



**Sudan University of Science and Technology**

**College of Graduate Studies**



**Assessing the Roles of the Forest Policies and Laws in  
Achieving Sustainable Forest Management**

**in Eastern Sudan**

**تقييم أدوار سياسات وقوانين الغابات لتحقيق الإدارة المستدامة للغابات**

**في شرق السودان**

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Philosophy (PhD) in Forest Science

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# DEDICATION

To my Parents-May Allah prolong their life.

To my Uncle Eltahir

To my Sprit Brother Nezar

To my ever supporting husband.

To my lovely daughter Leena.

To all my friends every where

I offer this very modest work.

*Tagreed*

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## **ABSTRACT**

The study was conducted in Gaderif State in Eastern Sudan. The objective was to investigate the prevailing forest policies and laws in response to sustainable forest management. Participatory methods of data collection were used included observations, interviews, personal contact, group discussion, and questionnaires. The secondary data was collected from reports, books and scientific journals. Data collected covered information variables related of local communities to socio economic characters, utilization and interaction of forest resources and awareness of local communities of forest laws. Questionnaire was used to obtain relevant information from the sample of 150 households, randomly chosen from three villages around the three forests namely; Elrawashda, Darelzain and Sarf Saaed well involving concerned bodies. Personal contacts and semi structured interviews were carried out with experts and professionals related to forest policy and laws in the natural resources institutions, legislative institutions and non Government Organizations. Additionally a semi-structured questionnaire survey was completed by interviewing 30 experts and professionals to analyze polices and laws and their roles in achieving sustainable forest management in addition to the coordination of polices and laws with other natural resources policies. The collected data were processed and analyzed using SPSS software version 16.

Results of the study revealed that there is a weak participation of local people in forest protection and conservation. The study also showed that improper land use and transformation of forest land by mechanized farming increased deforestation. This is due to lack of coordination between bodies involved in natural resources management. Results revealed that some

difficulties prevent the implementation of the forest laws included low awareness about forests importance and forest laws. Although Sudan government is committed to the international conventions, still lack of funding and coordination between the different responsible authorities existing.

The study recommended that stakeholders and other land users should participate in the policy formulation and development process. Moreover, policy formulation should be based on accurate data base; appropriate policy implementation tools; coordination of efforts for policy formulation. Therefore the study recommended that an overarching body will need to be involved in coordination and mobilization of developing policies and laws of natural resources. It is also study recommended of that natural resources related bodies to adopt formation of forum and raise dialogues towards to bringing up policy issues agenda and sensitize decision makers toward supporting natural resources policies.

## Abstract in Arabic

### الخلاصة

أجريت هذه الدراسة بولاية القضارف في شرق السودان والهدف الرئيسي منها هو دراسة سياسات وقوانين الغابات لتحقيق الادارة المستدامة للغابات في السودان . تم جمع البيانات الأساسية للدراسة من خلال عدة طرق شملت الملاحظات والمقابلات و الاتصال الشخصي ومناقشة المجموعات والاستبيانات. تم جمع البيانات الثانوية من التقارير والكتب والمجلات العلمية. تم جمع بيانات متباينة عن الخصائص الاجتماعية الاقتصادية للمجتمعات المحلية وارتباطات وتداخلات المجتمعات المحلية بمراد الغابات ومعرفتهم بقوانين الغابات . كما تم استخدام الاستبيان للحصول على المعلومات ذات الصلة من عينة تتكون من 150 أسرة تم اختيارها عشوائيا من ثلاث قرى حول الغابات الثلاثة وهي ؛ الرواشدة ، دار الدين، سرف سعيد. كما تم جمع معلومات من الخبراء و المهنيين الذين لديهم علاقة بسياسة وقوانين الغابات في مؤسسات الموارد الطبيعية والمجالس التشريعية والمنظمات الغير الحكومية. تمت معالجة البيانات التي تم جمعها وتحليلها احصائيا.

كشفت نتائج الدراسة عن ضعف مشاركة المجتمعات المحلية في حماية الغابات وحفظها . كما وجدت الدراسة ان إلى اهم الاسباب التي ادت الي نقصان مساحات الغابات وتدهورها هو التوسع الزراعي وذلك يعزى الي عدم التنسيق بين القطاعين المعنيين. كما اوضحت نتائج الدراسة عن وجود بعض الصعوبات التي تحول دون تنفيذ قوانين الغابات مثل عدم وعي المجتمعات المحلية باهمية الغابات. ايضا توصلت نتائج الدراسة الي ان سياسة الغابات في السودان لم يتم اعدادها

باشراك مستخدمى الاراضى فى القطاعات الاخرى والمعنين بامر الغابات والقادة المحليين . كما ان هذه السياسة لم تستند على دراسات دقيقة وكثيرا ما تجاهلت العناصر والاليات الاساسية لتنفيذ هذه السياسة . كما وجدت الدراسة ايضا ان حكومة السودان وقعت على عدد من الاتفاقيات الدولية ذات الصلة بمراد الغابات لكن هذه الاتفاقيات تتقصها الماديات والية التنسيق مع الهيئة القومية للغابات.

