THE ROLE OF EI DOM AGRICULTURAL COOPERATIVE IN RURAL DEVELOPMENT

BY

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DEDICATION

This work is dedicated to my caring mother for her love and support through my whole life, to my husband Awad Hassan who always there with support and advices when I needed.

To my daughter Roa, my son Hassan, and the new born Ahmed, Dedication extended to soul of my uncle who passed on a love of reading and respect for education.
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ABBREVIATIONS AND ACRONYMS

DECARP: Desert Encroachment Control and Rehabilitation Programme.

FAO: Food and agriculture organization of the United Nations.

FE: Forestry Extension.

FNC: forest National Corporation.

ICA: International Cooperatives Alliance.


NGOs: Non Governmental Organizations.

SFM: Sustainable forest management.

UN: United Nations.


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ABSTRACT

The broad objective of this research is to enhance greening of the national capital through adoption of tree planting in its different forms among which is forestry cooperative. Forestry cooperative of EL Dom Agricultural Cooperative (El Dom Village, north Aljilly city, Khartoum North) was selected as study case to highlight cooperative forestry. Two types of data were used in this research namely; primary and secondary data. The secondary data was collected from the archive of the Forests National Corporation (FNC), El Dom Agricultural Cooperative and relevant studies carried on the study area. The main findings of the research are; adoption of forestry cooperative intervention contributed to diversification of sources of income where women and children become indulged in the activity of tree planting with reasonable incentive. The intervention of forestry cooperative in the study area is autonomous (locally driven), where some elites proposed the activity and realized by the El Dom Agriculture Cooperation. After establishment, (FNC) contributed to the success of the intervention through provision of seedlings and technical know-how. The villagers perceive the benefits of the forest cooperative differently. Among the benefits of the forestry cooperative, as perceive by the respondents, are; great diversification of agricultural crops (provision of improve seeds), diversification of income, provision of social services (maintenance of schools and health care centre), provision of simple agricultural tools, and consolidation of social relations among the villagers. These benefits coincide with the objective behind which the forestry cooperative was established. The respondents perceived the participation of the villagers differently, but the majority (56%) assessed the participation as fair. Women and children participation is limited to seedlings rearing and irrigation. The
forestry cooperative is managed through elected committee consists of five members, and the committee works under the umbrella of ELdoom Agricultural Cooperative.

The main services and products provided by the forestry cooperative are; provision of grazing areas for the livestock, provision of round timber, and protection of agricultural fields against wind erosion. The entire interviewed sample accentuated the sustainability of the activity and its expansion through inclusion of all bare areas within the agricultural cooperative not suitable for conversion to agricultural land. There are some measures of risk and constraints confronting the activity of forestry cooperative, namely; lack of governmental commitment towards the activity, lack of enough forestry experience (technical know-how), irregular supply of electricity, and low level of participation. There are no systematic extensionists' visits to the study area.

The study arrived to sound conclusions, some of them are; there are some conditions for the membership of forestry cooperative according to which the local people become entitled to join the cooperative. The main aim of the forestry cooperative is to maximize income generation from the association through addressing forestry activities, as well as the protection of the agricultural lands against wind erosion and increasing agricultural crops productivity. The level of participation lag far beyond the ambition and the drawbacks is represented in the assignment of the activities on certain group. Lack of training for sake of dissemination of information or transfer of technical know-how. The main recommendations drawn are; the importance of governmental commitment to the activity and provision of extension services on systematic basis.
دور جمعية الدوم التعاونية الزراعية في التنمية الريفية
شاهيناز هاشم وعوض إدريس
درجة الماجستير في علوم الغابات " غابات مجتمعات"
المستخلص

الهدف العام لهذا البحث هو دراسة دور الغابات التعاونية في تعزيز زراعة المدن وجعلها خضراء من خلال زراعة الأشجار في أشكالها المختلفة ومن بينها الغابات التعاونية. أجريت هذه الدراسة في غابة جمعية الدوم الزراعية التعاونية بقرية الدوم في منطقة الجيلي شمال الخرطوم لتضليل الوضع على الغابات التعاونية.

جمعت نوعان من البيانات في هذا البحث هي: البيانات الأولية والثانية. جمع البيانات الثانوية من أرشيف الهيئة القومية للغابات وجمعية الدوم الزراعية التعاونية والدراسات ذات الصلة في منطقة الدراسة. النتائج الرئيسية لهذا البحث هي: إن الغابات التعاونية سابقة في تنويع وزراعة الأشجار حيث أن تنويع الأطفال والنساء في نسبة زراعة الأشجار مع أثرها من الجوانب، أدخل الغابات التعاونية في منطقة الدراسة بصفة مستقلة (مداري محلي)، حيث تم الانتشاط بواسطة نخبة من السكان على أن يحقق النشاط غيرجمعي للغابات الزراعية.

بعد إنشاء الغابات التعاونية كان تدخل الهيئة القومية للغابات قد شكل سماه ناجحة عبر توفير الشتل والمهارة التقنية. إن الزروريين يرون فوائد الغابات التعاونية بشكل مختلف وتمثل في التنوع الكبير للمحاصيل الزراعية وتوفر البذور المحسنة و التنوع في مصادر الدخل مما أدى إلى توفير الخدمات الاجتماعية كمساهمة المدارس ومركز الرعاية الصحية، و توفير أدوات الزراعة وتوطيد العلاقات الاجتماعية بين الزروريين. هذه الفوائد تطبقي مع واحد الذي أشتهى من أجل الغابة التعاونية. هناك اختلاف بين الزروريين في تقويم المشاركة، لكن الغالبية (56%) تقدم المشاركة كمكملة. تقتصر مشاركة المرأة والأطفال للعناية بالشتلات ورائها. تدار الغابة التعاونية من خلال لجنة منتخبة تنافث من خمسة أعضاء هذه اللجنة تعمل تحت ظلية جمعية الدوم التعاونية الزراعية.

آهم الخدمات التي تقدمها الغابة التعاونية هي:
- توفير مناطق الرعي المناسبة، توفير الأشجار المستقرة، حماية القحول المزروعة ضد التهوية بفعل الرياح.
- قد أبرزت النتائج المأخوذة من المقابلات أن استمرارية الشاطئ ممكنة من خلال زيادة الإراضي باستغلال الأراضي الهامشة في الجمعية التعاونية الزراعية وتحويلها إلى إراضي زراعية. هناك بعض المخاطر والمواقف التي تواجه نشاط الرعاية الصحية وهي: عدم استثمار الأراضي المختارة، عدم القبض على النشاط، عدم توفر الضرورات التنظيمية.
- الدراسة: مجموعة منDestinations منها: تغطية بعض شروط عضوية الجمعية التعاونية التي تفيد بأن هناك سكان المحليين الممنوحين للجمعية التعاونية، الهدف الرئيسي للغابة التعاونية هو زيادة دخل الجمعية من أنشطة الغابات، بإعداد خطة إراضي الزراعية لمعالجة التربة بفعل الرياح وزيادة إنتاج المحاصيل الزراعية، كما نجد أن مسؤولي الغابة مكونة من عدة ماستر من الطموح وتمثيل المكملة في تفصيل الأنشطة على مجموعات كبيرة، تناول التربة في سبيل نشر المعلومات أو تقل الدراسة التقنية. من التوصيات الرسمية: أهمية الالتزام الحكومي لتوجيه النشاط وتوفير خدمات الأشغال على قاعدة منظم.
CHAPTER I
INTRODUCTION

1.1. General

Sudan is the largest country in Africa extending over one million square miles. It is rich in its natural forest resource that needed to be managed on a sustainable basis in order to satisfy the needs of the present generations without compromising the resource. Recently this forest resource has been denuded and confronted by a variety of destructive factors. Robson (1989) identified several factors that cause damage to these forest resources. Frequent drought is the most important factor that causes forest deterioration followed by commercial wood trading and illegal expansion of agriculture, animal grazing, forest fire and (over-grazing). For this reason the country adopted reservation policy since early 1901 so as to conserve and properly manage the remaining natural forests. Until 1966 there were 266 forest reserves covering a total area of about 14 million hectare since then, the reservation process was progressing slowly (Wiersum .1984). The reserved forests continued to be under ineffective protection and without sustainable management plans.

Millions of people around the world depend on forests for medicine, building materials, fuel, income – and food. (FAO.1989b) estimates that around 500 million people live in or near forests, and in some places; forests are the primary source of food. But almost everywhere, forests provide regular supplements to people's diets. In many developing countries, forest foods represent a much-needed safety net, helping people get it between harvest seasons, when crops fail or during times of drought, famine or social strife. In some areas, forests support livestock production by providing fodder, and in others -- for example, coastal mangrove swamps they support local fisheries. But beyond these direct contributions to food security, the environmental services provided by forests play a critical role in ensuring sustainable
agricultural production: forests and woodlands help filter and maintain water supplies,(FAO.1989b) protect against soil erosion and land degradation, moderate climate and slow global warming by removing carbon dioxide from the atmosphere.

Forests are also rich deposits of biological diversity and provide large numbers of poor people with fuel for cooking food and heating their homes, while forest-based employment gives many others a source of cash income. The survival of forests constitutes a guarantee for the survival of mankind," says El-Hadji Sene, Director of FAO's Forestry Resources Division. They provide so many different products and services, serve so many important functions. As social forestry has a rural development focus and is heavily dependent on the active participation of people, it is also known as “forestry for local community development” or “participatory forestry”. Forestry for local community development is a new people-oriented policy adopted by FAO, the objective is to raise the standard of living of the rural dweller, to involve him in the decision making process which affect his very existence and to transform him into a dynamic citizen capable of contributing to a large range of activities than he was used to and of which he will be the direct beneficiary. Forestry for local community development is therefore about the rural people and for the rural people.

1.2 Scope of the study

In Khartoum State there are 190 forests distributed on its seven locality, al-Khartoum Locality, al-Khartoum Baḥrī Locality, Omdurman Locality, Jabal Awliyā’ Locality, Sharq an-Nil Locality, Ombadda Locality, Kararī Locally. Some of these forests are reserved and the other under reservation, while some others are not surveyed or inventoried for
reservation. The starting premise of the study is to investigate the efforts made to make the slogan of the green revolution of the state reality.

One of the possible means for the attainment of this objective of green revolution is to establish forest association. This research focuses on the role of forest cooperatives in rural development and in establishing managing, forest resource and enhancing the social aspects of the communities.

The local institutions illustrate the capacity and creativity of people to create institutions that effectively serve their needs. They are all positive examples of what can happen when people have, or are supported to take, control of their own lives in order to solve the problems they are facing. But it also rises, and leaves unanswered, many questions concerning the possibilities to work with and through local institutions as a more effective strategy for achieving sustainable natural resource management.

The relevance of such a strategy is obvious as these local institutions embody the local knowledge that has evolved in culturally and ecologically specific situations. They are the created by the people themselves who, because they are dependent on their natural resources for their survival, are most interested in maintaining them. But they do not provide a simple clear cut solution. The changes occurring in the world put heavy demands on these institutions and not all have been, or are able, to adopt; nor are all suitable for reaching the goals of equity that may consider being so important. In this research special emphasis was given to the local institution (farmers associations) in Khartoum North.

1.3. Problem statement
Forestry is one of the important natural resources in Sudan upon which many of rural communities depend on it in their life in addition to the importance of forestry in environmental conservation and as a source of goods and services for the country as a whole. Several attempts were made to enhance the
cooperative forest for sake of increasing the green area in the country, but little or no efforts were exerted to tackle the cooperative forest in Khartoum State. The current status of forests shows a decline trend in the areas of tree cover due to urban and agricultural expansion.

As a result signs of desertification represented in frequent drought cycles, dust storms and erratic nature of rains become rules rather than exceptions. Despite the great efforts exerted by the Forests National Corporation (FNC) and Local Non-Governmental Organizations (NGOs), still the level of afforestation lag far behind the ambitions of these institutions. Several factors contributed to the failure or limited success of these afforestation programs, but lack of mobilization and sensitization of local communities remain as the main factor. More specifically, lack of profound extension services to deal with dissemination of information and transfer of technical knowhow is the main problem confronted the implementation of a successful a forestation program. Forestry Cooperative of ELdoom Agricultural cooperative (north Aljilly city, Khartoum North) was selected as study case to highlight forestry cooperative.

1.4 Objectives of the research:
The broad objective of this research is to investigate the role of forestry cooperatives in enhancing greening of the national capital through adoption of tree planting in its different forms, more specifically;

- To assesses the awareness of local people towards the forestry cooperatives in the study area.
- To investigate the possibilities of sensitizing and mobilizing local communities to participate in the developing these forests.
- To highlight (gender) and (age group) to participate in the activity of forestry cooperative.
- To investigate the initiator of the activity and the strategies followed to make the dream a reality.
- To investigate the measures of risks and constraints confronting the forest in the study area.

