in times the final felling of the community forests is not coinciding with the harvest of the company product. Some respondents (12%) referred that the products are marketed by traders of the villagers while 9% of the respondents clarified that the products are marketed through bids. The last group of the respondents (18%) appreciated that there are other channels for marketing the products of community forestry.

In the beginning, company policy was to cut, clean and classified woods, sell part of the products and store the rest. To reduce storage cost and other side effects, they started selling the products as standing trees. Statistical data from company annual reports reflects very high rate of income from institutional and community forestry wood products. Average cost/feddan of forestry plantations in (9^{th}) age of trees amount is (83.867) Sudanese dinars (S.D), while the revenues per fedan for the same age is 160.000 S.D. i.e. the annual profit of one fedan of wood products is 76.133 S. D (Appendix 4).

5.21. Prospects of other institutions in the study area

The local groups were asked about the possibility of hosting other company or industry in the study area. The responses of the target group are displayed in Table (5.21). It seems that the target groups are satisfied with the work done by KSC, Accordingly, 93% of the respondents hope for hosting other institutions similar to the KSC. This high percentage verified by the capabilities of the company to contribute to rural development programs as well as its commitment towards environment conservations. The preference for the type of the company or industry varied among the respondents. Some respondents (31%) prefer fiber industry, while (14%) suggested saw mills. These two institutions would be suitable because of the high productivity of timber in the area. Oil and soap industry were suggested by 8% of the respondents.

The majority of the respondents (43%) showed their willingness to host any company or industry in the study area irrespective of the specialization. The result of the majority of the respondents is in favor of introduction of a new source of income generation. They may be employed in KSC, but they are looking forward to secure the future of their generations beside the provision of cheap and attainable products as the case in the KSC.

Table (5.21): Prospects of other institutions in the study area

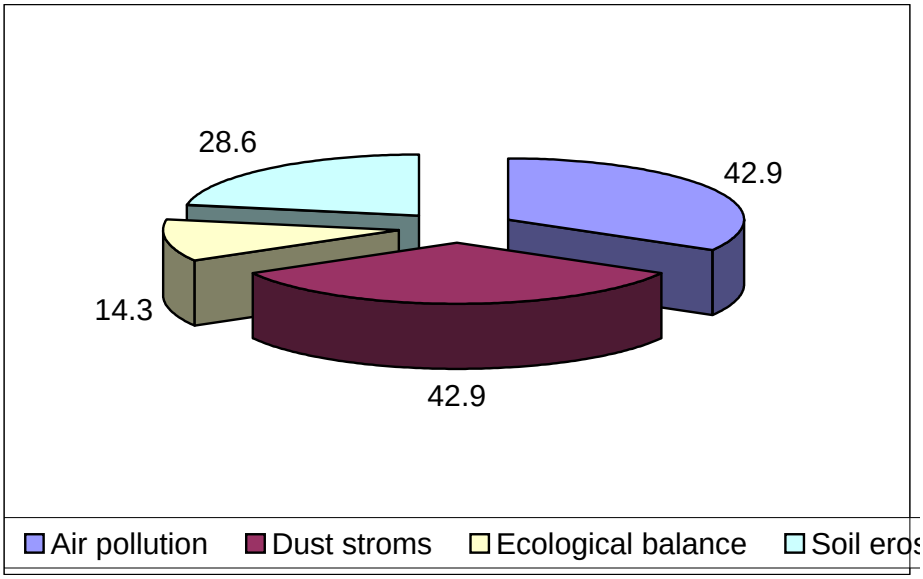
Village	N	Hopes for other institutions	Types of institutions			
			Fiber industry	sawmills	Oil and soap industry	Any industry
Village 6	25	19	8	3	-	8
Village 5	25	25	6	6	1	12
Village 4	25	24	10	4	1	9
Village 1	25	25	7	1	3	14
Total	100	93	31	14	8	43