اوصت الدراسة بضرورة المشاركة الفاعلة من مستخدمى الاراضى وذوي الشأن المعنيين بأمر الغابات فى صياغة وتنمية سياسة الغابات . كما اوصت الدراسة بضرورة التنسيق بين الادارات المعنية بالمراد الطبيعية وحوكمتها فى جميع الخطوات المطلوبة فى اعداد السياسات والقوانين وانزالها الى ارض الواقع لتشمل اعداد السياسات، نشر الوعي بخصوصها وتفعيل اليات انفاذها والتنسيق بين الجهات المختلفة لادوارها بصورة ايجابية. كما اوصت الدراسة على ضرورة وجود الية منهجية مظللة تعمل على تنسيق ادوار الجهات ذات الصلة وتفعيل المتابعة والتقييم لضمان فعالية السياسات والقوانين المرتبطة بالادارة المستدامة للموارد الطبيعية . على الجهات المعنية بسياسات ادارة المراد الطبيعية خاصة الهيئة القومية للغابات اقامة منتديات واثارة حوارات حول اجندة سياسات المراد الطبيعية ورفع احساس متخذي القرار بهدف تبني ومساندة السياسات الداعمة.



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# **CHAPER ONE**

## **NTRODUCTION**

### **1.1. General**

The Sudan is one of the greatest tropical forests country and rich of natural resources. The natural resources in the Sudan were facing many challenges due to climatic change and human activities such as soil erosion, desertification, drought, seasonal fire, over grazing, clear cutting, drought and mismanagement in addition to agriculture expansion (Elhussein, 2017). Many studies carried out in Sudan agreed that agricultural expansion has resulted in forest cover declined (Idris, 2017). It is worth mentioning the fact that deforestation process in Sudan was aggravated by lack of coordination between land user institutions

Deterioration of natural forest reserves and non-reserves will continue unless proper management is considered (Osman, 2000).The survey of the Global Forest Resources in 2010 showed that forest area has decreased by about 76.4 million hectares in 1990 to about 69.95 million hectares by the end of (2009), which means that the forest cover has declined to about 32% to 29% of the total area of the country after the country separation (Abdalla, 2018).The annual deforestation in Sudan is estimated at 2.4%. Energy consumption is considered as major driver of deforestation (Alneel, 2017). The forest land decreased from 68 million hectare to 21.6 million hectare as a result of separation of South Sudan (UN, 2014 cited by Osman, 2017).This existing forest cover is facing very high pressure & continuous deforestation on legal or illegal basis (Elmadina, 2006). This over exploitation put forest resources in declining state (FAO, 1990). Elsiddig (2004) and Elmadina (2006) stated that from the mid-sixties on wards the degradation of Sudan

forests continued at an alarming rate. Forestland is being lost annually in Southern Darfur, South Kordofan, South Blue Nile and around Elgadaref and Kassala, and in irrigated Schemes particularly in Gezira.

Sudan is one of the first countries in Africa and the Near East, which had an organized forest administration. The Wood and Forest Department, now Forests National Corporation (FNC), was established in 1901. Forests products and services play a crucial role in the economy of Sudan and the life of its people (Abdel Magid and Ibrahim 2003). After that the National Forest Policy in Sudan started early in 1932, with legislation and laws that contained preventive measures to people access and use right to trees and forests. Gradual changes took place through process of amendments that made positive provisions to social forestry development with time (Abdel Magid and Elsiddig, 2002). The forest Policy started to call for sustainable forest management of the forest reserves (Kobbail, 2005).

This study is aiming to investigate the Sudan forest policies and laws in fulfilling condition of sustainability and how they are positively responding to national and international sustainable forest management initiatives.

## **1.2. Problem statement**

Forest policies and legislations are important part of the institutional elements for the expansion of the forest sector. It provides the structural framework within which national forest policies are set and in turn reflect or should reflects their objectives and priorities. It is also an indispensable instrument for the implementation of those policies (Schmithuen, 1986). Policies and legislations set directions and control actions on recourses use; they also specify authorities and relation between different actors. The process of policy making and setting of rules and acts usually imply

different actors including grass root level and also consider different aspects of sustainability. At the same time, many of the countries are in transition from an era of forest exploitation to one of sustainable forest management and production. This change carries with it the need to strengthen all elements of the forestry sector, from public administration to manpower development, resources planning, revenue enhancement, environmental conservation and forest product processing and marketing.

In Sudan most Forest Policies were taken at national level and were determined by national factors, but the international conventions influences the national policies are gaining an importance in the world where national policies are becoming more and more interdependent. Despite The Sudan interests in forest development, protection, and it was therefore established Forests National Corporation (FNC), regulate forest policies and created legislation and laws since long period of time but still there was forest deterioration phenomenon in large areas in the Sudan. This deterioration happen by Man-made activity such as tree cutting in order to meet people demand, furthermore the drought, desert creep, water erosion are causes of forest deterioration (Eisa,1996) and (Abdelmagid and Mohmmmed, 2013).

According to Glover (2005), during the 1980s and 1990s there was a rapid expansion of rain-fed mechanized cultivation with the aim of attaining self-sufficiency in food production.

FAO (2011) reported that about 69,949,000 ha (29.4%) of Sudan is forested. The change in Sudan Forest cover between 1990 and 2010 year an average of 321,600 ha (0.42%) per year. In total, between 1990 and 2010, Sudan lost about 6,432,000 (8.4%) of its forest cover.

Underlying these deforestation driving forces are forest policy failures, external prices of timber, weak institutional structures, and population pressures. A major concern over conservation of forest resources in Sudan is the huge gap between the intentions of national policies and the realities on the ground and the highly skewed power structure which favors the government and the industry on the one hand, but marginalizes the local communities on the other.

Ibrahim (2002) stated that in Sudan forest policy was concentrated on the management of forest reserves under government control to organize the felling, protection, conservation, development and management.

Although both forest policies of 1932 and 1986 aimed at the conservation and improvement of the forest resources, they did not result in satisfactory outcome (Elmahi and Abdel Magid, 2002).