1.5. Research questions

To tackle the research problem and attain the specified objectives, broad research questions were formulated under the assumption that finding answers to these questions will solve or enhance solving the problem of the research. These questions are;

- What is the level of awareness of local people about forestry cooperatives in the study area?
- How local people were mobilized and sensitized to participate and play role in the establishment of the forestry cooperatives?
- What are the possible working groups (gender and age groups) that are potential for the success of the forestry cooperative activates?
- What are the strategies followed to establish the forestry cooperative?
- What are the measures of risks and constraints that confront the establishment of the forestry cooperative?
CHAPTER II
LETERTSURE REVIEW

2.1. Background
In recent years there has been growing recognition that many of the actions taken in order to generate development in the immediate future fail to sustain the momentum of growth in the longer term. At best they prove to be insufficiently robust or well conceived to become self sustaining, and simply fail after a while (Pezzey, 1989). Within forestry sustainable development has been defined as "... development involving changes in the production and/or distribution of desired goods and services from forests and from trees which result, for a given target population in an increase in welfare that can be sustained over time" (Gregersen and Lundgren 1990). The concept implies production of goods and services desired by people, combined with protection of the natural resource base on which such production depends.

Development is a progress of positive change quantitatively and qualitatively. People define it in their own context according to their surroundings and immediate needs. Some therefore define it as a process by which members of a society inspire themselves and their institutions in ways that enhance their ability to mobilize and manage resources in a sustainable manner to produce sustainable and justify distributed improvements in their quality of life consistent with their aims and aspirations. For some other, it is a process involving community participation in critically identifying and analyzing their needs and problems, setting goals and making their own decisions on sustainable use of available resources to improve their quality of life. In essence, development is about people and the way they live and every society/community must initiate its own development process and the government should mainly facilitate the process through good/democratic policies. Kabanda, (2006).
Development generally signifies improvement from an undesirable state of affairs to a desirable one in any field of social living.

NGOs play a critical role in all areas of development. Role of NGOs vary over the years as the policy of government changes. NGOs are almost dependent on polices of government. The major development roles ascribed to NGOs are to act as: planner and implementer of development programmers, mobiliser of local resources and initiative, catalyst, enabler and innovator, builder of self reliant sustainable society, mediator of people and government, supporter and partner of government program in activating delivery system implementing rural development programs, agents of information, factor of improvement of the poor, and facilitator of development education, training, professionalization, etc. Basically NGOs role is to prepare people for change. They empower the people to overcome psychological problem and opposition of oppress. Its role cannot be denied.

2.2. Forest management
The meaning of forest management should be focus on social economic and environmental aspect to achieve the specific objectives of forest management. The definition of forest management was express by FAO (1989a) as (forest resources and forest lands should sustainably managed to meet social, economic, cultural and spiritual human needs of present and future generation. These needs are forest products and services such as wood and wood products, water, food, medicine, fuels shelter, employment, recreation, habitats, wildlife, landscape, diversity and reservoirs for other forest products.

2.3. Rural communities and forestry
According to FAO (1978) there are 200 million people living in the tropical forests areas and practicing slash and burn farming (shifting cultivation) on perhaps 300 million hectares of forest lands in order to provide their daily
food. In Sudan, particularly, the west part of the White Nile State, this practice of agriculture is still used. The rural communities are the most bound group to this practice. The knowledge of affecting the natural resources through this behavior is not apparent to them. So projects can assist the rural people to avoid this dramatic damage occurring every year. King (1978) stated that forestry for local community development is a new people-oriented policy adopted by FAO, the objective of which is to raise the standard of living of the rural dwellers, to involve them in the decision making process which affect them very existence and to transform them into a dynamic citizens capable of contributing to a large range of activities than they were used to and of which they will be direct beneficiary.

Forestry for local community is (therefore) about the rural people and for rural people. Its ultimate objectives are not physical but human. The physical goals, which will be set, are really means towards achieving the objectives enhancing the lives of human beings. The problem which facing foresters to achieve this objective is the traditional training of foresters, who often find themselves not well equipped to deal with people rather than trees FAO (1980). The challenge to forestry of contributing to altering the conditions of the rural poor is consequently likely to entail a radical reorientation extending from policy. In Sudan reserved area reached 8.86 million hectares. Since the time when reservation of natural forests started in 1923, the policy was to concentrate the management of forest reserves under government control to organize felling program, protection, conservation, development and management.

Also all management activities were based on forest legislation that prevents local communities from access to the forest and use of forest resources. The management accordingly reflected in protection, patrolling and policing, a practice that rendered the management program more oriented towards control and punishment rather than towards development and sustainable
management. Local people living in the vicinity of forests are the main beneficiaries legally or illegally practicing all sorts of land use inside the reserves. Such conflicting practices of government and local people as stakeholders resulted in fast forest depletion and some cases, complete removal of forest cover (Sanjak, 2000).

Since the time when reservation of natural forests commenced, not a single reserve forest has been put under proper management except the revering forest reserve All the management activities executed within the natural forest reserves are the measures contained in the forest legislation, which is concerned mainly with protection and patrolling, exercised by forest guards. No master plans have been prescribed to improve the management, forest surveys, forest maps, and technical information related to stocking, productivity, structure and species (Elsiddig et al., 1998).

2.4. Participatory Forestry

2.4.1. 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 (Blackburn et al., 1982). 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. Tropical forests are being reduced annually at rates of about 7–5 million hectares of closed forests and 3–8 million hectares of open forests. 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 (Mohamed et al., 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).

2.4.2. 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 traditional 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 fuel wood 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 a field for fuel wood and of having to divert crop and animal residues needed for soil working or as livestock feed to fuel use (Eckhom, 1975; Arnold and Jonga 1978).

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, 1989b) 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 fuel wood and other forest products in a more sustainable manner (FAO, 1981).

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 Eight 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.

2.4.3. 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 living, 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. 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. Communal projects which fulfill at least 10% of the communities need are too small to be 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 Mascarenhas, 1983).

2.4.4. Objectives of Community Forestry

It worth to clarify the meaning of the term “objective” since it is the basic of community forestry projects. An objective, both for an individual and as organization, is defined as a state or condition which should be attained in a specific time or which can be maintained for a given period (Husch, 1987). In regarding objectives, production must not be the sole objective of social forestry, although it is necessary to be considered (Saouma, 1979). In community forestry, which is a new-people oriented policy, objectives should involve the rural dwellers in decision-making processes of all activities that affect their existence and raise the standard of their living in equilibrium with the environment. The objectives should aim at transforming the local people into a dynamic citizen capable of contributing to a large range of activities (Papastavru, 1984). It should be recognized that the objectives of community forestry are numerous, varied and interdependent or compatible as far as the human element is concerned. The overall objectives as stated by (Bochet, 1983). Are:

- to increase the yield, output and income of rural societies through encouragement to adopt best methods and techniques to raise their standard of living;
to develop a soul of economic and social life collaboration and integration within the community;
- To ensure employment and to provide them with adequate infrastructures for social development.

The role of policy makers and planners is to identify broad development objectives with clear-cut priorities to allocate the capital and labor resources for rural forestry. In this way programs of rural forestry can be developed efficiently and ensure basic consistence and sustainability (FAO, 1986). (Burch and Grove, 1993) divided the objectives of community forestry into three main categories: economic, social and environmental.

The economic objectives could be; job training programs that integrate conservation training with business skills and basic education, development of micro businesses based on community resources which promote economic growth, Identification of long–term job and career path in environmentally related professions for local residents which contribute to the general socio-economic development of the rural people through employment generation.

The social objectives can be; creation of a sense of community identity and pride through tree planting, an increase in the number of available open space to the community for recreation and other activities, Creation of community-based organization for the planning and management of community forestry programs and integration of community tree planting activities with educational programs in local schools.

The environmental objectives represented in the use of human resources to better management of degraded and marginal lands. Particularly for the aim of combating deforestation and environmental degradation through the identification of environmental hazards in the community or programs to highlight local residents and to make them understand and become more aware of their impact on regional resources (Burch and Grove, 1993).
2.4.5. Constraints to Community Forestry

The main obstacles to community forestry as cited by Bochet (1983) include:

- Cultural, traditional standards dealing with the women role and young people in the community;
- Social and economic;
- Physical and technical obstacles;
- Institutional and administration constrains.

Usually constraints of a socio-economic nature are deficiencies due to ignorance, non observance or conflict with legislation like land ownership, illiteracy, existence of an indigenous population divorced from the cultural or economic life of the country, believes opposing development, lack of ecological awareness and demographic pressure on forest areas. These constrains are the most serious and difficult to eliminate (Husch, 1987).

The social and cultural influence can be subdivided into the following categories: customs and tradition, type of land ownership and rural structure of the country (Fortmann and Riddle, 1985). Land ownership is the most complex problem due to the exponential increase of human pressure with renewable attitudes and limited land size. This situation creates competition for the alternative land use particularly in the existence of the commercial markets (Papastavru, 1984). Need for agricultural lands is not the only cause for the change of the land use, however, large areas of lowland forests have been cleared to give way for commercial livestock grazing (Dewalt, 1982). Also changes in the structure and techniques of agricultural production have similarly resulted in a destructive impact on tree cover (Beale, 1975).

The institutional and administration constrains are exemplified in the assignment of qualified expert and social scientist to implement rural forestry programs with attractive incentives to stay in the rural areas. Some farmers refuse to get involved in a rural forestry program because of the reputation of
Forest department which viewed with suspicious and distrust (FAO, 1986). In many countries the lack of appropriate legislation has been a considerable constraint to the integration of forestry into rural development due to the fact that forestry usually has a long life span that requires a continuing commitment from government (FAO, 1978). The importance of the institutional and administrative program arises from the fact that success in any community forestry program coincides with its ability to sustain itself (Burch and Grove, 1993). Therefore certain preliminary actions must be undertaken prior to actual operations. According to (Bochet, 1983), these actions include:

- Increasing the awareness of the people concerned;
- Organizing their active participation from the planning stage;
- Training at all levels and in all the fields of social forestry;
- Setting up coordination bodies defining the administrative and legal arrangement, which are vital for the implementation of the program.

2.5. Local people participation in rural development

The current debate on how to involve local institutions and NGOs in forest development pays much more attention than in the past to the objectives underlying the involvement of such institutions. First, local level institutions have an important role to play in increasing the level of participation by target groups, and moving management responsibility closer to the resource base. Second, local institutions often encourage new directions in forest development, directions that are less likely to be identified by government agencies. Involving local people's institutions, mobilizing their indigenous knowledge of forest and tree resource and giving precedence to their perspective on forestry problems, has implications in terms of empowerment of local people. Encouraging them through their institutions to initiate as well as undertake forestry activities leads to the possibility of their redefining the scope and goals of those activities and the long-term use of the forest resource being developed. This, of course, influences directly the nature and
distribution of the impacts from forestry project investments (FAO, 1993a). This in turn also have implications for the kind of support that public administrations and technical forest agencies must provide. On the one hand, agencies must change the skill base of their personnel to provide new services. On the other, the government must identify and correct policies and regulations that undermine the freedom and incentives of local people and local institutions to direct and undertake activities.

One area is rules and regulations regarding tree growing, forest management, and product extraction and use. Another area is legislation underlying land and forest tenure. A third regards channeling of financial resources to governmental and nongovernmental bodies and local people. A fourth relates to giving people the ability to organize and then to recognize those organizations (FAO, 1985).

There is only a spotty understanding of the mechanisms and conditions which result in effective institutional development for forest management, development, and use. In principle that local institutions must have a dynamic rather than passive relationship with forest resource management-initiating activities and shaping directions and decisions rather than simply implementing government objectives and programmers’. The development of dynamic local institutions is often risky—local institutions may prove unable to undertake the activities or develop the organizational mechanism to sustain the activities. In addition, forestry activities can generate other political forces out of tenure or resource use rights issues that run counter to a government's desired objectives and goals, also posing a threat to the existing local power structure (FAO, 1980).

In forestry there are a number of examples of institutional arrangements for local forestry development and/or management. These include:
- Joint management arrangements, whereby local user groups become partners with forest departments;
- Allocation of usufruct rights on forest areas to indigenous peoples for sustained extraction;
- Providing forest development funds to the local administration and shifting the role of forest departments from active forest development
- Providing extension advice to these local bodies;
- Providing community development funds to enable local communities to practice
  - Agroforestry and other forms of sustainable resource management;
- Allocating state forest or other lands to targeted groups for forest or pasture development and management, sometimes with the agreement of local administrative bodies; and
- Providing technical support to self-regulating groups of users that collectively manage and use a common forest resource.