5.22. Environmental dimension of KSC

The national energy plan (1980) reported that Sudan could stop degradation and ensure sustained supply of forestry products. This can be achieved through encouraging and developing afforestation in irrigated schemes. However, from the early seventies, to mid eighties and due to drought and cutting of trees for fuelwood, building materials, charcoal making, fodder and agricultural expansion, tree stocks have drastically decreased. When KSC started, in late seventies, land preparation to grow sugar cane removed the natural vegetation over the (160.000) fed. The institutional forests started in the year 1993-94, to compensate the vegetation removed. The KSC staff view the enviromental dimension of the company plantations in several points. The majority of the study 52.9% asserted that the plantation contribuated siginificantly to the reduction of dust storm in the study area. In conjuction with dust storm 28.6% of the respondent stated that the plantations act as barrier again soil erosion. The role of windbreaks and shilterbelts is universally acknowledaged. Moreover, the sugar cane production procceses are accompanied with air pollution from fumigation and smoke. The majority of the staff members (42.9%) asserted that the plantations play a vital role in the amelioration of the local climate through reduction of air pollusion while 14.3% of the staff a

firmed that the establishment of the company plantation resulted into ecological balance particulary after the eradication of the existed vegetation cover for the establishment of the factroy. Accordingly, the institutional forests have avital role in conservation of environment and achieve sustainability of forestry. So these great objectives can be achieved by raising the awareness of the local people and convince them to shift to alternative energy resources e.g. using gas as a fuel. The environmental role of KSC as viewed by the forestry staff of KSC is displayed in (Fig. 5.6).

Fig. (5.6): Environmental role of KSC institutional forests



5.23. Obstacles confronting the activity of community forestry

What some people call 'constraints' can also be seen as 'opportunities' by others. Several factors might contribute negatively to community forestry programs. These limitations may be associated with management of common property resources rather than tree planting technologies of forest, which are the central constraints to sustainable community forestry development. Table (5.22) shows the measure of risks confronting the community forestry activity in the study area. Fortunately, the majority of the respondents (81%)

confirmed that the community forestry activity is successful and not jeopardized by any risks or constraints. Only 19% of the respondents showed that the activity is hindered by some constraints. The majority of this group (15%) declared the shortage of land is the main problem that restrict the expansion of the activity and adoption of related activities. While 2% of the respondents referred the problem that confronting the activity is the heavy infestation of insects particularly during the agricultural season. It is clear from these findings that the problems confronting the activity are minute and controllable. The KSC can deal with these problems for the development of the activity.

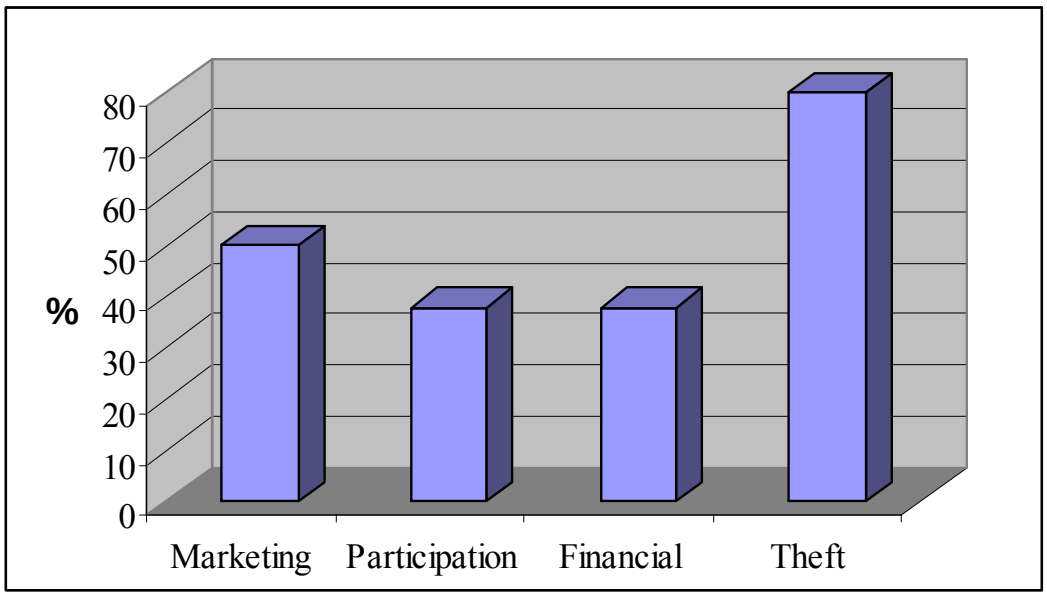
Table (5.22): Obstacles confronting the activities of community forestry