Both forest policies were formulated indoor by forestry professionals alone without consultation with all other relevant actors. This has led to the lack of commitment among other stakeholders and lack of political will that required for their enforcement. Also both policies lack the tools required for their implementation and necessary elements of monitoring and evaluation (Elmahi and Abdel Magid, 2002). At the same time Sudan is lacking a comprehensive policy and legislative framework that deals with land use in an integrated way (Atta Elmoula 1985, Tolentino 1994). Rather, there are a number of individual sectoral policies e.g. agriculture, wildlife and other resources. Hence Forest resources in Sudan are rapidly degrading; ground vegetation has disappeared from extensive areas, resulting in environmental degradation.



### **1.3. Objectives**

The general objective of this Study is to investigate the existing forest policy and laws to achieve sustainable forest management in Sudan.

#### **The Specific objectives are:**

- 1- To assess the suitability and relevance of policies, legislations and laws to sustainable forest management.
- 2- To assess the role of institutions related to forest resources in the promotion and implementation of forest policy, legislations and laws to achieve planned objectives.
- 3- To verify how the international conventions goals related to forest resource have been absorbed in the national polices and legislation of Sudan

### **1.4. Research Questions**

1. Is the existing forest policy and laws leading to sustainable forest management?
2. Is the role of forests institutions and other stakeholders identified in relation to the design, development and, implementation of policies, legislations and laws?
3. Are these policies influenced by international conventions and become more interdependent?

## **CHAPER TWO**

### **LITERATURE REVIEW**

#### **2.1. Principles of forest policy**

##### **2.1.1. Policy, forest policy and laws**

The Policy is a course or principles of action adopted proposed by a government, party, business or individual. Policy should express the fairest way of dealing with an issue, in general. Policy should have a broad application and reflect the interests of the group that develop it (Thraw, 1999). Indeed, policies are adopted and followed not only by government but also in several places in society, in industry, by land owners and in villagers.

The legislation is mean to orient and control the behavior of individuals and groups in accordance with declared policy. Laws and regulations define both incentives to encourage compliance with the objectives of policy and penalties to discourage actions that are counterproductive to its achievement. They also assign enforcement responsibilities to one or more executive agencies (Van Maaren, 1986).

The Forest Policy is a group of principles and national guidelines (technical, economic and social) aiming at the protection and development of the forest on sustainable basis, with a future outlook and integration with the other investment activities according to the general national policy and plans (Thraw, 1999; Abdel Nour, 2006). Forest Policy not only has point of contact with other land use policies, a country's economic, social and environmental policies influence and is influence by forest policy in a web of complicated and sometime very clearly visible interaction that changes as

societies and government shift their priorities. (Van Maaren, 1986). Forest Policy is concerned to many aspect in which forests and trees resources should be managed to serve the needs of people and also to meet societies for the other services that forestry can provide as well as the non-material values that forests represent (Kanoan, 2004).

### **2.1.2. The objectives of the policy and forest policy**

A policy is aiming to contribute to the achievement of the objectives or goals, without a clear estimation or definition of the objectives to arrive at in the future (Kanoan, 2004). According to Babiker (2008a) forest Policy should be target to specific objectives and accompanied by action plan or program. It requires three conditions, these the following:

- 1- Appropriate to a countries physical and socio-economic condition,
- 2- Acceptable to or at least tolerated by those who are affected by it,
- 3- Backed by the necessary technical, financial and human resources for implementations well as legislation.

The main objectives of the Forest Policy are the following:

Protecting, establishing and developing forestry resources, in the Sudan in a way that achieves full protection for the environment and meeting the country's needs in terms of food products. By assessment and national planning to invest the forestland, and reassuring the role in the agricultural production and combating desertification. (Adam, *et al*, 2007)

### **2.1.3. The forest policy framework**

Generally forest policy promulgated at the national level provides the basic framework within which however level policies are set out. This is not always the case, many far-reaching policies, legislations and institutional

changes have come about. These included: The revision of forest policy enactment of an autonomous Para -statal forests corporation with defined responsibilities and power; enactment of a revised forests act; incorporation of forestry into the country strategic planning process and passing of presidential decrees and a forest reservation and designated federal and state forests and aspects of national consecution which expedited the process of devolution of forest management and sharing of revenue with state governments (Babiker, 2008a).

The drafting or revision of legislation therefore, should be done within the framework of national forest policy, if no such policy exists; it is advisable to formulate one (Kanoan, 2004). Abdel Nour (2006) said: The most opportunities and issues that national forest policy must addresses are related to some element are the following:

- Achievement the conservation and the development for sustainable forest management through local, national and global demand,
- To addresses the two problems of environmental degradation and poverty alleviation in the fragile and low potential areas,
- Promoting tree growing through the farm and community forestry as an integrated to farming system.
- To ensure the proper integration of forest and forest industries as a full option in rural development,
- improvement of economic activity of forest through fuller utilization of forest and forest products by active market development,
- Encouraging the full involvements of rural people and private owners in forestry activities as actors and beneficiaries.

#### **2.1.4. Main guiding principles or instruments for policy implementation**

- 1- Limiting cutting of trees in reserved areas and restricting cutting in natural forests.
- 2- Before opening any forest area to investment, the investor shall have to transform the cut trees to useful forest products, in condition that 15% of the rain scheme and not less than 5% of the irrigated scheme shall have to be used as forests for production and production purposes.
- 3- Facilitating forest reserving procedures for the purpose of reserving not less than 20% of the Sudan area to realize the protective and productive objectives for forests, taking into consideration what the Sudan has experienced in terms of erosion, environmental deterioration and desertification, in order to cope with the international standards in this respect.
- 4- Encouraging private sector and landlords to consider timber wood as part of the products that can be bought and sold. And to re-plant them through agricultural cycles on the same footing as cash crops without putting any restrictions on forests authorities and providing financial material and technical support for the rehabilitation of private or individual forests and encouraging the community forests system in the rural areas in addition to agricultural a forestation.
- 5- Developing Gum Arabic forests, combating the dangers of desertification at the national level.
- 6- Giving more attention to the extension aspect and the provision of seedlings and technical advice to the citizens in order to develop community and individual forests together with reforestation and a forestation of villages, towns, facilities and roads (Adam, *et al*, 2007).