Other local issues that have important implications for the development of appropriate organizations and institutional arrangements are:
- the dependence of marginal and marginalizing populations on non-private land and water resources
- The constraints to women's involvement in forestry development in many societies. Institutional strengthening must include measures that increase women's involvement in forestry activities.

2.6. Involvement of Government Agencies and NGOs
It is the local community itself which must play the principal role in community forestry programs but at the same time government agencies and NGOs will have to make important contribution. A firm commitment by the government to community forestry development and a continuing involvement of the various services concerned is thus essential if any major
breakthrough is to be obtained. This will entail the support of community forestry objectives in national, sectoral and regional development plans (King, 1978).

Recent shift in emphasis in rural development policies towards the poor have coincided with a growing awareness that traditional extension models are inherently biased towards the more progressive and better-off elements of the rural population. After a review of experimental evidence which indicates the viability of poverty-oriented extension, a number of themes are identified which have emerged in recent attempts to focus extension program on the rural poor, in the fields of agriculture, health and nutrition education, and family planning. These include the development and testing of more appropriate technologies. The employment of paraprofessionals, the more towards group extension methods, the use of traditional performing arts, and the closer involvement of extension “client” in the design and implementation of programs. Successful programs combine meaningful two-way communication between research agencies and the rural poor, a commitment to working with the rural population, and an inherent flexibility of program objectives and components (King, 1978).

Garforth (1982) stated that since the early days of the colonial period, the generally accepted view among sahelian administrations and governments, especially in their forestry services, has been that the local people of the region are not capable of managing their local woodland resources rationally and sustainably. The outlook and objectives of these local people are regarded as being purely short-term and they are seen as lacking the skills and knowledge required for the complex tasks of scientifically-based long-term woodland management. These assumptions are false. Sahelian could not survive in their hostile natural environment without a sophisticated range of resource management strategies. Communities can only manage woodland resources over which they have some degree of effective long-term
ownership. Successful local management of natural woodlands requires a clear understanding of their ecological characteristics. Sahelian woodlands are very different from the terminate forests on which European forestry practice is based and from which many of the management models attempted in the Sahel have been derived (Kerkhof, 1995).

The key to successful community resource management is the legitimacy of local governance among the major groups. In this context, legitimacy effectively means being compatible with local perceptions of social and cultural justice. If a forest management practice is to be right full in the eyes of local people, it must conform to generally accepted customs and local knowledge. It should also reflect the diverse and sometimes conflicting relationships within the community. If it is to meet these criteria, it must, almost invariably, be locally negotiated forest management system. National policies and project strategies which brush over the complexity of local communities always run the risk that one stakeholder group will highjack the emerging opportunities (Kerkhof, 1995).

A significant capacity for local forest management already exists and is being exercised in a large number of areas. Most sahelian communities now have the capacity for managing schools, credits schemes water pumps and medicinal stores. While these capacities may not be available for woodland management at all times, they provide a basis for occasional tasks such as collection of signatures for a forest appropriation procedure, codified monitoring, and suing a transgressor in court, if necessary. If woodland management is locally recognized as providing community benefits and the institutions involved are representative of key user groups, the required capacities will almost certainly be available if they are really needed. It may also be possible to foster mutual interests to strengthen local woodland management capacities. Woodcutting, for example, is often carried out by the poorer groups who have the potential to act as forest guardians but lack
formal education. Those who are economically well off may not depend financially on wood cutting but need to buy forest products from others, while their livestock, guarded by pastoralists, requires secure access to forest. While such people may not participate in the actual guarding of the forest, their literacy and contracts are an important community resource. Working together, the various village groups can provide the full range of capacities required for effective woodland management (Kerkhof, 1995).

2.7. Reduction of costs of woodland management for sustainability

Kerkhof (1995) showed that if woodland management is to be an attractive and self-sustaining option for local communities, the local benefits must exceed the local costs. This is difficult, if not impossible, to achieve with the current establishment and running costs of fuel wood markets and other highly prescriptive woodland management approaches remote by various agencies. Cost reduction opportunities, which can be considered, include the following:

- Leave delineation of woodland boundaries to villagers and representatives of local government.
- Abandon the “scientific” harvesting quota system and allow local institutions to use their own discretion.
- Leave forest inventories and other forms of monitoring to villagers. If the administration wishes to use more complex systems to monitor long-term changes, the costs should not be charged to local forest management
- Drop any pressure on local management institutions to make investments in active forest restoration;
- Leave guarding and enforcement to local institutions with only those cases, which cannot be resolved locally being dealt with at higher levels.
- The quality of local forest management should not be measured by the principle of sustainable maximum wood yield.
Different communities will make different choices based on their own changing needs and opportunities. These may involve significant land-use changes including gradual conversion into integrated systems of forestry, livestock and agriculture. Such changes occur in any case and are more likely to be ecologically and economically sustainable if they are under the control and responsibility of the local communities who will suffer if they are carried out irresponsibly FAO (1988).

2.8. The concept of sustainability
The concept of sustainability has gained general acceptance but much uncertainty still exist on how to put the concept into operation (Nilsson etal, 1991) Sustainability embodies three concepts, namely;
- Sustainable management of forest resource
- Sustainable development of forest resources
- Forestry for sustainable rural development

It worth mentioning that there is an opposing idea tackled by Carter (1996) stating that the term could have quite different meaning for different people. Local people may express containing to exist and supply their need and for future generation. While traditional forester have tended to view sustainable Forest management in term of non diminished timber supplies over series of National felling cycle, while conservationists are concerned by and there should be no loss what so ever in habit rich ness.

2.9. Criteria and indicators of sustainable forest management
A criterion is category of condition processes of which sustainable forest management may be assessed. A criterion is category of condition processes of which sustainable forest management may be assessed (Journal of forestry; 1995). Many international initiatives share common objectives to develop the means to assess and report on progress towards SFM at the national level as well as to develop of sustainable forest management each criterion has
number of indicator that recognize sustainability concept in forestry (Evans; 1996)

2.10. Sustainable forest management
Sustainable forest management (SFM) is the management of forests according to the principles of sustainable development. Sustainable forest management uses very broad social, economic and environmental goals. A range of forestry institutions now practice various forms of sustainable forest management and a broad range of methods and tools are available that have been tested over time.

The Forest Principles adopted at The United Nations Conference on Environment and Development in Rio de Janeiro in 1992 captured the general international understanding of sustainable forest management at that time. A number of sets of criteria and indicators have since been developed to evaluate the achievement of SFM at both the country and management unit level. These were all attempts to codify and provide for independent assessment of the degree to which the broader objectives of sustainable forest management are being achieved in practice. A definition of the present day understanding of the term sustainable forest management was developed by the Ministerial Conference on the Protection of Forests in Europe MCPFE), and has since been adopted FAO (2005).

It defines sustainable forest management as: the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems FAO (2005).
In simpler terms, the concept can be described as the attainment of balance - balance between societies's increasing demands for forest products and benefits, and the preservation of forest health and diversity. This balance is critical to the survival of forests, and to the prosperity of forest-dependent communities. For forest managers, sustainably managing a particular forest tract means determining, in a tangible way, how to use it today to ensure similar benefits, health and productivity in the future (FAO, 1996).

Forest managers must assess and integrate a wide array of sometimes conflicting factors - commercial and non-commercial values, environmental considerations, community needs, and even global impact - to produce sound forest plans. In most cases, forest managers develop their forest plans in consultation with citizens, businesses, organizations and other interested parties in and around the forest tract being managed. Because forests and societies are in constant flux, the desired outcome of sustainable forest management is not a fixed one. What constitutes a sustainably managed forest will change over time as values held by the public change (FAO, 1996).

2.11. Sustainable Forestry Development through Forest Cooperatives

In Korea, forestry activities have traditionally been accomplished by the government, private sector and Forestry Associations. Forestry Associations in Korea are based on the rural people's self-regulated organization from the 15th century, named "Sanrimgae" for forest protection. The Sanrimgae have been reorganized into modern form for the 20th century. The modernized Forestry Association's main purposes are supervision of forestry related business affairs including execution by proxy of government forest projects, establishment of the foundation for self-supporting operation, systematic organization and structure adjustment. However because of the Forestry Associations two purposes for establishment, the two development way, the different membership in unit level, it is reasonable for Forestry Association to change into the Forestry Cooperative, the purpose of which should be the
economic one of protecting the member's welfare. It means that the organization for forest owners excludes the government's interference on Forestry Association up to now (FAO, 1996).

Government has supported about 770 forest technical guides to the provincial Forestry Associations during the past 10 years, who can consult with forest owners and can provide the advanced forest technical and economical information. However because of economic weakness of forest management, the forestry guidance project faces financial constraints. The forest land owners feel uncomfortable with the Forestry Association's negative or inadequate activities and complain about that. Therefore, for the future development of Korea's forestry, it is essential to have the forest owner's voluntary participation, and it is also urgent for the Forestry Associations to be able to accomplish their organizational constitutional development (Astorga, 1990). The Forestry Cooperatives, which are non-governmental forest organizations, play important roles in implementing the forest owner's activities. The goal of Forestry Cooperatives is to manage their forest rationally by enlarging management scale through cooperating production elements such as forest land, labor, and capital of the small-scale private forest owners, and to improve the socio-economic position of the members (FAO, 1996).

In 1993, the Forestry Associations were reorganized into Forestry Cooperatives, whose members are forest owners who want to voluntarily participate. For the cooperatives predecessors, the Forestry Association, membership included all forest owners and village residents in mountain areas For reforestation and forest protection. For this, "Forestry Cooperatives Law" replaced the "Forestry Association Law" in the same year. Now the Forestry Cooperatives have 2 levels, one is the unit level in 142 Provinces, and the other is the Federal Cooperatives of which the individual forestry cooperatives are members. The former Forestry Association had 3 levels, and
units were village forest associations composed of forest owners and neighbors' in the village. It was a useful mechanism for government to reforest and protect the forest surrounding the villages. The number of the unit associations was about 20,000, and the number of the middle level organizations "provincial forest associations" (which had the unit village forestry associations as members) was about 142. The Federal Association had the provincial Forestry Association as members. However it is more helpful for forest owners if there are reduced levels in the organization, because of multi-level disadvantages for sustainable forestry development. Between now and 2010, the 3rd level, "Sanrimgae" will be disbanded and will disappear. After 1993, there are many changes in Forestry Cooperative's activity, and a lot of advantages for sustainable forest management in Forestry Cooperatives' business (Chamber, 1986).

2.12. The Diversity of forestry cooperative's business

The current business of Forestry Cooperatives includes planning of reforestation, management and harvesting, collection, storage, selling of forest products, and loans of forest funds. Among them, the silviculture for the member increased 2 times in 2 year from 1993 to 1995, and by-product marketing such as mushroom also increased 1.8 times. Federal Forestry Cooperatives are also considering supplying the drinking water, which is produced in mountain areas, to urban people to increase the efficiency of member's forest management (Wiersum, 1984).

To stimulate the activity of Forestry Cooperatives, Government also increased the financial support for the small-scale forest owner. Especially the special financial subsidy increased 4.4 times in 2 years. With this Federal Forestry Cooperatives started the mutual financial business in 1994, and 57 Forestry Cooperatives joined this business, and the total amount is about 0.2 billion dollars in 1995 (Chamber, 1986). The SFM is the core target for the 21 century. Fortunately, Korean Forestry Cooperatives was permitted to get the
membership of the International Cooperatives Alliance (ICA) in June 1996, and it would be the good chance to strengthen the cooperation for sustainable forestry development with the other countries in future.

2.13. Services Provided by Forestry Co-operatives
There are four types of services that a co-op might provide for its members. The first one is in the area of marketing: this has received a lot of the attention right now, with the notion of value-added processing that the co-op would harvest wood from people's land and then sell it to someone else down the product chain, and landowners can capture more of that value-added. It could also be things like joint timber sales, or joint marketing of timber sales, or having a joint wood yard. The second thing is a supply cooperative. That's where a group might band together to purchase various goods. An example in forestry is bulk purchasing of trees for the members and buying them at a bulk rate, and passing that discount on to their members (Keyworth, 1994).

A third example would be providing some type of service. In this case, it might be providing some kind of professional forestry service. May be the co-op has a forester on retainer or employs a forester who provides services to the members at a cheaper price than a landowner might be able to find outside the co-op. The fourth and last one, it's probably very present in this current, new wave of cooperatives, is the idea of education. Co-ops provide their members an education about forestry. Not only going to a field day, but actually going out and trying to do some of these practices on the ground, that's another way they help their members become better managers of the land (Keyworth, 1994).