Village	**N**	**Problems**	**Types of problems**		
			Insects	**erosion**	**Short of land**
Village 6	25	2	-	1	1
Village 5	25	2	2	-	-
Village 4	25	8	-	-	8
Village 1	25	7	-	1	6
Total	100	19	2	2	15

Although the KSC established community forests to obtain wood products for the local people in the study area, the main constraint hindering the institutional forests activity is the theft of forest products as mentioned by 80% of the respondents (Fig. 3.7). The justification of this factor could be attributed to the complete absence of extension forestry program which is responsible for raising the awareness of the local people through addressing the importance of the existence of the plantations. The joint management approach which call for close coordination between the local people and the forestry department through involving the local people in the management of the plantation could be practiced to avoid this phenomena. Otherwise, the company could follow

the law of forests and natural resource of year 2002 which call for establishment of police force to protect the plantation (Ibrahim, 2003). The poor participation of the local people in the activity of the community forestry is mentioned by 40% of the staff members as a constraint confronting the sustainability of the activity. Falconer (1987) explored the major constraints to local participation in community forestry programs as; participants do not feel a pressing need for communal activities, lack of institutional security over the rights of access to tree products, a history of negative legislation with the forest services. Marketing of forest products although represent a headache for the administration of the company as mentioned by 46% of the respondents. The cost of harvesting trees, classification, transportation, handling and storing is very high, accordingly, the company is obliged to sell wood products immediately after harvest to brokers, traders or bids. Despite the high financial returns from forest products, 40% of the staff members mentioned that the company does not offer the required finance for running the different operations.

Fig. 5.7: Constraints confronting institutional forests



CHAPTER VI

Conclusions and Recommendations

6.1. Conclusions

- The population density in the study area is high and this exerts pressure on natural resources which reflected in the theft of forest products for building requirements and energy from the plantations of the company.
- The educational level of the target group is good where there is no illiteracy due to the infrastructure offered by the company in this field. This situation is in favor for extension service where the literates are capable to read and write and automatically capable to follow instruction and interpret symbols and drawings.
- The major source of income of community members is posts in the company. This clearly reflects the role of the company in the provision of job opportunity. Unfortunately, this situation behind the low adoption of community forestry activity in the study area where the target group have no time to establish their own plantations.
- The land holdings are comparatively very small and allocated by the company to the respondents with a condition not plant trees in the agricultural land. The company could enhance different forms of community forestry like windbreaks and farm forestry to increase the green area.
- Kennana Sugar Company adopted and organized different activities for the sake of welfare of the local people beside restoration and rehabilitation of the study area. The main activities are expansion of sunt, eucalyptus and hashab trees.
- The intervention of community forestry by the company was done to involve the local people in the process of rehabilitation of the natural

resources, provision of necessary forests products, and as a mean to draw the attention of the local inhabitants from the company plantations.

- Investigation on the dominant tree species in the study area revealed that Kafur (*Eucalyptus spp*) is the dominant species particularly in the company plantations. The selection of the tree species is mainly determined by KSC.
- The majority of the respondents are either against the idea of introduction of the tree component in their farms or against the idea of increasing the stocking density of the trees. Several factors are behind this idea such as; short of land, avoidance of competition of trees with agricultural crops, difficulty of irrigation and some respondents showed that they are following the regulations of the company which highly restricts the introduction of the tree component in the agricultural land.
- There is a coincidence in the views of the local people and the KSC staff with regard to the objectives of community forestry. This shows that the objectives are clearly predetermined and agreed upon.
- The majority of the respondents agree that the community forestry should be under the supervision of the KSC under the assumption that the areas of community forestry is very small and do not require much efforts.
- Community forestry activities contributed significantly to rural and community development through provision of services like transportation, education, health, water and others.
- The method of encouraging the participation of the local people is through official instructions from the administration of forestry department of KSC, which contradicts with voluntary involvement of people in self-determine change. To develop the forestry activities in the study area, local people have to participate effectively from the point

of planning to the phase of execution. However the level of participation of the local people is considerably high.