The proper implementation of forest policies is dependent on the following conditions:

- 1- The capacity of the forests institutional organization to implement the policy program (human resources/ capacity building / working environment),
- 2- Availability of the fund,
- 3- Commitment of all stake holders to implement policy objective and programs related to them,
- 4- Coordination between the administration and the different partner as to sharing the information and experiences,
- 5- Efficiency of means and tools that help in the implementation of the policy objectives (Merio and Paveri,1997, Elmahi and Abdel Hamid, 2004).

### **2.1.5. Tools for implementation**

According to Montalement and Schmithuen (2007) policy development must be following by legally binding norms. Laws and Regulation are thus the result of policy formulation processes as well as being the basis for their implementation. Changes in national polices, putting more emphasis to the sustainability of forest resources for the development must led to a systematic review and, in many instances, to a considerable modification of legislation, whether it specifically addresses forest and forestry (nominal forest law) or has an indirect impact on forestry . On the other hand, tacking the issue of implementation tools required to consider the following points:

1. The traditional roles of legislations and procedures in the implementations polices,

2. The discussion of the causes of success and failures of legislations in the conservation of the forests,
3. The utilization of tools and means consisting of punishments and incentive the carrot and the stick (Merio and Paveri, 1997). On the other hand, These tools are divided in to the following:

**Mandatory tools:** The breaking of which would constitute a crime punched by laws. These tools comprised the following:

- The national laws and legislations. These are issue by the high legislative authority and are apply in all parts of the country,
- The legally binding regional and international agreements.
- Other national legislations having an impact on the forests like those related to land tenure, exploitation and other legislations,
- Binding governmental orders or decrees issued by the head of state or by the concerned minister,
- The local legislations (Kanoan, 2004). There is usually being sub-national.

**Voluntary tools:** There are focuses on the incentive carrot. They offer specific incentives to the individual or to the community to encourage them to be involved in the development and maintenance of forests. Babiker (2008a) mentioned that tools are consisting of economic and financial procedures and one summarized as follows:

- 1- Economical procedures including indemnities, incentives and grants, tax exemption or tax reductions, incentives on technical initiatives, mutual advantages (a forestation for constructions in rural areas).
- 2- Procedures resulting from the influence of the market, including for example the impact of preferential prices of agricultural products on the

activities in the forest sector, the amount of custom taxes on the export of forest products or the amount of taxes imposed on the products sold in the local market, the creation of new markets and the encouragement on the marketing of environmentally friendly products and services, the selling of pollution rights and quotas, the special pricing of wood harvesting from forests managed in a sustainable and technically correct manner (certification).

**Complementary Tools:** The Complementary Tools are specialized in convincing using the different communication means to the spread of the information needed for the implementation of mandatory and voluntary procedures. This is done through the explanation of these procedures and through the definitions of the responsibilities of the individuals and communities in the elaboration and implementation of the policy, supported by the expected benefits. These tools will also focus on the values and heritage calling for the conservation of the natural resources (Elmahi and Abdelmagid, 2002) and (Kanoan, 2004).

#### **2.1.6. The policy law-continuum**

The process of formulation and implementation of policy and law should be considering as a single continuum rather than two isolated stages. During forestry policy formulation, legislation should be kept in mind for a number of reasons. First; a policy must not conflict with the constitution or other fundamental laws of a country. Second, consideration of whether and how forestry legislation could be subsequently issued to implement the policy can help in the formulation of the policy in a pragmatic way. A third reason relates to relevant institutions: consideration of their effectiveness in the past



can help in the realistic formulation of new policies and laws. Legislation should be designing to facilitate the effective functioning of institutions that exist or may be creating (Elmahi and Abdel Magid, 2002). The revision of legislation may be an opportunity for an effective reorganization of institutions. Finally, legislation facilitates future policy formulation or revision, for example by creating policy advisory bodies that will also eventually propose revisions to legislation. The law may prescribe that the various government and private interests involved be represent in the advisory body and specify cases and issues in which the body must be heard as well as the degree to which its advice must be considered (Montalement and Schmithuen, 2007).

#### **2.1.7. Forestry legislations**

Forest legislation is one of the important institutional elements for the development expansion of the forest sector. It provides the structural framework within which national forest policies are set and in turn reflect or should reflects their objectives and priorities (Schmithuen, 1986). The need for a revision of existing forestry legislation may arise for a number of reasons. One common reason for the lack of support from local population for existing forestry laws and therefore problems of implementation is the inadequate recognition in these laws of traditional ownership and usage rights (Kanoan, 2004). The accommodation of usage rights in forestry legislation requires a number of adjustments, not only recognition of the rights, but also provisions such as the participation of the rights holders in forestry management and the multiple uses of forestry reserves. A change of governmental system (for example federal system and conversion towards market economies) may also lead to a revision or replacement of forestry

legislation. In these cases, there is often a tendency to replace all of the existing legislation, especially that dealing with issues of landownership and usage including forestry (Babiker, 2008a)

### **2.1.9. The forests lands tenure**

One of the important institutional prerequisites for sustainable forest management is legislation that establishes appropriate and reliable forms of forest tenure, including various forms of forest ownership and use rights. Forest laws and regulations must include provisions that determine:

1. The categories and nature of forest ownership;
2. The rights and obligations of different categories of forest owners;
3. The categories and nature of usage rights

In many countries, government forest tenure is the dominant or exclusive category of forest ownership. If the forest law is geared exclusively to public ownership; it may present considerable obstacles to private initiatives in tree planting (Babiker, 2008b).