2.14. Forestry cooperatives in the Sudan
The first experience of forestry cooperatives in the Sudan is linked with the Restocking of Gum Belt Project. This is one of the biggest projects for combating desertification in the Sudan. It started as integrated Sahel
Programme in 1980 with the Swiss-based International Union for Child Welfare (IUCW) as the sponsoring agency. The project became the restocking of gum belt project in 1981 financed through the United Nations Sudano-Sahalian Office (UNSO) on the basis of financial contribution mainly from the Netherlands for development cooperation. The project has been designated as of high priority by the Government of Sudan in strategy to combat desertification and is contained in the Government’s Desert Encroachment Control and Rehabilitation Programme (DECARP) as formulated in 1976 in collaboration with the United Nations Environment Programme (UNEP), Food and Agriculture Organization (FAO), and the (DECARP, 1976).

The project designed in three phases: Phase 1 commenced in 1981 with UNSO assistance made possible by a grant from the Government of the Netherlands, and was formulated to initiate the reversal of environmental degradation in the gum belt of Kordofan region and to reintroduce economic activities suited to the ecology of the area. The immediate objective of phase I summarized as the rehabilitation of gum gardens through the provision of seed, seedlings and extension inputs to farmers for the dual purposes of desertification control and of enhancing the productivity of the area with special emphasis on women role. The project provided for the establishment of an extension services through which the immediate objectives were to be achieved. Phase 1 was immediately followed by phase II, ending in June 1989, with the aim of expanding the achievements of phase I. Phase III began in January, 1991 and extended until the end of 1995, basically as a continuation and expansion of the earlier phases. Activities were undertaken to meet two objectives via: creation of self-reliance within rural communities; and consolidation and expansion of previous achievements (Ramly, 2008).

The major change that introduced in phase III was that the concept expanded to promote the maximum financial return from gum Arabic production for
both past and future project participants through the formation of farmers’ associations, which are intended to reduce dependency on the traditional “Shyl” system. The project is based on the provision of extension inputs through ten extension centers in three districts of Northern Kordofan and to enable local communities to become self-reliant in reversing the trends of environmental degradation by the end of the project period (UNSO, 1989).

2.15. Establishment of Associations
The gum belt project promoted the formal structuring of farmer groups into registered Farmers’ Associations. The initial Associations comprised farmers whose income derived predominantly from the production and sale of gum Arabic. The project assisted the establishment and effective implementation of twenty Farmers’ Associations by the end of 1994.

Moreover FNC established additional twelve associations after termination of the project until 2001. a major aim of these Associations is to maximize the farm-gate returns to rural communities through skills- transfer particularly by improved tree- tapping; value added by cleaning, grading and packaging; and collective delivery and marketing. Relevant components of this transfer will also be available for commodities other than gum Arabic. A lot of efforts were done to increase farmers’ technical know-how and raising of their managerial skills through specific skills training, workshops, and field-days for both Field Extension Agents (FEAs) and Associations committees (chairman, treasurer and secretary).

In 2002 FNC evaluated the activities of the associations in Northern Kordofan State in one day seminar and field day attended by all stakeholders from different agencies and agricultural ministers from six different states familiar with gum production. The workshop recommended the replication of the model of the associations all over the gum belt in Sudan. In 2003 the FNC proposed to the Ministry of Finance to employ 115 forestry graduates to
organize the establishment of Farmers’ Associations in gum producing states in Sudan. Up to date about 250 associations were established in Blue Nile, Upper Nile, Western and Southern Kordofan, Gadarif, Senar and North Kordofan.
CHAPTER III
STUDY AREA

3.1. Location
The study area is Khartoum State which is one of 26 states comprising Sudan. Khartoum State has an area of about 22,122 km\(^2\) (8,541.4 sq mi), and an estimated population of 7,152,102 million people growing at an alarming rate of about 7% per year (population census, 2008). Since 1984 the state has received an estimated 3 million migrants and displaced people due to famine and civil war. This uncontrolled urban growth has occurred at time of economic hardships; run-away infection; rampant open and disguised unemployment; serest economic restructuring programmes and international development assistances that has been reduced to humanitarian; life –saving aid. Figure (3.1), (3.2) shows the study area.

3.2. Administrative structure
According to the system of local government, the state is divided into seven locality, al-Khar\(t\)oum Locality, al-Khar\(t\)oum B\(h\)\(r\)\(r\)\(i\) Localiry, Omdurman Locality, Jabal Awliy\(\mathring{a}\) Localiry, Sharq an-Nil Locality, Ombadda Localiry, Kar\(r\)\(i\) Locality. Table (3.1) shows the administrative structure of Khartoum state (provinces and number of localities).
Table (3.1): Administrative of study area

<table>
<thead>
<tr>
<th>State</th>
<th>Localities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khartoum</td>
<td>1- AL-Khartoum Locality</td>
</tr>
<tr>
<td></td>
<td>2- AL-Khartoum Bahri Locality</td>
</tr>
<tr>
<td></td>
<td>3- Omdurman Locality</td>
</tr>
<tr>
<td></td>
<td>4- Jabal Awliya' Locality</td>
</tr>
<tr>
<td></td>
<td>5- Sharq an-Nil Locality</td>
</tr>
<tr>
<td></td>
<td>6- Ombadda Locality</td>
</tr>
<tr>
<td></td>
<td>7- Karari Locality</td>
</tr>
</tbody>
</table>

Each province consists of number of localities. The above table shows the number of localities in each locality.
Figure (3.1): Study Area (Khartoum map)
Figure (3.2): The Study Area ELdooom (Abu Doom)
3.3. Natural Vegetation:

The whole area of Khartoum State falls in the semi-desert ecological zone according to Harrison and Jackson (1958). This zone include combination of herbs and grasses associated with scattered trees and Acacia species: *Acacia tortilis* sub sp tortilis, *Acacia tortilis* sub sp radiana and *Acacia tortilis* sub sp Spirocarpa are the most dominant species in the area in general and the sandy, loamy valleys region in particular. In the parts with more clay soil a number of species occur with the dominate *Zizphus spina Christi, Balanites aegyptiaca, Acacia nubica*, beside *Acacia nilotica, Acacia seyal ver seyal* in the Blue Nile banks and valleys.

Two categories of grass cover are found in the area, the first one is annual grasses which complete their life cycles in a short time, and these include Aristida species, *Indigofera Hochstetler* and *Aristida adscensionis*. The second category of grass vegetation is the perennial grass species (part of the Butanea plain). There are many kinds of indigent trees growing wild in most of the state, that can be rehabilitated and managed properly, and their products can generate income for people in the urban areas. The natural grazing area in the state is estimated as +_ 40% of the total area. The annual grassland and forbs (herb) from about 75% of natural vegetation cover while the perennial grasses and shrubs –tree from 5% and 20% respectively. Along the banks and sometimes the islands of the Blue Nile, and River Nile on uncultivated areas along the terraces the following woody spices are found (Harrison and Jackson, 1958).

3.4. Climate

The prevailing climate is semi-desert to dry (Kevie, 1973) It is hot, dry and rainy during summer, cold dry in winter. Most of rainfall occurs during July and August. The annual rainfall is 75-160mm/year. The dry season reaches 8-10 months
So the study area is characterized by hot tropical conditions as result of its location in the southern margin of the big desert, which is characterized by three seasons: Summer, winter, and autumn (Sahin, 1976). According to Khartoum Metrological Station the daily average maximum temperature 37.7c, while the daily average minimum 21.6c.

In east Nile province rainfall occurs between Julys – October with most of the rain usually falling in August which, together with July, account for75% of the total rainfall. Rainfall in the area is highly erratic and unpredictable in quantity and duration and usually ranges between 100-300mm per annum (Shahata, 1974). In the period November to March wind is cold dry north easterly, from March to June , the same north easterly wind become dry and hot , and between June and October wind become moist south westerly with a wind speed of 9 mile / hour (Wagialla, 1999).

### 3.5. Soil and topography

The soil of the study area resulted from the interaction between the climatic factor, organic resources and the basic rocks. The study area is covered by various types of soil .The surface soil in the north western parts is dominated by clay soil .the soil distribution pattern is as follows: Modern soil, which is found in valleys and low areas that cross the study area and along the Blue Nile banks and it is considered a good pasture area. The Nubian formation which resulted from the erosion factors includes the sand, gravel silt and clay crumbs around the plateau (found in the central part of the study area and in the low area). In the eastern part of the study area there is a great formation of clay soil resulting from the crumbing of the basic rocks. The heavy clay soil (Found in the southern part of the study area) has a profile consisting of three layers (strata); the thickness of the upper layer is one foot with brownish color and high amount of sand (shahata, 1974). Different soil types exist in the state with different physical and chemical characteristics. This variation is mainly due to the geological formulations. The area is mostly flat with little complex
topographical formation; the ancient geological time is obvious in the study area by the scattering of rocks which resisted erosion and weathering factor. In recent time most of the area is covered by sand, sediment clay, volcanic, and Nubian rocks, Nubian sandstone is dominant, with basement rocks in the southern part of Abou Dlig locality and Khang Al Sabloga (Wagialla, 1999).

3.6. Geological formulations

There are several geological formulations in the study area namely:

- **Basement complex:** it covers the northern part of the state. Most of this complex from grantee rocks which resist the weathering. It found along the Nile narrow strip from Elfaki Hashim passing through Aljilly and Wad Ramli.

- **Nubian sandstone:** it covers most of the state with different forms and liable to weathering forming the red gravel land

- **Gezira formation:** it exists along the two rivers White and Blue generally nine categories of geomorphologic units of Khartoum State were identified by Elf doll (2000)

- **Parent materials:** the parent materials of the soils of the state have different origins, these are: - water deposits, sandy aeolian, weathering materials from Nubian sandstone, and weathering materials from basement complex.

3.7. Land-use

The total area of Khartoum State is about 290000 square kilometer which is equivalents to 5 million Faddans and the total cultivable land 1.8 million Faddans. Only 0.6 million (30%) cultivable land is under cultivation. about 0.4 million Faddans is occupied by infrastructure (22%). According to land – use pattern, the agriculture lands in Khartoum State can be classified as follows:- small farms 60%, cooperatives sector 25%, and large schemes 15% (71000feddan) August (Anon, 1982).
3.8. Economic activity

The fertile cultivable land is extended along the White Nile, the Blue Nile and the River Nile banks. The Khartoum State is also home to huge animal wealth. In Rich sites for mineral resources are on the northern and southern parts of the state. Investment opportunities in the field of economic services in the Khartoum State appear as a natural outcome of the progress achieved in areas of industry and agriculture. This was made possible in light of the increasing population in the state and the rising demand for necessary services. Investment in the Agricultural Sector in Khartoum State is characterized by its huge agricultural potentialities, where cultivable land extends along the White Nile, the Blue Nile and the River Nile. As a result of these potentialities, many mixed farms have been established under the public sector and other regional institutions e.g. the Arab Company for Agricultural Development. In addition to that, other major projects have also been established which cover thousand Faddans of irrigated lands including the proposed Sondos Agricultural Project.

3.9. Population

Based on population (population censuses, 2008) the total number of population in Khartoum State is estimated at 7.152.102 million with average annual increase of 13.7%. Table (3.2) illustrates the population trend according to population censuses of Sudan. The number of people of Khartoum State is continuously increasing due to reasons of rural–urban migration and problem of drought and desertification and deterioration of basic services in rural area.
Table (3.2): Regional population distribution for year, 1973, 1983 & 1993

<table>
<thead>
<tr>
<th>Region</th>
<th>1973</th>
<th>1983</th>
<th>1993</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Pop</td>
<td>Rank</td>
</tr>
<tr>
<td>Sudan</td>
<td>100</td>
<td>14114</td>
<td></td>
</tr>
<tr>
<td>Khartoum</td>
<td>7.8</td>
<td>1096</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Department of Statistic (2002)

3.10. Nongovernmental organizations involve social forestry in Khartoum state

The state received plethora of NGOs in the different development fields. The main organizations are; green crawl Sudanese, Sudanese Association to fight aides environment pollution, Sudanese Environment consecration, Environmentalists Society, Sudan Social Forestry Society, Local action, Nile discourse, Humanitarian aid organization development, Organization for the development of sanitation and environmental protection, General Cafe Sudanese Community Development, General environmental information, Organization of the future for the care and rehabilitation of Young People, Babker Badrri scientific association for Woman Studies, Organization for Sudan I, Wings global health, General farming and care of palm, Organization of mother Belver chary, Organization of green orbit, Sudanese association to protection of environment,
CHAPTER IV
METHODOLOGY

4.1. General
This chapter presents the method of data collection used for the study, and includes description of scope of research, in order to achieve the objectives of the study.