- The majority of the respondents felt the need of different local institutions (men, women and mixed groups) to manage the community forestry, and they showed they are capable to organize themselves in simple institutions, in order to solve some problems as groups.
- All the respondents showed that there are no public meetings or lectures or seminars provided by the company. This clearly shows the absence of a specialized unit with qualified personnel in the forestry department for extension services. Accordingly, the extension services are sporadic and limited to times of planting and harvesting. Moreover, the routine extension work is carried out by the forestry staff with no background in forestry extension.
- The relationship between the local people and the company from one side and between the local people and the FNC from other side is fragile and not build on scientific basis. The existing relationship is represented in supervision of the different activities concerning the community forestry, protection and marketing of timber**.**
- The village committee is supposed to perform certain tasks for the community as a whole. In the study area the village committee is not elected (selected) to look after the affairs of the communities. The elected committee through voting or general consensus would have general acceptability by the communities and consequently the level of coordination between the local people and elected village committee.
- The KSC according to the responses of the local people provides some incentives and motivations to guarantee the sustainability of the forestry program, among these are provision of seedlings free of charge, land preparation (plouging, ridging and furrowing) besides irrigation during the agricultural season.

- Different reasons are behind the lack of participation of the whole community members in the activity of community forestry. These factors are; some respondents were not assigned by KSC for this activity, some were not asked to join the team who running the activity of community forestry and amazingly some respondents showed their interest to participate in the activity but they were not given the chance.
- Several channels are used for marketing the products of community forestry the main channel is the KSC. Brokers and peddlers in times the final felling of the community forests is not coinciding with the harvest of the company product, traders of the villages and bids.
- The target groups appreciate the environmental role of KSC in the establishment of the tree plantation. The target groups benefited from these plantations as expressed by the respondents in the form of reduction of air pollution and dust storm, reduction of soil erosion and make ecological balance.
- The majority of the respondents asserted that the community forestry activity is successful and not jeopardized by any risks or constraints. The rest of the respondents pinpointed some measures of risks like the short of land and heavy infestation of insects particularly during the agricultural season. The forestry department staff have different views concerning the constraints of institutional forestry. Theft of forests products by the local people represents the main menace against the development of the activity beside the poor participation of the local people. Moreover, the KSC is not providing the required financial requirements in the right time and as raised by the forestry department.

6.2. Recommendations

- Despite the possible success of the company-community forestry partnership, there should be a separate unit espicalized for extension

work equipped with the necessary means and ways of conducting the extension program under the supervision of qualified extensionists.

- The relationship between the company forestry staff members and the local communities should be built in the form of two-ways communications with the preference of bottom-up approach rather than the top-down approach.
- Provision of financial support by KSC to the forestry department of the company would highly enhance the development of the company plantations and guarantee its sustainability.
- To establish an effective protective unit in the forestry sector with frequent patrolling, the KSC should adopt the joint-management appraoch through the involvement of the local people in the management of the plantations.
- The FNC should clarify the roles of the institutional forests, the conditions for their establishment and their objectives with especial emphasis on the right and privileges of the local inhabitants.
- Products' marketing is a corner stone in success and sustainability of institutional forests and community forestry, so specification of proper marketing channel would enhance the expansion of such activity.

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Appendices

Appendix (1)
Local peoples' Questionnaire

This questionnaire was made to collect information about the socio-economic impacts of institutional forests. K.S.C. as a case study. The information will be utilized in a research for MSc. Degree.
Please answer the following question as accurately as possible where actual data are not available please use your closed estimation. Your answer will strictly confidential. In the questions where you are asked to tick one or more of the cases, indicate this in the space provided. Your collaboration helps enrichment of knowledge in the field.

1. Name of village ……....
2. Occupation

a) Farmer b) Stockbreeder c) Official work d) trader

3. Number of household

a) 3-6 b) 7-10 c) 10-13 d) 13-16

4. Educational level

a) Khalwa b) Primary c) Intermediate d) Secondary e) University

5. Number and type of animal and the pasture

No.	Type of animals	Number	Place of grazing
1	Goats		
2	Sheep		
3	Camel		
4	Cattle		
5	Others		

6. Do you have a farm?

a) Yes b) No

7. If your answer in the positive, what the area and the type of ownership

Area of cultivated land	Type of ownership			
	tenant	ownership	partnership	other

8. Are there trees in your farm?

a) Yes b) No

9. If you answer in the negative, can trees be introduced in your farm as an application of the agro-forestry system?

a) Yes b) No

10. State the reasons ……..

11. Have you participated in the community forests activities in your village?

a) Yes b) No

12. If you answer in the positive, state why you have done so ……...

13. If you answer in the negative, state why not …… 14. How were local peoples persuaded to participate in the community forests ……...