## **2.2. The Historical Account of Forest Policy in the Sudan**

### **2.2.1. Forest Policy and legislation Under the Colonial regime**

The department of forest in the Sudan established in 1901, by British Government. Initially, its main purpose was to secure a good supply of wood for the steamers plying the River Nile. Firstly law makes in 1901; the woods and forests department established with Rail ways and Steamer service in 1902; and the Forest conservation Rules in 1917 (Abdel Magid and Mohammed, 2013). For the Colonial Government these ordinances were intended for exploitation of the country's forests recourses to satisfy the national needs for woods to operate the Steam-powered trains, river

paddleboats, railway sleeper, bridge timber and fuel wood for the main cities (Elmahi and Abdel Magid, 2002).

#### **2.2.1.1. The forest policy 1932**

The Governor General of the Sudan ratified the first National Forests Policy statement in 1932, It emphasis on both the protective and the productive roles of the forests. A distinct separation was made between the roles of the Provincial Forests Administration in supplying the needs of rural areas and protecting rural lands; and that of the Central Forest Administration in managing the central forest reserves and supplying the urban areas with their wood supplies and the supply of railway sleepers (Elwakeel and Ali, 2003).

The same year witnessed the enactment of two important laws namely: the Central Forests Ordinance and the Provincial Forest Ordinance that were designed to enforce the newly set policy and particularly forest management inside central and provincial forest reserves (Elmahi and Abdel Magid, 2002).The statement of forest policy divided the forest resources management between forests administration and government of the provinces. On the other hand the administration of forest aimed to develop the natural resources and their products to ensure sustained forest goods and services to make the Sudan self-sufficient consequently reducing imports to the minimum. On the other hand, the provincial authorities with the assistance of local government were entrusted to control gum areas and to protect forest against damage by the fires or the grazing (Babiker, 2008a).

The forest policy adopted a conservation strategy designed to concentrate felling in forest reserves as regeneration could be assured. Its main objective to protect and reserve about 15 percent of the total area of Sudan as reserved

forest. A licensing system and a definite felling program would control felling in the reserves, but royalty could only be collected on forest product originating from areas outside the forest reserves (kanoan, 2004).

#### **2.2.1.2. The provincial forest ordinance (Amendment) 1948 and 1959**

In 1948, the Provincial Forest Ordinance of 1932 was amended, to enable governors of provinces to delegate all or any of their powers to local government authorities (Babiker, 2008a).

A significant amendment to the Provincial Forest Ordinance (Amendment) 1959 was made in an attempt by the forestry authorities to take control over timbre based sawmilling industry. The Provincial Forest Ordinance (Amendment) 1959 required a license to be issued from the Minister of Agriculture before erecting private sawmills using mechanical means (Abdall, 2004).

#### **2.2.2. Forest Policy and legislations in the aftermath of independence**

##### **2.2.2.1. The Amendment Consequential to the Provincial Administration Act, 1961**

In 1960, the provincial Administration Act came into force. Subsequently, the amendment (Consequential to the Provincial Administration Act, 1960) were promulgated. They developed the powers of the director of forest conferred under the Central Forest Ordinance 1932 and the provincial Forest Ordinance to manage forests to people's Executive Council of each province. The authorities allocated limited resources to forest development. Consequently, there had been much over cutting without replanting (Kanoan, 2004).

#### **2.2.2.2. People's Local Government Act 1971, 1981 and Regional 1980**

Promulgation of numerous and often conflicting laws since 1971 has had the effect of transferring forest manage authority from the central government to regional and local government. Because of the Regionalization Act of 1981, the forestry sector was decentralized and the Regional Directors of forestry became responsible to Regional Governors throw the Regional Director Generals of Agriculture. The administration of forestry research was transferred to the Agricultural Research Corporation (ARC) in the Ministry of Agriculture. Forestry Education and Training administrated by the college of forestry was but under the Ministry of Education (Abdalla, 2004).

Although regionalization led to devolution of responsibility, it did not led to increase funds to the regions, and thus, resulting in the mining of forest resources to generate funds locally, The funds generated in this way were directed to Ministry of Finance and were not reallocated to the Forest Administration either nationally or regionally (FAO, 2003).

A major decentralization process was further developed by the promulgation of the Regional Government Act 1980 and the People's Local Government Act 1981; The Regional Government Act1980 divided the power between the Central Government and Regional Government.

The people's Local Government Act, 1981stipulated the established of district council in every province (Abdalla, 2004).

#### **2.2.2.3. The Forest Policy 1986**

The 1932 Forest Policy was amended in 1986 to reinstate central government control of forest resource management and address the environmental crisis (Kobbail, 2005). The 1986 Forest Policy Statement also

responded to the new concepts that emerged since the seventies that put emphasis on the multiple uses of forests, environment protection and the concept of popular participation (Elmahi and Abdel Magid, 2002). The Statement recognized new approaches of forest and tree tenure including: institutional, community, investment and private forests (Babiker, 2008a).

In this regard, the policy emphasized the role of community forestry and popular participation and environmental protection in forest management and rehabilitation the element of 1986 forest policy are as follows:

- Recognized and encouraged the establishment of community, private and institutional forests. The latter includes irrigated forest plantations within agricultural schemes.
- Stressed the role of people participation in forest plantation, management and protection.
- Stressed the role of forest extension.
- Conceptualized the multiple uses of forests.
- Awareness raising, environmental education and guidance in all educational and social institutions.
- Encouraging the local population, to participate in projects preparation and implementation.
- Realization of agriculture and forest integration through the introduction of the tree in the agricultural cycle by 5% in the irrigated agricultural schemes and by 10% in the rain-fed sector.
- Subjected tree cutting outside the forest reserves to the discretion of the director, Central Forest Administration provided these areas be reserved immediately following their utilization for the purpose of their protection and regeneration.