4.2. Selection of the study area
Forestry cooperative is an old forestry institution in the field of forestry science but in the Sudan the notion is almost brand new. Since the introduction of the concept in the 18th century in Europe, it was only adopted in the Sudan in 1989 by the project of Restocking of Gum Arabic Belt. The first experience of forestry cooperatives in the Sudan is linked with the Restocking of Gum Belt Project which is started as Sahel Programme with the Swiss-based International Union for Child Welfare (IUCW). Recently, in Khartoum State – Khartoum North Province the notion of forestry cooperative was adopted at ELdooom Village. Cooperatives of gum belt were subjected to some studies (Ramli, 2008). This research attempts to highlight the experience of forestry cooperative in Khartoum State. Accordingly, the selection of the study area was made purposively.

In this study, two types of data were collected to provide the necessary information, namely; primary and secondary data. The source of the secondary data includes FNC documents, files, articles, and annual reports. The primary data were principally collected to investigate the level and willingness of the people in adoption of community forestry through the extension efforts. More specifically, the data cover the main items of the objectives of the study mentioned in Chapter I.
4.3. Sampling Techniques
All the people of ELdoom village were considered as a target group for this research. A random sample of ELdoom respondents was selected for this research. The randomization was made on the basis of interviewing the first houses in which the head of the family is available. Accordingly random sample of so respondent was made repelling 50 house hold (10% of the total household in the ELdoom village.)

4.4. Team of data collection
The team consists of six qualified and widely experience extension officers, three males and three females. The members of data collection, were selected based on the following criteria

1. They are familiar with the village.
2. They have enough experience in data collection from the group

For reliable data collection through questionnaire, the researcher trained interviewers for two days on general orientation regarding the nature of work, techniques of interviewing and processes of data gathering. The data was collated by face to face interviews, the interview started by a general talk and a brief explanation about the nature and objectives of the study to gain the trust and confidence of the respondents to ensure the collection of most possible reliable data.

4.5. The main contents of the questionnaire
The main contents of the questionnaire are the issues mentioned in the research question CHAPTER I, namely;

- General characteristics of respondents (age of respondents, educational level, source of income and gender)
- History of the cooperative forest (date of establishment, initiator of the idea, rules for membership)
- Attained benefits and expected benefits from the adoption of the intervention
- The objectives of the establishment of the cooperative forest
- Participation of the local people
- Role of women in the forestry activity
- Marketing and distribution of benefits
- Measures of risks and constraints confronting the cooperative forest

4.6. Construction of the questionnaire

The construction of the questionnaires was made according to the guiding of, FAO (1989). The first step in the questionnaire construction was the preparation of the draft questionnaire through conceptualization by drawing a list of data required, corresponding to specific objectives by choosing quantifiable parameters or indicators for the assessment of the private forest program components. For the provision of reliable, valid and accurate data, well–phrased items, the following guideline of Burchinal (1986) and FAO (1989) were given special consideration.

The guidelines were:
- To be certain that each question was relevant to the topic and necessary.
- To ask the questions that the respondents can and are willing to answer.
- To express each question as simple as possible.
- To be sure not to use "double–parallel" question.
- To be certain not to use leading question.
- State questions in specific concrete terms.
- To obtain criticism of all prepared items by colleague or a friend.
- To state the item in the language respondents use in every day conversation.
4.7. Organization of items

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

- To begin with simple, easy to answer question.
- To place sensitive or more complex question 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 questionnaire. The introduction was written short, simple sentences in the local languages used by respondents and in the words they understand. The introduction was composed of the following elements:

- Identification of the person conducting the search.
- Explanation of the purpose of the study and why it is important.
- Explanation of why the respondents, cooperation is important.
- Explanation of how the respondents were selected and assurance that answers would be protected and not made known to anyone else to assure confidentially.
- Finally brief of appreciation was added at the end of the questionnaire.

4.8. Pre-testing

A draft questionnaire was only a first attempt to construct a scientifically reliable and valid measuring instrument. The final step was to test the draft questionnaire thoroughly to discover and correct any flows in it. The purpose of the pre-test to make sure that the questionnaire would deliver reliable and valid data for answering the problem under investigation.

The procedures of pre-testing involved various respondents. The students (final year) of faculty of forestry, University of Khartoum through a related study course of social forestry were asked to critique the questionnaire, and to
estimate how well intended respondents will be able to respond to the questionnaire. According to comments of the students, the draft questionnaire was revised. Moreover, another pilot test was made with the post-graduate students of the department of forest management, faculty of forestry, conducting their researches in the same branch of science. Few forms were distributed through them to persons similar to the intended respondent. Finally, the supervisor checked the questionnaire, and accordingly, some questions were removed, some new replaced others, and some question were changed in order to eliminate ambiguities, biases and other factor which may reduce the effectiveness of the questionnaire. After the pre-testing, the contents of the questionnaire were materialized into simple forms with minimum items to obtain necessary information. Then the questionnaire was put in its final form.

4.9. Statistical analysis.

The statistical analysis 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 too many of the questions being asked in the survey. SPSS Computer program was used for the analysis of the data.
CHAPTER V
RESULTS AND DISCUSSIONS

5.1 General characteristics of the respondents

5.1.1 Educational level

Educational efforts have been directed at various aspects of plantation establishment and management, marketing and consumer satisfaction for sake of enhancing resilience of local communities. In the study area education is better compared to any other place in the country due to the closeness of the study area to the national capital. Table (5.1) shows the education level of the respondents in the study area.

Table (5.1): Educational level in the study area

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Illiterate</th>
<th>Khalwa</th>
<th>Primary</th>
<th>Intermediate</th>
<th>Secondary</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-33</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>9.5</td>
<td>14.3</td>
<td>33.3</td>
<td>42.9</td>
</tr>
<tr>
<td>34-49</td>
<td>15</td>
<td>0</td>
<td>6.7</td>
<td>13.3</td>
<td>6.7</td>
<td>40</td>
<td>33.3</td>
</tr>
<tr>
<td>49-65</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>12.5</td>
<td>25</td>
<td>37.5</td>
<td>25</td>
</tr>
<tr>
<td>&gt;65</td>
<td>6</td>
<td>16.7</td>
<td>0</td>
<td>0</td>
<td>16.7</td>
<td>50</td>
<td>16.7</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>7</td>
<td>19</td>
<td>17</td>
</tr>
</tbody>
</table>

From the findings of the above table, the level of illiteracy in the study area is relative low (2%), and the preschool qouranic education (Khalwa) is also low (2%). These findings are completely different compared to that in the rural areas in the other state where the illiteracy and Khalwa education is relatively high. Ten per cent of the interviewed sample pursued their education to primary level, while 14% accentuated that they pursued their education to intermediate level and 38% to the secondary level. Those who had the chance to continue their education to the university level represent 34% of the respondents.

From the above findings it is clear that the level of education of the respondents is relatively good and this could be attributed to the availability
of schools services in the study area. Since literacy is different extensive method, the participation of the local people in forestry cooperatives, it is possible to apply, This agrees with ALkhidir (2003) who emphasize that the educated people are potentially capable of following Instruction and interpret the extension massages compared to illiterate.

5.1.2 Source of income in the study area
Economic activities vary considerably from one area to another and from one community to another. In the study area the sources of incomes are shown in Table (5.2).

Table (5.2) the economic activities of the respondents in the study area

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Occupations (Jobs) (%)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Farmer (land owner)</td>
<td>33.3</td>
<td>19</td>
<td>14.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Government employee</td>
<td>60</td>
<td>13.3</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other jobs</td>
<td>62</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18-33</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34-49</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49-65</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;65</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental factors play a significant role in determining the economic activities for the rural people. Sources of income may vary from agriculture to animal rearing and some other supportive activities. It worth mentioning that, a forest landowner cooperative is a way to produce more income for a forest landowner. This is done by: pooling resources with other, by adding value to the forest products, and with centralized marketing to get the highest returns possible. This higher return allows the forest landowner to practice sustainable forestry.

Forty-eight per cent of the interviewed sample asserted that they are farmers and they are the real owners of their farms, while the rest of the respondents stated that they are farmers but the land tenure is governmental property. This agrees with GTZ (2005) showing that in India the Petén’s municipalities have
138,000 ha of municipal, in which a large part of the land has been leased to local communities to use for self-consumption. A lot of the land has also been illegally occupied. To deal with the problems of degradation and unruly exploitation, it was decided to promote the creation of forest cooperative. These findings agree with EL Hadi (2005) who clarified that agriculture is a complementary source of income to farmers in the study area. This situation makes it difficult to approach farmers for sake of adoption of new interventions.

Twelve per cent of the interviewed sample showed that their essential post is governmental occupation and farming represents an additional source of income. A similar percent of respondents (12%) stated that they have other jobs besides farming. A Cooperative Forest is among the activities that supports the income of some respondents in the study area. This finding is similar to that of the American Tree Farm System that encourages private forest owners to actively manage their forests in a sustainable manner for multiple values (American Forest Foundation (2009).

5.3. History of forestry Cooperative in the study area
The history of ELdoom Agricultural Cooperative is dated back to as early as 1967. Table (5. 2) shows the time of establishment of the cooperative and the conditions of membership.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Time of establishment %</th>
<th>Idea forest association %</th>
<th>Establishment of forest association %</th>
<th>The rules of membership %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1967</td>
<td>2001</td>
<td>2003</td>
<td>&gt; 18 year</td>
<td>Villager</td>
</tr>
<tr>
<td>18-30</td>
<td>21</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>34-40</td>
<td>15</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>49-65</td>
<td>8</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>&gt;65</td>
<td>6</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>%</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
This finding is supported by all the respondents irrespective of their age an indication that the history of the cooperative is retold every now and then from one generation to another. As far as the forestry cooperative is concerned, the entire interviewed sample asserted that the idea was developed early (2001) by a group of elites from the village and the practical steps to convert the dream into reality was on 2003 as indicated by all the respondents.

These conditions are almost similar to that highlighted by Ramli (2008) in relation to the associations of the gum arabic in North Kordofan State, with the addition of the conditions of commitment of paying membership fees, honest and repayment of the credit

Although the adoption of the innovation of the associations in the study area is high, still a considerable proportion of the respondents did not participate in the act. This is almost similar to what was happened in the gum producers association where many farmers were not recruited or encouraged to join the associations.

The respondents asserted that there are certain conditions for the membership of the cooperatives, among which are; to be of an age equal or greater than 18 years, to be a permanent resident of the village, commitment to all instructions and guidance provided by the cooperatives as stated by 66.7% of the interviewed sample, and possess enough experience in farming beside the good reputation.

The entire interviewed sample asserted that the establishment of the cooperative is autonomous (locally driven), an indication that no outsider has introduce the idea of the forestry cooperative in the study area.
The villagers perceive the benefits of the forestry cooperative differently. Figure (5.1) shows the benefits from the establishment of the association in the study area.

Figure (5.1): Benefits of the associations

The idea emerged during the common social discussions which tackle different issues that concern the village inhabitants. A gender issue was considered as critical issues for the services of the cooperative. Therefore, women were not considered in the planning phase of the forestry cooperative, this agrees with (FAO, 1980) showing that the constraints to women's involvement in forestry development in many societies.

Institutional strengthening must include measures that increase women's involvement in forestry activities. On other hand Hoskins (1993) showed that development experts should, however, feel compelled to think about men and women independently, primarily because independent consideration increases the potential for the design, implementation and management of effective, sustainable development activity.
The entire interviewed sample agreed that the association contributed significantly to diversification of income generation beside other benefits. All the respondents asserted that the income generation increased dramatically after the establishment of the cooperatives particularly effect adopting of forest. Moreover, all the respondents stated that there is great diversification of agricultural crops after the establishment of the association. The cooperative attempted introduce good seeds quality (improved seeds) that gives more yield in a relatively short period beside introduction of new crops. The farmers although they are familiar with these crops, they are not planting it. Furthermore, all the respondents confirmed that the cooperative enhanced the resilience of villagers through introduction of social services from the net profit beside maintenance of schools and health care in the village.

Provision of agricultural tools was mentioned by all the respondents as a benefit from the establishment of the forest cooperative. The cooperative managed to provide the simple hand tools for all the farmers free of charge beside provision of heavy machinery for the difficult tasks. Twelve per cent of the interviewed sample mentioned the social consolidation of the relationship between the villagers as benefit gained from the establishment of the cooperative.

The low percent is not a real reflection of the actual social relation among villagers because almost all the villagers are relatives and have good social relations irrespective of the establishment of the cooperative. The benefits gained by the villagers after the establishment of the cooperative represents the gear for development. This fact is supported by the villagers who indicated that their village has become the most attractive village and well known due to the existence of the agricultural cooperative. This agrees with (FAO, 1989b) Commercial plantations can provide both direct and indirect employment opportunities for some rural people. Forest, on the other hand, provide a source of income and employment for many families who depend
on money earned from gathering, selling, and processing forest products to buy Food and other basic necessities. Also agree with (Burch and Grove, 1993) who indicated that 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 showed that social forestry has the following components.