15. How much is the area of the community forest in the village …..

16. Who is the legal owner of community forests ……..

17. Are there contracts between the local people and the institution...

a) Yes b) No

18. Who manage this forest?
a) Institution b) Local people c) F.NC. d) Other
19. How is it decided as to who manage this forest
a) Election b) Appointment c) Volunteering committee
20. What are the project assistances to the community forests?
a) Seedlings b) Plunging c) Irrigation d) Marketing e) Other …
21. Is the managing board active in the field?
a) Yes b) No
22. If you answer in the positive, estate some examples:
a) b) c) d)
23. If you answer in the negative, state the reasons:
a) b) c) d)
24. Are there any local groups that help the trees cultivation?
a) Yes b) No
25. Mention the participating groups
a) Women b) Youth c) Men d) All this
26. What type of trees is in the community forest ……..
27. How are these types selected ……..
28. What extensional messages the project provides ……..
29. What intervals do them receive extensional information ……..
30. How are the meeting and coordination conducted …….
31. What is the purpose from the community forest ……...
a) Economic b) social c) ecological d) other
32. How are profits distributed when the forest is harvested ……..
33. Do the community forests have any contribution in the development of services in the area?
a) Yes b) No
34. If you answer in the positive, state types of services
a) Transportations b) Education c) Health d) Water e) other
35. Do you have any relation with the institutional forest
a) Yes b) No
36. If you answer in the positive, what type …….....
37. How is the product of the community forests marketed ……
38. Do the institutional forests form any kind of problem to the local peoples?
a) Yes b) No
39) If it causes any problem, state what ……
40. Do you think the community forestry in the village would continue?
a) Yes b) No
41. If you think there would be any difficulty state the causes
a) b) c) d)
42. How do you see another factory in the area and what kind of industry do you suggest ……..

Thanks for co-operation

Appendix (2)