- Stressed the mobilization of popular and agreement international efforts for participation in a forestation, protection and planting of forest
- Raising the national goal of forest reserves from 15 to 20 percentage of the total area of the country for environmental protection and meeting the population's needs of forest product
- Divided forest administration responsibility between the Central Government and the Regions (states and provinces)
- Made the director, Central Forest Administration (CFA) the official counselor to the regional authorities and institutions on forest matter (Kobbail and Elfeel, 2012).

At this a policy making level, the forestry sector started to receive increasing attention, and the environmental role of forests and trees, including the containment of desertification and land degradation, has been appreciated (Elmahi and Abdel Magid, 2002).

#### **2.2.2.4. The Forest Act 1989**

Since 1989, Government Organizations (GO) Faced declared and undeclared political/ diplomatic isolation and economic embargo. The whole nation got entrenched for authority measure and self-reliance polices. It suffices perhaps to point out that the overall foreign support to Sudan ranged between 800million and one billion US \$per annum during the seventies and eighties (Babiker, 2008a).

In spite of everything however, the Forest Sector Review 1986 (FSR) and the resulting Forest Resources Conservation Project 1989 (FRCP) were established by FNC. The latter coupled with amended of Forest Policy (FP)

statement (1986), led to revision of Forest Act (1989), the political and public recognition (Kanoan, 2004).

#### **2.2.2.5. The Proposed forest policy of 2005**

Abdel Magid (2006) mentioned that in a new forest policy proposed in 2005. This policy was formulated through extensive community consultation process by the project (TCP/SUD/2903 Revision of Forest Policy 1986, Legislation and Institutional Reorganization in collaboration with FNC, Sudan), which has not yet been ratified, is expected to make major changes in forest development and management.

The drivers for the amended of the forest policy included the improvement of people's livelihood, poverty alleviation, amelioration of physical environment and combating desertification.

The reservation of forest area as a community forest presupposes coordination between the local leader, the locality, the commissioner and the state minister of agriculture to establish rights of the community over the particular area.).

#### **2.2.3. The Comprehensive National Strategies (CNS 1992 – 2002 and 2003 - 2027)**

The Comprehensive National Strategies (CNS 1992 – 2002 and 2003 - 2027) are both concerned with the importance of forestry in environmental conservation and as a source of goods and services for the country and local communities. The CNS supported an increase in forest cover, range and nature reserves to an area equivalent to 25% of Sudan area. Since 1992, Sudan also put in place several strategies, policies and programmes,



It's concerned with the importance of forestry in environmental conservation and as a source of goods and services for the country and local communities (Elhassan, 2000). The CNS supported an increase in forest cover, range and nature reserves to an area equivalent to 25% of Sudan area. Since 1992, Sudan also put in place several strategies, policies and programmes aimed at sustainable development, these include:

- National Environmental Action Plan Capacity 21 Sudan,
- National Biodiversity Strategy (2001),
- National Action Plan to combat Desertification (2002),
- Climate Change plans and Project " (Wilkie, *et al*, 2003).

#### **2. 2.4. Forest and Renewable Natural Resources Act (2002)**

This act allows for the creation of "Reserved Areas" by a virtue of a decree at the request of owners or if deemed in the public interest without compensation to the owners. The reserved areas should be used in a sustainable manner (Babiker, 2008a). The act stated the Forest National Corporation as the competent authority and enacted it with the following responsibilities,

- a. Lay down general policies for forests and their development and the implementation of such policies
- b. Technically supervise all forests in the country and increase the reserved forest up to 20% of total area of the country
- c. Propose laws and disseminate awareness and encourage the tree planting at all levels.
- d. Develop the production of gum Arabic and care for other forestry products.

The act also included that at least 5% of all irrigated schemes (such as Kenana) should be preserved for forests. This is 10% for the rain fed agricultural schemes (Eldool, 1995).

### **2.2.5. Constitutions of the Republic of Sudan**

Realizing the importance of environment protection the National Assembly passed the 2005, Interim National Constitution of the Republic of Sudan in which there is a clear commitment towards the environment protection. With respect to the protection of the environment chapter 2 articles 11 of the Interim National Constitutions of the Republic of the Sudan States:

- i. The people of the Sudan shall have the right to clean and diverse environment; the State and the citizens have the duty to preserve and promote the country's Biodiversity.
- ii. The State shall not pursue any policy, or take or permit any action which may adversely affect the existence of any species of animal or vegetative life, their natural or adopted habitat.
- iii. The state shall promote, through legislation, sustainable utilization of natural resources and best practices with respect to their management (Byron and Arnold, 1999).

It is worth noting that the previous 1998 constitution was also committed to the protection of the environment. Article 13 refers to the role of the State in the protection of the environment in its purity and natural balance in pursuance of safety and sustainable development for the benefit of generations. The constitution also in Article 9 refers to natural resources as national heritage and public property regulated by law and "the state shall provide plans and appropriate conditions for the development of the

financial and human resources necessary for utilizing such wealth" (Wilkie, *et al*, 2003).