5.4. Objectives of forestry cooperative establishment

When the people of ELdoom village planned for the establishment of the forest cooperative as one of the activities of ELdoom agriculture cooperative in the village some objectives were in their minds and they managed to make these objectives a reality. Table (5.4) shows the objectives of the forest association as perceive by the villagers.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>incomes generation %</th>
<th>Firewood %</th>
<th>Fodder %</th>
<th>Soil protection %</th>
<th>For recreation %</th>
<th>Other %</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-33</td>
<td>21</td>
<td>19</td>
<td>42.9</td>
<td>47.6</td>
<td>4.8</td>
<td>42.9</td>
<td>19</td>
</tr>
<tr>
<td>34-49</td>
<td>15</td>
<td>20</td>
<td>33.3</td>
<td>73.3</td>
<td>6.7</td>
<td>73.3</td>
<td>26.7</td>
</tr>
<tr>
<td>49-65</td>
<td>8</td>
<td>12.5</td>
<td>50</td>
<td>37.5</td>
<td>0</td>
<td>50</td>
<td>12.5</td>
</tr>
<tr>
<td>&gt;65</td>
<td>6</td>
<td>50</td>
<td>33.3</td>
<td>50</td>
<td>16.7</td>
<td>83.3</td>
<td>33.3</td>
</tr>
<tr>
<td>Total%</td>
<td>50</td>
<td>11</td>
<td>20</td>
<td>27</td>
<td>3</td>
<td>29</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>22</td>
<td>40</td>
<td>54</td>
<td>6</td>
<td>58</td>
<td>22</td>
</tr>
</tbody>
</table>

Twenty-two percent of the interviewed sample asserted that the major aim of the forestry in the study area cooperative is to maximize income generation from the cooperative through addressing forestry activities, while 6% verified the establishment of the forest association merely for the protection of the agricultural lands against wind erosion and consequently increase agricultural crops productivity. This is a new trend and increasing emphasis on poverty alleviation and livelihoods improvement in forestry, representing both a challenge and an opportunity. This trend shows the way forestry can contribute to livelihoods improvement. It focuses on the contributions of
forest products and markets, questioning the typical timber vs. non-timber dichotomy.

The role and the potential of a forest product is determined more by the socio-economic and environmental context of the production, processing and marketing system than by the physical characteristics of the product itself. This is important as new opportunities arise through increased control of resources by local people and new markets for forest products. Helping achieve poverty alleviation through forestry requires poverty mitigation functions, enhancing income and employment options, and taking advantage of opportunities to build and strengthen local institutions through policies and project-level interventions.

This may verify the arrangement of trees in the agricultural lands which take the form of windbreaks or live fence in the study area as assuredly the entire interclass sample. While 58% of the respondents stated that the objective behind the adoption of tree planting intervention is to increase the aesthetic value of the study area and create a new site for recreation. It worth mentioning that the villagers have to travel long distances to enjoy the beauty of the green cover at EL Faki Hashim and similar places. Therefore, villagers planned for establishment of recreational site. Forty percent of the villagers stated that the mere objective behind the establishment of the forest cooperation is to provide firewood to the villagers. Fifty-four per cent stated that provision of fodder for their animals is one of the objectives behind the introduction of forestry activity in the forest cooperative activities. Some respondents mentioned other objectives behind the establishment of the forest association.
5.5. Partners in the establishment of the forestry cooperative in the study area

In the study area it seems that different efforts and collaboration was made for the establishment of the forest association. Table (5.5) shows the different stakeholders in the establishment of the association.

**Table (5.5): Different stakeholders in the establishment of forestry association**

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Collaboration with fnc</th>
<th>Participation with committee</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-33</td>
<td>21</td>
<td>95.2</td>
<td>95.2</td>
<td>85.7</td>
</tr>
<tr>
<td>34-49</td>
<td>15</td>
<td>100</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>49-65</td>
<td>8</td>
<td>100</td>
<td>100</td>
<td>75</td>
</tr>
<tr>
<td>&gt;65</td>
<td>6</td>
<td>100</td>
<td>100</td>
<td>83</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>49</td>
<td>49</td>
<td>41</td>
</tr>
<tr>
<td>%</td>
<td>100</td>
<td>98</td>
<td>98</td>
<td>82</td>
</tr>
</tbody>
</table>

The local institutions illustrate the capacity and creativity of people to create institutions that effectively serve their needs. They are all positive examples of what can happen when people have, or are supported to take, control of their own lives in order to solve the problems they are facing. But it also raises, and leaves unanswered, many questions concerning the possibilities to work with and through local institutions as a more effective strategy for achieving sustainable natural resource management. The relevance of such a strategy is obvious as these local institutions embody the local knowledge that has evolved in culturally and ecologically specific situations. They are the creations of the people themselves who, because they are dependent on their natural resources for their survival, are most interested in maintaining them. But they do not provide a simple clear cut solution.

The changes occurring in the world put heavy demands on these institutions and not all have been, or are able, to adopt. Nor are all suitable for reaching the goals of equity that may consider being so important.

The above table shows that the forest cooperative was established through collaboration of villagers with the FNC where 98% of the interviewed sample
asserted that the FNC played a significant role in the establishment of the association. The FNC provided the villagers with seedlings for the afforestation program besides provision of the technical staff for coaching the villagers for tree planting.

This agrees with Ramli (2008) showing that the FNC played a major role in the establishment of the gum producers associations by promoting the formal structuring of farmer groups into registered Farmers’ associations. The initial associations comprised farmers whose income derived predominantly from the production and sales of gum Arabic. The project of restocking of gum belt assisted the establishment and effective implementation of twenty Farmers’ Associations by the end of 1994. Moreover FNC established additional twelve associations after termination of the project until 2001.

A similar percentage of the respondents (95.2%) stated that the association was established through sensitization of the local people to participate in the program activities. Accordingly, a separate committee was formulated to tackle the issue of forest association. Eighty-two per cent of the interviewed sample asserted that there are some other stakeholders who played significant role in the initiation of the forest association.

5.6. Assessment of local people participate in association’s activity
Any integrated development program of forestry has to have a significant component of developing strategy for achieving people’s participation (Mathora, 1985) Genuine participation can be encouraged by different ways, such as: exercise timing by being at the right time at right place; to go to the people and live with them, learn from them, plan with them, start with what they know, build on what they have, develop isomorphism participation which is similar to genuine participation, develop a philosophy of diversity and choice in the project or program with consideration to people needs; plan with flexibility; develop a rural network which concentrates on practical
experience, and lesson learnt; adopt the role of project management as conveyance, catalyst colloquies and a messenger (Mlenge, 1991). In the study area the respondents assessed the level of participation differently. Table (5.6) shows the stage of participation for the establishment of the forest.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Excellent</th>
<th>Good</th>
<th>Bad</th>
<th>Fair</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-33</td>
<td>21</td>
<td>14.3</td>
<td>9.5</td>
<td>14.3</td>
<td>52.4</td>
</tr>
<tr>
<td>34-49</td>
<td>15</td>
<td>20</td>
<td>6.7</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td>49-65</td>
<td>8</td>
<td>12.5</td>
<td>25</td>
<td>12.5</td>
<td>62.5</td>
</tr>
<tr>
<td>&gt;65</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>16.7</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>7</td>
<td>5</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>%</td>
<td>100</td>
<td>14</td>
<td>10</td>
<td>16</td>
<td>56</td>
</tr>
</tbody>
</table>

Fourteen percent of the interviewed sample assessed the participation of the villagers in the forestry cooperative as excellent. The majority of the respondents evaluated the participation as fair (56%), where 16% assessed it as bad or poor participation. Ten per cent of the interviewed villagers assessed the participation of the villagers in the forest association as good. From the above findings it is apparent that the level of local people participation lagged far beyond expectations where the majority stated that there either no participation or poor participation of the local people.

This situation reflects the importance of extension services which raise the awareness and change the attitudes of clients towards the environment, and accordingly the level of participation will increase. This agrees with (Mohamed et al., 1995) who stated that the extension has the potentiality to make psychological, technical, economical, social and political changes that favor the atmosphere for the participation of local people.
5.7. Women participation in forestry cooperatives

In the study area women had some roles to play in the forest association. On the other hand age groups are of great importance when planning for developmental projects. Some activities are age group specific i.e. can best be done with a certain age group (children or youth or old).

Table (5.7) shows the involvement of women and children in forest and their position.

<table>
<thead>
<tr>
<th>N</th>
<th>Age</th>
<th>Participation %</th>
<th>Women &amp; children participation %</th>
<th>Type of participation %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Voluntary</td>
<td>Paid</td>
<td>Irrigation planted</td>
</tr>
<tr>
<td>21</td>
<td>18-33</td>
<td>4.8</td>
<td>95.2</td>
<td>23.8</td>
</tr>
<tr>
<td>15</td>
<td>34-49</td>
<td>6.7</td>
<td>93.3</td>
<td>6.7</td>
</tr>
<tr>
<td>8</td>
<td>49-65</td>
<td>0</td>
<td>100</td>
<td>12.5</td>
</tr>
<tr>
<td>6</td>
<td>&gt;65</td>
<td>0</td>
<td>100</td>
<td>16.7</td>
</tr>
<tr>
<td>50</td>
<td>Total</td>
<td>2</td>
<td>48</td>
<td>8</td>
</tr>
<tr>
<td>100</td>
<td>%</td>
<td>4</td>
<td>96</td>
<td>16</td>
</tr>
</tbody>
</table>

Being a social construction, gender is a very fluid concept. It changes not only over time, but also from one culture to another and among different groups within one culture. Therefore, gender roles, inequities and power imbalances not a ‘natural’ result of biological differences, but are determined by the systems and cultures in which we live. This means that we can address and contribute to changing these roles by challenging the status quo and seeking social change (Cernea, 1992).

The finding of the above table focuses on the gender and age groups the other table that tackles the issue of participation in the forestry cooperative. Only 4 of interviewed sample asserted that the participation of the villagers in the forest association activities is voluntary. This disagrees with Mangaala (1991) who define participation as voluntary involvement of local people in activities that reshape their future. The rest of the respondents stated that the
participation of the villagers was like waged labor. The association arrived at informal contract on the base of peace work with villagers in correspondence of assigned money. This pitfall may be attributed to the lack of specialized extension unit that can mobilize the villagers and organize them to conduct the different activities voluntarily. However, 16% of the respondents asserted that women and children participated actively in the association interventions. Women and children participation was confined to certain activities.

The entire interviewed sample asserted that women and children participated in the activity of irrigation of plantations because this activity suits their physical fitness and potentialities. Ninety-two per cent showed that women and children participated in terraces construction for water harvesting and minimizing watering of the plantations. As far as seedlings production is concerned, only 10% of the respondents accentuated that women and children participated in the activity of seedlings rearing. Seedlings were provided by the FNC, women and children take care of the seedlings until they transplanted to the field.

From the above findings it is clear that the participation of women and children is limited to certain activities. Even for these activities the level of participation is very low. This draws the attention of the importance of the extension unit which can plan and design extension messages that encourage women and children to participate almost in all the interventions of the forestry cooperative. This is line with (Bochet, 1983) showing that 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 committed participation. (Mohamed, 1995). Confirmed that 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.

It is important to recognize that, even though women are often at a disadvantage to men when it comes to access to natural resources, this access varies enormously from context to context and it is impossible to generalize. On the other hand, it is clear that deforestation affects women in particular since they are primarily responsible for collecting firewood, water and numerous forest products. Having to travel longer distances for gathering and employing more time and energy to find water and fetch wood has a negative impact on other activities they could undertake to earn income or simply have free time.

5.8. Management of ELdoom forest cooperative

Table (5.8) shows the attitude towards the management of the forest association. The Forestry Cooperatives, which are non-governmental forest organizations, play important roles in implementing the forest owner's activities.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Management body%</th>
<th>Seedling %</th>
<th>Incentives %</th>
<th>Seedlings transport %</th>
<th>Working group %</th>
<th>Silvicultural treatment %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Elected committee%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-33</td>
<td>21</td>
<td>38.1</td>
<td>19</td>
<td>19</td>
<td>14.3</td>
<td>33.3</td>
<td>0</td>
</tr>
<tr>
<td>34-49</td>
<td>15</td>
<td>80</td>
<td>0</td>
<td>26</td>
<td>33.3</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>49-65</td>
<td>8</td>
<td>100</td>
<td>0</td>
<td>37</td>
<td>25</td>
<td>37.5</td>
<td>12.5</td>
</tr>
<tr>
<td>&gt;65</td>
<td>6</td>
<td>83.3</td>
<td>16.7</td>
<td>16.7</td>
<td>50</td>
<td>16.7</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>33</td>
<td>5</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>66</td>
<td>10</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>2</td>
</tr>
</tbody>
</table>

Forestry cooperatives can pool the resources of forest landowners to improve the condition of the landscape, add value to local forest products, and promote the region’s economic development. For example, the Sustainable Woods Cooperative of southwestern Wisconsin combines its members’ certified
forest management with a cooperative ownership structure for sales of certified wood products from members’ forests. They collaborate with two other cooperatives: the Hiawatha Sustainable Woods Cooperative and the Kickapoo Woods Cooperative. Together they form the largest forest cooperative in the Midwest (http://www.nemw.org/forestecon.pdf). This situation necessitates the existence of efficient management of the forestry cooperative. The goal of forestry cooperatives is to manage their forest rationally by enlarging management scale through cooperating production elements such as forest land, labor, and capital of the small-scale private Forest owners, and to improve the socio-economic position of the members (FAO, 1996).