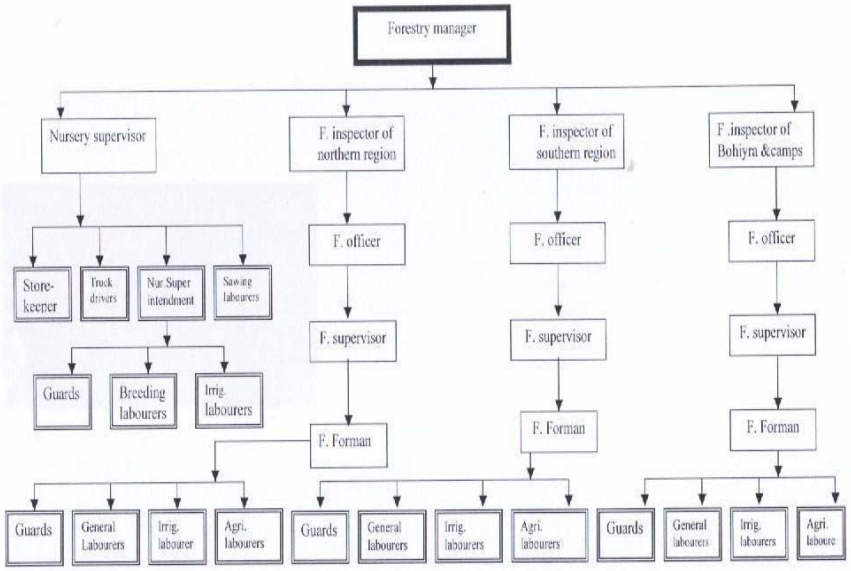
KSC staff members questionnaire

1. What are the different forestry activities covered by the project
   a) Acacia nilotica forests b) Acacia senegal forests
   c) Community forests d) Others
2. What is the aim of these activities ……
3. What are the obstacles that hinder the project?
   a) Management b) Finance c) Marketing
   d) Inhabitants participation e) Thefts
4. What kind of relationship between the department of forests in the institution and the F.N.C. ……
5. What kind of relationship between department of forests in the institution and the employees ……..
6. What method was used to persuade local people to start community forests …….
7. What aids does the project provide local people with ……
8. Is there a problem in the working force in any of the following
   a) Availability b) Wages c) Skills d) Other
9. What are the dominant tree species in the institutional forest…
10. On what basis those species were selected ……...
11. What means of extensional is used with the local people
    a) Wedding theater b) Visit to the fields c) Workshops d) Meeting
12. Are there scheduled meetings with the local people
    a) Yes b) No
13. Are there papers, studies and workshops concerned with forests sector? …….
14. If your answer in the positive, briefly state the aims ……...
    a) b) c) d)
15. What are the benefits the local people obtain from institutional forest
    a) b) c) d)
16. How is the product marketed ……
17. What is the ecological role played by the institutional forests …
18. Are there local committees concerned with forestry activities …
    a) Yes b) No
19. If your answer in the positive, how these committees are formed ……
20. Do you think that the institutional forest has helped in the development of the local communities
    a) Yes b) No
21. If your answer in the positive, state some forms of this development ……..
22. Do you think possible to consider the institutional forest as an example to be followed in other institutions
    a) Yes b) No
23. What is your personal proposal to develop the institutional forest?
24. What are future aims of institutional forests ……

Thanks for co-operation

(Appendix3)

A chart showing the administrative level of the institutional forests in KSC scheme



(Appendix 4)

Kenana sugar Company Limited

Forestry plantation stock costing sheet

		1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
		1 year age	2 years age	3 years age	4 years age	5 years age	6 years age	7 years age	8 years age	
Cost incurred in 93/94	458,044	1,135								
Cost allocation %age		100%								
Cost allocated	458,044	458,044								
Cost incurred in 94/95	8,600,834	1,130	1,135							
Cost allocation %age		65%	35%	100%						
Cost allocated	8,600,834	5,590,542	3,010,292							
Cost incurred in 95/96	9,633,000	1,532	1,130	1,135						
Cost allocation %age		30%	35%	35%	100%					
Cost allocated	9,633,000	2,949,900	3,441,550	3,441,550						
Cost incurred in 96/97	19,454,636	1,258	1,532	1,130	1,135					
Cost allocation %age		6%	21%	30%	40%	100%				
Cost allocated	19,454,636	1,750,917	4,085,474	5,836,391	7,781,855					
Cost incurred in 97/98	34,262,216	225	1,258	1,532	1,130	1,135				
Cost allocation %age		2%	14%	21%	30%	33%	100%			
Cost allocated	34,262,216	685,244	4,796,710	7,195,066	10,278,665	11,306,531				
Cost incurred in 98/99	45,987,114	512	225	1,258	1,532	1,130	1,135			
Cost allocation %age		5%	3%	15%	21%	26%	30%	100%		
Cost allocated	45,987,114	2,299,356	1,379,813	6,898,067	9,657,294	11,955,650	13,796,134			
Cost incurred in 99/00	66,715,343	1,181	512	225	1,258	1,532	1,130	1,135		
Cost allocation %age		10%	5%	5%	19%	21%	23%	20%	100%	
Cost allocated	66,715,343	6,671,534	3,335,767	3,335,767	12,675,915	14,210,222	13,343,069	13,343,069		
Cost incurred in 00/01	71,138,465	219	1,181	512	225	1,258	1,532	1,130	1,135	
Cost allocation %age		3%	12%	4%	1%	18%	21%	20%	20%	100%
Cost allocated	71,138,465	2,134,154	8,536,616	2,845,539	711,385	13,516,388	14,939,078	14,227,693	14,227,693	
Cost incurred in 01/02(f.cast)	73,220,000	650	219	1,181	512	225	1,258	1,532	1,130	1,135
Cost allocation %age		7%	1%	10%	4%	1%	19%	21%	19%	19%
Cost allocated	73,220,000	5,125,400	732,200	7,322,000	2,928,800	732,200	13,911,800	15,376,200	13,911,800	13,911,800
Total cost by age	344,313,654	5,125,400	2,866,354	22,530,150	11,409,491	6,644,210	53,549,718	68,213,233	78,586,382	95,188,766
Total area (feddan)	7,842	650	219	1,181	512	225	1,258	1,532	1,130	1,135
Average cost/feddan	43,908	7,885	13,088	19,077	22,284	30,419	42,567	44,526	69,548	83,867