## **2.3. International conventions**

### **2.3.1. Background**

Since the issuance of the forestry sector review (1986), a number of changes and events have taken place in relation to the Forestry Sector and in its operating and societal environment at the national and international level. The World Summit in Rio 1992 had taken a decision to place forests in a coherent and comprehensive context of sustainable development, and as a natural resource base for economic and social advancement (Earth Summit, 1992). The Summit acknowledges the multiple and varying functions of forests for economic and environmental values and for poverty alleviation and as natural habitats and environment. The Intergovernmental Panel on Forests (IPF), and subsequently the Intergovernmental Forum on Forests (IFF), called for inter-sector approaches and coordinating mechanisms with all programmes and projects affecting forests (Babiker, 2008a).

### **2.3.2. Convention on desertification**

The United Nations general Assembly decided to organize a conference on desertification (UNCOD) which was convened in Nairobi, 1977 (Salih, 2007) however, the convention to combat desertification (UNCCD) became legally binding in 1996. The objectives of the (UNCCD) is to combat desertification and mitigate the effects of drought through the adoption of action program at all levels supported by international cooperation and partnership arrangements with the aim of achieving sustainable development in affected

areas (Aawad, 2005).Sudan signed the UNCCD when it was open for signature in Paris in October 1994 and ratified in1995 (kanoan, 2004).

### **2.3.3. Convention on biological diversity, Convention on Climate Change and The Forest Principles and Agenda21 (Rio de janeiro1992)**

Babiker, 2008a said the objectives of this convention are the conservation of biological diversity and the sustainable use of its components and the fair equitable sharing of the benefits arising out of the utilization of genetic resources Sudan signed the convention on biological diversity (CBD) in June 1992. Sudan becomes a party to the CBD since October 1995 after ratification of the convention (CBD, 1992).

The objective of the Framework Convention on Climatic Change (FCCC) is the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The convention recognizes the ecological role of forests as carbon sinks. In implementing greenhouse gas reductions countries are encouraged to improve the conditions, either by increasing the amount of land under forest cover or at least by conserving existing forest areas Sudan is a party to the FCCC since1993 (Salih, 2007).

The Statement of forest Principles calls for the strengthening of public participation. It recognized the indigenous and local Knowledge in forest management and the participation of woman in the management and conservation of forests (Abdel Magid and Mohammed, 2013).

The statement of forest principles stresses the need for strengthening the national institutions as regards education, research and training in furtherance of sustainable forest management. The strengthening of international institutions to provide for new or additional financial resources

to developing countries to manage conserve and develop their forests is also stressed (United Nations, 1992). Sudan was signatory to both the statement of Forests principles and agenda 21 (Oyebo, 2008).

#### **2.3.4. African Convention on the Conservation of Nature and Natural Resource**

The African convention entered into force in 1969 is a regional convention dealing with natural resources conservation. It is considered as the most important and single legal framework for the conservation of Africa biodiversity. It aimed at the conservation utilization development of soil, water, flora and fauna resources in accordance with scientific principles and with due regard to the best interests of the people. Sudan is apart to the African convention on the Conservation of Natural Resources since its ratification in 1973 (kanoan, 2004).

#### **2.3.5. Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramser, 1971)**

The Ramsar Convention imposes on contracting parties the obligation to formulate and implement their planning to promote the conservation and wise use of wetlands within their boundaries The biological relation between wetlands and forestry ecosystems is well known .Sudan is committed to this convention in 2005 (Abdel Hameed, 2006) and (Abdelmagid and Mohammed, 2013).

#### **2.3.6. Natural Heritage (Paris1972)**

The emphasis of this Convention to the protection of natural and cultural heritage of outstanding universal value from the historical, aesthetic, ethnological, anthropological, scientific, geological or natural point of view.

Sudan ratified this convention on 1972. The Bjarwaya Cultural Heritage site was declared since 2003(kanoan, 2004).

### **2.3.7. Convention on International Trade in Endangered Species of Wild fauna and flora (CITES) Washington D.C.1973**

CITES Signed on March 1973 and entered into force on July1975 is a significant agreement dealing with forest in the context of natural resources and protecting the endangered species of wild fauna and flora (kanoan2004). The aim of this convention is to protect certain endangered species from over exploitation by means of a system of import export permits. Sudan has become a party to CITES on the 24<sup>th</sup> of Jan 1983 (Abdalla, 2004).

### **2.3.8. Convention on the Conservation Migratory Species of wild Animals (Bonn, 23 June 1979)**

The convention of Migratory species of Wild Animals also known as the Bonn Convention, aim to conserve terrestrial marine and avian migratory species throughout their range. It is concerned with the conservation of wildlife habitats on a global scale. The convention entered into force in November 1983 (Abdalla, 2004). Sudan is not party to the Bonn Convention (kanoan, 2004).

### **2.3.9. Regional Convention for Conservation of the Red sea and Gulf of Aden (Jeddah1982)**

The red sea is a unique and complex marine environment, it is a rich in biological diversity. The objectives of this convention are the rational exploitation of marine species coral reefs and coastal natural resources in order to achieve sustainable development. Sudan is a part to the Jeddah convention since 1984 (kanoan, 2004).

### **2.3.10. International Tropical Timber Agreement 1983\1994 (ITTA, Geneva)**

The International Tropical timber Agreement in 1983 is a commodity agreement dealing with the conservation and development of tropical timber (kanoan, 2004). Sudan is not a party to the ITTA May be the reason lies in the fact that it has ravaged economic prosperity and precipitated to days environmental crises (Ibid).

### **2.3.11. KYOTO Protocol to Framework Convention on Climate Change (1997)**

The Kyoto protocol encourages developed countries as their contribution to reducing their emissions with regard to CCD commitments are being implemented especially in Sahelian countries (FAO, 2004). The protocol represents a historic first step in an ongoing process to deal with climatic change. Sudan becomes part to Kyoto Protocol in 2005 (kanoan, 2004).