As far as the management of the association forest is concerned, the majority of the respondents stated that there is a selected committee consists of five members from the cooperative are responsible for the management of the forest, while 24% believe that there is no specified committee for the management of the forest and all the managerial activities are conducted by the ELdoom Agricultural cooperative cooperation. However, proper forestry management methods whose objective is to conserve and utilize forests are linked to the existence of an adequate and efficient management unit. Growing pressure on forests for recreational activities also result in increased involvement of the general public and demands for a forestry access road network able to handle these multiple uses.

These activities necessitate the importance of existence of independent committee to follow all the needs of the forest. This may verify the importance of the formation of forest committee from the members of the association to follow the different activities of the program. Activities of the cooperative committee reflect the tasks tackled to the members of the committee. Twenty-six per cent of the interviewed sample asserted that one of the main tasks of the committee is to transport seedlings from the FNC
central nurseries to the village. Ten percent of the respondents accentuated that one of the tasks of the committee is to distribute the seedlings to some women and children to take care off (protection and irrigation) until the time of their planting.

Some respondents (24%) stated that one of the roles of the forestry cooperative is to prepare and fetch incentives to guarantee participation of the villagers in the forestation program, while 28% emphasized the role of the association in the creation of working groups according to gender and age. Two per cent stated that one of the tasks of the management committee of the cooperation forest is to conduct the silvicultural treatments at the right time for the growing plantations. On the other hand (FAO, 1999) showed that for Public demands for the social and environmental services of forest as well as for products will continue to increase and diversify. Therefore, the widening perception of the importance of forests and their role in the environment and the economy is becoming increasingly a matter of public debate.
5.9. Services and products obtained from the forest association

In the study area there are some services and products expected to be gained from forest. Figure (5.2) shows if there is any forest product from the cooperative forest and what is the kind of the product.

![Figure (5.2): services and products obtain from the association forest](image)

There are four types of services that cooperative could provide for the members. The first one is in the area of marketing. The second is a supply cooperative. That's where a group might band together to purchase various goods. A third example would be providing some type of service. In this case, it might be providing some kind of professional forestry service. The fourth and last one, it’s probably very present in this current, new wave of cooperatives, is the idea of education. Co-ops provide their members an education about forestry. Not only going to a field day, but actually going out and trying to do some of these practices on the ground, that's another way they help their members become better managers of the land (Keyworth, 1994).
Twenty per cent of the interviewed sample asserted that the experience of the forestry cooperative considered as brand new and it is very early to assess the products it provides to the villagers. Thirty per cent stated that there are some tangible benefits from the cooperative forests like provision of grazing areas for the livestock of the villagers where almost all the households in the study area have domestic animals that subsidize the income of the families. Twenty-eight per cent showed the association forest provides round timber which is used commercially to finance the ELdooom Agricultural cooperative. Therefore, it could be consider as a source of income to the villagers. About 4.2% appreciate the environmental role of the forest and the role of the forest in protection of agricultural fields against wind erosion and desertification.

From the above findings it is clear that the forest provides the villagers with some services and products. This agrees with FAO (1999) showing that public demands for the social and environmental services of forest as well as for products will continue to increase and diversify. Therefore, the widening perception of the importance of forests and their role in the environment and the economy is becoming increasingly a matter of public debate. Moreover, FAO (1999) showed that there is an increasing interest in strengthening or creating collaborative management systems as a strategy for promoting socio-economic development and resource conservation through empowerment and partnerships.

5.10. Prospects of forestry cooperative as perceived by villagers
The total area of the plantations in the study area is fragmented into many compartments and small forests. Villagers were inquired to know the sustainability of the activity and its development. Table (5.9) shows the possibility of increasing the plantation area as perceive by the villager.
Findings of table (5.9) show that the majority of the villagers (88%) expressed the possibility of expanding the forest area since there are some unexploited parcels of lands. Moreover, members of this group call for utilization of all bare areas unsuitable for agricultural production in tree planting programs. On the other hand 12% asserted that it is not possible to expand the forest area because the land tenure system in the study area is very complicated, and they believe that the afforested area is quite enough to meet the objectives behind the establishment of the plantations.

The majority of the respondents in the study area (96%) stated that the rotation of the plantation is determined by the (FNC) and the role of the forest committee is to consult the (FNC) for the right time of timber harvest. The marketing of the products is usually undertaken by the forest committee. Only 4% asserted that the harvest is usually take place without consulting the (FNC).

The entire interviewed sample asserted that collection of dead branches and dead trees as firewood is considered as a privileges for the villagers from the forests, while 6% consider collection of round timber for constructional purpose should be consider as a privilege. The majority of the respondents stated that the forest cooperative was established to meet certain objectives. Accordingly, there are no any privileges for the villagers in the study area.
5.11. Distribution of benefits from the forestry cooperative

Therefore, one of the most important factors that jeopardizes the sustainability of the activity is social distribution of benefits, which is insufficient due to conventional, forest management objectives and administration practices (FAO, 1989a). Table (5.10) shows the returns obtain from cooperative of forest and how distributed.

Table (5.10): Distribution of benefits in study area

<table>
<thead>
<tr>
<th>N</th>
<th>Return of forest%</th>
<th>The development from forest return%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Communal Individual benefits</td>
<td>Increase agric area</td>
</tr>
<tr>
<td>21</td>
<td>95.2</td>
<td>4.8</td>
</tr>
<tr>
<td>15</td>
<td>86.7</td>
<td>13.3</td>
</tr>
<tr>
<td>8</td>
<td>62.5</td>
<td>37.5</td>
</tr>
<tr>
<td>6</td>
<td>66.7</td>
<td>33.3</td>
</tr>
<tr>
<td>50</td>
<td>42</td>
<td>8</td>
</tr>
<tr>
<td>100</td>
<td>84</td>
<td>16</td>
</tr>
</tbody>
</table>

Obstacles to participation in community forestry program will result in the failure of any afforestation project. These obstacles can arise from diversity of attitudes and interest among the concern population due to social stratification, administrative resistance to decentralization and redistribution of benefits; difficulty in creating a new soul of participation among the previously uninvolved population (Ahmed, 1982).

The majority of the respondents (84%) stated that the benefits gained from cooperative forest are utilized for the benefit of the whole community. The rest of the respondents 16% indicated that under certain conditions some benefits are distributed on an individual basis. The exploitation of returns for the development of the community takes different forms. Eighty-six per cent of the interviewed sample stated that the returns from forests are used for increasing the agricultural land through reclamation of denuded areas within the area of the agricultural cooperative. Eighty-four per cent of the respondents stated that returns from the forest is used for paying the bill of
electricity across the whole year, while 16% showed that the benefits gain from the association forest is used in the maintenance of the schools in the villages.

From the above findings it is apparent that there are returns from the association forest which is used for community development or distributed to individuals under certain conditions like theft or loss of property due to fire incidence. This agrees with David. (1993) finding and holding market share seems to be one of the critical factors determining the feasibility of establishing or expanding any enterprise in specialty wood products.

5.12. Land tenure system in the study area

In the study area there is a different type of land tenure. Table (5.11) shows the types of land Tenure and if any action plan for sustainable management forest cooperative.

Table (5.11): land tenure and the selected trees for the plantation

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Land tenure%</th>
<th>Plan For sustainable Management%</th>
<th>Selection of eucalyptus%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Government</td>
<td>Communal</td>
<td>Economic</td>
</tr>
<tr>
<td>18-33</td>
<td>21</td>
<td>95.2</td>
<td>4.8</td>
<td>100</td>
</tr>
<tr>
<td>34-49</td>
<td>15</td>
<td>80</td>
<td>20</td>
<td>93.3</td>
</tr>
<tr>
<td>50-65</td>
<td>8</td>
<td>87.5</td>
<td>12.5</td>
<td>78.5</td>
</tr>
<tr>
<td>&gt;65</td>
<td>6</td>
<td>83.3</td>
<td>16.7</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>44</td>
<td>6</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>88</td>
<td>12</td>
<td>96</td>
</tr>
</tbody>
</table>

Wilkens (1978) stated that under the conditions of inheritance, the ownership is subjected to changes in a form of reduction in land size and as a result trees have to be cleared to provide a vacant lot for the family. In most of the rural areas of the Sudan the land tenure is of customary land tenure in which the allocation of the land is made up by the traditional leader.
The majority of the respondents (88%) stated that the type of their land tenure is governmental where all the land belongs to the government and allocated either for living or for agricultural projects, while 12% stated that their land tenure is communal and the land is inherited from descendants.

As far as the sustainability of the activity is concerned, the majority of the respondents assured the presence of a plan that guarantee the sustainable management of the resource. This plan was formulated by expert foresters as a consultancy in which selective felling is the main system of tree harvest. It worth mentioning that, eucalypts tree species was selected for the afforestation program. The main criteria for the selection of eucalyptus for the afforestation are economic feasibility and environmental role as perceive by the respondents. Ninety-six per cent stated that financial returns are the main criterion for the selection of eucalyptus. This species has the potentiality to meet the objective of the cooperative because the tree is fast growing species and has a good market demand. Scale plantations have been raised in government owned and private farm lands; the planting is continuing. There is vast potential to grow the species economically on farm and waste land in suitable zones. Eucalypt meets requirements of people and industries and has helped to reduce pressure on natural forests. The uses of eucalypt are varied; people are realizing this fact. The economical, social and ecological aspects of the species are receiving proper attention to understand its impact and to avoid indiscriminate planting.

5.13. Limitations and measures of risks confronting the association

In the study area the respondents were asked to figure out the main problems confronting forestry association. Table (5.12) shows the main problems confronting tree planting and development of forestry association in the study area.
Abare (1995) showed that it is expected that by being aware of the various techniques in forest development and the methods of encouraging community participation, the trainees could develop more confidence and increase belief in the idea that a more rapid forest development can be attained. The reasons for conducting training should be given in the rationale, and the problems should be identified as well as how the training can solve them.

Thirty-two per cent of the interviewed sample asserted that there is no governmental commitment towards the idea of forestry cooperative where there are no incentives or subsidies or loans for sake of developing such a cooperative across the country. A similar per cent of the respondents (4%) mentioned lack of scientific management of forestry cooperative in the study area where most if not all the members have no forestry background and they rely on their agricultural experience on conducting forestry activities. Two per cent of the interviewed sample mentioned irregular supply of electricity services have a negative impact on the development of the activity particularly irrigation of the plantations. Eight per cent stated that the level of participation lag far beyond the ambition and the drawbacks is represented in the assignment of the activities on certain group. Fourteen per cent stated that there is no training for sake of dissemination of information or transfer of technical know-how. This in turn shows the lack of involvement of related

Table (5.12): Measures of risks confronting forestry association in the study area

<table>
<thead>
<tr>
<th>Age</th>
<th>No government support</th>
<th>Shortage irrigation</th>
<th>Management constraint</th>
<th>Poor participation</th>
<th>No training</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-33</td>
<td>33.3</td>
<td>0</td>
<td>23.8</td>
<td>4.8</td>
<td>23.8</td>
</tr>
<tr>
<td>34-49</td>
<td>15</td>
<td>33.3</td>
<td>6.7</td>
<td>33.3</td>
<td>6.7</td>
</tr>
<tr>
<td>49-65</td>
<td>8</td>
<td>25</td>
<td>0</td>
<td>50</td>
<td>12.5</td>
</tr>
<tr>
<td>&gt;65</td>
<td>6</td>
<td>33.3</td>
<td>0</td>
<td>33.3</td>
<td>16.7</td>
</tr>
<tr>
<td>Total %</td>
<td>50</td>
<td>1</td>
<td>16</td>
<td>32</td>
<td>7</td>
</tr>
</tbody>
</table>

Abare (1995) showed that it is expected that by being aware of the various techniques in forest development and the methods of encouraging community participation, the trainees could develop more confidence and increase belief in the idea that a more rapid forest development can be attained. The reasons for conducting training should be given in the rationale, and the problems should be identified as well as how the training can solve them.

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institutions in the activity of forestry cooperative. It is expected that the (FNC) has to give hand in order to mobilize and sensitize the villagers to participate in the activity of forestry cooperative.

From the above findings it is apparent that forestry cooperative in the study area is confronted by series of constraints and problems which need considerable effort to enhance solving of these problems in order to make the study area as a vital example of executing forestry cooperatives in the capital and the country as whole. Problems of forestry cooperative in the study area is completely different from that in North Kordofan State, as viewed by Ramli (2008), where the main problems confronted gum Arabic associations are, migration, complicated procedures of registration of the association.

### 5.14. Extension services in the study area

Extension services are needed to play a major role in the promotion of tree planting through active peoples’ participation and to ensure sustainability of the active involvement of the people in the development and management of the planted trees. Table (5.13) shows the situation of forestry extension in the study area.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Extension Message %</th>
<th>Field of extension Messages%</th>
<th>Source of extension%</th>
<th>Environmental issues%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Awareness raising</td>
<td>Joint management</td>
<td>FNC</td>
</tr>
<tr>
<td>18-33</td>
<td>21</td>
<td>81</td>
<td>85.7</td>
<td>14.3</td>
<td>95.2</td>
</tr>
<tr>
<td>34-49</td>
<td>15</td>
<td>60</td>
<td>86.7</td>
<td>13.3</td>
<td>93.3</td>
</tr>
<tr>
<td>49-65</td>
<td>10</td>
<td>100</td>
<td>100</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>&gt;65</td>
<td>6</td>
<td>100</td>
<td>100</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>40</td>
<td>45</td>
<td>5</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>80</td>
<td>90</td>
<td>10</td>
<td>93</td>
</tr>
</tbody>
</table>

The results indicate that the overall communication between forestry extensionists and farmers should not be sporadic and limited. Moreover, the forestry extensionists should not spent the bulk of their time in and around
their central nurseries, caring for seedlings and only brief interaction occurred during village visits for farm selection and seedlings deliveries. There was no sound extension work for the dissemination of the achieved scientific information and up-to-date technology in the study area. There is much to be done with forestry program depending largely on effective people's participation at various stages of implementation.

The present study perceives that international agencies and NGOs which have operated and/or coming to operate in the Sudan need to critically examine their methods of assistance and the effectiveness of their efforts in promoting community participation. They need to consider ways of equipping themselves to face the mounting challenge of ensuring genuine participation for the country as whole.

The majority of the respondents (80%) stated that there is extension services directed towards them in the form of extension message. Ninety per cent of the interviewed sample accentuated that the contents of the extension message focuses on awareness rising with special emphasis on ecological awareness (importance of trees and the negative impacts of deforestation). Ten per cent of the interviewed sample stated that the extension message dealt with the adoption of joint management intervention. The respondents in the study area mentioned different sources of forestry extension, namely; (FNC), as mentioned by 93% of the respondents and 4% stated that the extension services in the study area are conducted by NGOs. Irrespective of the source of the extension services, the majority of the respondents (98%) stated that the main theme of the extension service is dealing with environmental issues

5.15. Proposals for resolving constraints confronting forestry association

In the study area the respondents mentioned different suggestions that could contribute to the development of the forest association in the study area. Table (5.14) shows the proposals of the respondents regarding finding
solutions to problems confronting the activities of forest association in the study area.

Table (5.14): The proposals of the respondents

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>To avoid the limitation%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Government support</td>
</tr>
<tr>
<td>18-33</td>
<td>21</td>
<td>4.8</td>
</tr>
<tr>
<td>34-49</td>
<td>15</td>
<td>6.7</td>
</tr>
<tr>
<td>49-65</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>&gt;65</td>
<td>6</td>
<td>16.7</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>1</td>
</tr>
<tr>
<td>%</td>
<td>100</td>
<td>6</td>
</tr>
</tbody>
</table>

To promote the association activity for the welfare of the stakeholders and the area as whole, problems confronting the development of the forestry cooperative should be taken care of and reasonable and feasible solutions should be sorted out.

Thirty per cent of the interviewed sample asserted that provision of steady supply of electricity services would guarantee regular irrigation of plantation which will be reflected in the increase of the green area in the state, while 14% stated that establishment of monitoring and evaluation unit within the managerial structure will enhance the development of the plantations where any need for beating up or enrichment of the plantation can be detected early through assessing the mortality percentage.

Six per cent of the interviewed sample emphasized the importance of involvement of governmental institutions for the development of the activity and its wide spread across the whole state, while 4% stated that the importance of scientific knowledge is of a paramount importance in the development of forestry cooperative activities in the study area. The importance of government institutions is highlighted by Oregon Legislature which in 1993 established the Forest Resource Trust.
The legislature created the trust based on the recommendations of bankers, forestry analysts, private forestland owners, environmental organizations and public agencies. Lands reforested through the Forest Resource Trust provide many environmental, social and economic benefits to Oregon such as soil conservation, clean water, fish and wildlife habitat, future timber availability, scenic quality, job opportunities and recreation (Oregon forest recourse, 2009.). Some respondents mentioned the importance of sensitizing and mobilizing the youth of the village through application of the agenda of incentives and subsidies. These agree with Davis-case (1989) showed that social forestry has the following: compo Woodlots in areas which are short of forest products for local needs; growing of trees at the farm level to provide cash crops (agro forestry) processing forest products on the household and small industry level to generate income in the community; governmental support to make high way and canal plantation. Windbreaks and shelterbelts to provide protection to the productive lands
6.1. Conclusions

- It is clear that the level of education of the respondents is relatively good and this could be attributed to the availability of schools services in the study area.

- The villagers are farmers and they are the real owners of their farms, while the some of the respondents stated that they are farmers but the land tenure is governmental property.

- Cooperative forest is among the activities that supports the income of some respondents. Similar to the tree farm system that encourages private forest owners to actively manage their forests in a sustainable manner for multiple values.

- Conditions for the membership of the cooperatives, among which are; to be of an age equal or greater than 18 years, to be a permanent resident of the village, commitment to all instructions and guidance provided by the association, and possess enough experience in farming beside the good reputation.

- The forestry cooperative contributed significantly to diversification of income generation beside other benefits. All the respondents asserted that the income generation increased dramatically after the establishment of the association. Moreover, all the respondents stated that there is great diversification of agricultural crops after the establishment of the association.

- The associations attempted to introduce good quality seeds (improved seeds) that give more yields in a relatively short period beside introduction of new crops the farmers although they are familiar with, they are not planting it. Through introduction of social services from
the net profit beside maintenance of schools and health care in the village.

- The main aim of the forestry cooperative is to maximize income generation from the association through addressing forestry activities, as well as the protection of the agricultural lands against wind erosion and increasing agricultural crops productivity.

- The forest cooperative was established through collaboration of villagers with the FNC which played a significant role in the establishment of the forestry cooperative. The FNC provided the villagers with seedlings for the afforestation program besides provision of the technical staff for coaching the villagers for tree planting.

- The forestry cooperative was established through sensitization of the local people to participate in the program activities. Accordingly, a separate committee was formulated to tackle the issue of forest association.

- Management of the forestry cooperative forest is examined and the majority of the respondents stated that there is a selected committee consists of five members from the association responsible for the management of the forest.

- Assessment of local people participation in the association's activities showed that level of participation in the association is mostly fair and good sometimes.

- Women and children participation was confined to certain activities. They participate in the activities of irrigation of plantations and terraces construction for water harvesting and minimizing watering of the plantations.

- The benefit share assessment showed that benefits gained from association forest are utilized for the benefit of the whole community. Returns from the forestry cooperative forest which is used for community development or distributed to individuals who have
problems under certain conditions like theft or loss of property due to fire incidence.

- Land tenure assessment showed that the type of land tenure is governmental where all the land belongs to the government and allocated either for living or for agricultural projects.

- For sustainability of the activity the majority of the respondents assured the presence of a plan that guarantee the sustainable management of the resource. This plan was formulated by expert foresters as a consultancy in which selective felling is main system of tree harvest. It worth mentioning that, eucalypts tree species was selected for the afforestation program.

- The contents of the extension message focuses on awareness raising with special emphasis on ecological awareness (importance of trees and the negative impacts of deforestation) and adoption of joint management intervention.

- Problem facing forestry cooperative are lack of government commitment, lack of scientific management of forestry cooperative, and irregular supply of electricity services.

- The level of participation lag far beyond the ambition and the drawbacks is represented in the assignment of the activities on certain group. Lack of training for sake of dissemination of information or transfer of technical know-how.

6.2. Recommendations

- Extension services are needed to play a major role in the promotion of tree planting through active peoples’ participation and to ensure sustainability of the active involvement of the people in the development and management of the planted trees.

- There have to be particularly government particulars in the side of electricity and water.

- The (FNC) must concentrate on extension massages importance of the forest from the ecological, economical and beautification.
- Teaching the farmers the techniques of establishing seedling by themselves.
- Woman and children should be encouraged to participate in management and establishment of the forest.
- There have to be concentration on training where all the respondents on study area are ready to contribute in the forest activities to facilitate and protect their farms.
- Increasing the forest area which leads to increase in the products, green area and sustainable development.
- To investigate the measures of risks and constraints confronting the association forest in the study area.
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Appendix (1)
Coquesionnaire

This questionnaire was made to collect information about the role of co-operative forest in increase the green area through forestry activates, case study East Nile in aljilly area. The information will be used in research for M.Sc. degree. Place answer the following question as accurately as possible. Where actual data are not available please use your closet estimation. Your answers will be strictly confidential.

1- Age ........................................

2- Educational level
   1-Ilittrate .................  2-Khalwa...........  3-Primary school........
   4-Intermediate school...........  5- higher secondary school........
   6- University.................

3-Occupations
   1-Farmer ............  2-farm owner.....  3- governmental employ........
   4- other................................

4-What is the date of establishment of association?

.................................................................

5-What are the rules of membership to association?

.................................................................

6-from where the origin of association becomes?

.................................................................

7-What is the benefited of the idea of establishment association?

.................................................................

8-What is limitation idea of association?

.................................................................

9-What you do to avoid the limitation?
10-What is the date of forest idea?

11- What is date of the establishment of the forest?

12–By who do the forest has been established?

1- In collaboration with fnc……… 2- participation with committee

3-other ........................

13-What the reasons of forest establishment?

1- For income generation………………… 2- For production agric land

-For recreation…………………….4- Pastoral land……………………

5-Feul wood……………………..6- Other……………………………………

(Specify)…………………………

14- What is the level of the participation of the respondents?

15- Is participation of the forest establishment?

1-Voluntary…………………… 2- Paid………………………………

16-Are women and children participate in forest establishment?

1-yes…………………… 2- No………………………………

17-If the answer yes what kind of participation they do?

18- If there any participation from committee how distribution the position to managed the forest?

19- What is forest usage?
20- The responsibility of the forest management
   1- Association ………… 2- Selecting committee…………………………
21-What is the mission to association to managed forestry?
   …………………………………………………………………………………
22- If there any increase area to the forest?
   …………………………………………………………………………………
23- The rotation of the forest
   1- FNC ……………………………..  2- Observation ……………………
24- What are privileges to participation from forest products?
   …………………………………………………………………………………
25- Is there any process from forest products?
   …………………………………………………………………………………
26-Is there any marketing forest products?
   …………………………………………………………………………………
28- If yes what is the kinds of products?
   1- Fuel wood ………………. 2- Construction materials………………
   3- Fruits………………
29- What is the rang of benefits from returns of forest?
   1-Communal ……………….2- Individual benefits…………………..
30-Is there any developments from this return?
   1- Yes ………………………….2- No……………………………..
31- If the answer yes what is these developments?
   1-Increas the agriculture land….. 2- Schools…… 3. Electricity………. 
   4-Other…………………………
32- What is the type of the land tenure?
   1- Government……….. 2-Communal……….. 3- Rent …………………
   4- Individual…………………………
33- Is there any working plane to sustainable forest bid?
1-yes ...................................2 –No........................................

34- If the answer yes who is participate in determination working plan?

..................................................................................................

35-What is reason to the selection the eucalyptus for forest?

1- Ecinomic …….. 2- Environmental……… 3- Fast growing………..

36- Is there any extension massage?

1-yes.............................2- No............................

37- If the answer yes explain the field of extension?

1- Awarness rising………………2-Jiont management………………

3-Technical advice………………

38-Instatute holds extension programs?

..................................................................................................

39- Is there any desertification of tree cover degradation?

Yes .....................2- No..........................................................

40-What is the relationship between (FNC) and the association?

..................................................................................................