### **2.3.12. Cartagena Protocol on Biodiversity to the Convention on biological diversity**

The Cartagena Protocol convened in Canada in 2000 Sudan becomes party to the Protocol on 13June and ratified it in Sep 2005 (Abdel Magid, 2006).

### **2.3.2. Compliance of Sudanese forest policy with the international conventions**

Babiker (2008a) reported that the resolution of the World Summit on sustainable development puts forests in a coherent and comprehensive perspective of sustainable development and as a natural resource base for economic and social development It recognizes the multiple and varying functions of forests for poverty alleviation So forestry for local community

development is perceived as an important aspect of sustainable forest management. Therefore, forest policy must be directed to enhance the livelihood and well-being of rural people and to preserve their cultural heritage through their involvement in the management and implementation of forest projects.

The FNC has implemented with coordination Forestry Development Project a National Consumption Survey of forest product (1995), a National energy assessment to expand forest reservation and forestation.

The Comprehensive National Strategy of 1992- 2002 called for allocation of 25% of the total areas of the country for forestry, range and wild-life and also called for the preparation of the process of environmental impact assessment for actions that are likely to have a significant impact on the environment.

Worth mentioned is the fact that Sudan has embarked on National Forest Program (NFP) even before 1992. In 1986 the World Bank and bilateral donors launched the Forestry Sector Review, which has been adopting as the county's NFP. The need for institutional change and the revision of laws and regulation were among the recommendations adopted by the review. As a result, 1986 Forest Policy was adopted and the Forest Act 1989 was promulgated (Elmahi and Abdel Magid, 2002).

These instruments recognized the principle of public participation, multiple uses of forest, new form of forest tenure such as private, community and institutional forest, and recognized the need for research in forest development and the role of forest extension. Furthermore the forest policy an appreciated the need for coordination at sub regional, regional and



international levels, as well, it a knowledge the significant role of Non-Governmental Organizations to combat desertification.

Considering the issue of the protection of threatened species and population, the forest policy addressed the topic by clearly prohibiting the cutting of threatens species such as Higlig trees (Babiker, 2008a).

As concerns aspects of conservation of natural habitats, watershed and protection fragile ecosystems, the forest policy has considered them within the theme of the environmental conservation.

In spite of all the efforts forwarded by the Sudanese forestry in modifying the forest policy to be in line with agreed upon international conventions, it is clear that the following issues need further considerations:

- Management of natural Forest Participation of population and local communities in decisions on the design and implementation of programs to combat desertification
- In spite of big numbers of organizations and NGOs working in desertification control in the country. Coordination is needed with them to achieve good results based on clear and long-term strategies
- Promotion of forestry for rural development
- Needs for policy framework for sustainable management. In this respect, forest policy must set under basic framework including all the legislations and their revisions
- Promotion of the exchange of information on appropriate technology, knowledge, know-how and practice.
- Recognition of role of the indigenous and local knowledge in forest management and the participation of women in the management and conservation of forest

- Formulation of Criteria and guidelines to help sustainable management, conservation and utilization of forest
- Adoption of land use plans that are based on scientific investigation, improved farming methods which ensure long-term productivity
- Consider climatic change in their relevant social, economic and environmental policies (Elmahi and Abdel Magid, 2002).

#### **2.4. Sustainable Forest Management**

Sustainable forestry means managing our forests to meet the needs of the present without compromising the ability of future generations to meet their own needs by practicing a land stewardship ethic which integrates the growing, nurturing, and harvesting of trees for useful products with the conservation of soil, air, and water quality, wildlife and fish habitat, and aesthetics (American Forest and Paper Association 1995).

Thus, sustainable development as a concept and a goal has become widely accepted for the management of forest and other natural resources (Thompson, 1999). This acceptance has created support for shift in forest policy from one, which focused on the sustainable harvesting of “dominant product, primarily wood” to one which is concerned with managing the forest as a “complex” valuable natural resource system (Kobbail, 2005).

Sustainable development is not a fixed state of harmony, but rather a process of change in which exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs (Patosaar, 2007).

To operate sustainably, forest managers may need to devote as much time to convening and facilitating agreement on the desired future conditions of the forests under their stewardship or authority as on planning and implementing the technical methods to produce the desired goods and services in an environmentally sound manner (Society of American Foresters, 1999). Sustainability depends on citizens and stakeholders adopting stewardship and individual responsibility as tenets by which to live and moving from conflict to collaboration (Wilkie *et al*, 2003).

FAO, (1998) argued that to attain sustainability, forest management should be practiced on an operational and not an experimental scale. It should a balance and comprehensive range of management activities; that include working plans, yield prediction and control and other technical requirements in addition to a wider political, social and economic criterion.

The concept of society forestry management (SFM) has continued to evolve since 1992 through the international forest policy dialogue within Intergovernmental Panel on Forests (IPF), Intergovernmental Forum on Forests (IFF) and United Nations Forum on Forest (UNFF) and through a large number of country-led and eco-regional initiatives aimed at translating the concept into practice - including the development of criteria and indicators of sustainable forest management supported by international organizations such as the Food and Agriculture Organization of the United Nations (FAO), the International Tropical Timber Organization (ITTO), United Nations Environment Programme (UNEP) and other members of the Collaborative Partnership on Forests. These efforts have stimulated changes in forest policy and legislation and in forest management practices throughout the world. Public participation in forest management has

increased in many countries and broader approaches to forest management, such as ecosystem and landscape management are becoming more widely accepted and applied. Integrated strategies for forest conservation, in which conservation of forest resources and biological diversity entails management both inside and outside protected areas, are increasingly being developed (FAO, 2001).

## **CHAPTER THREE**

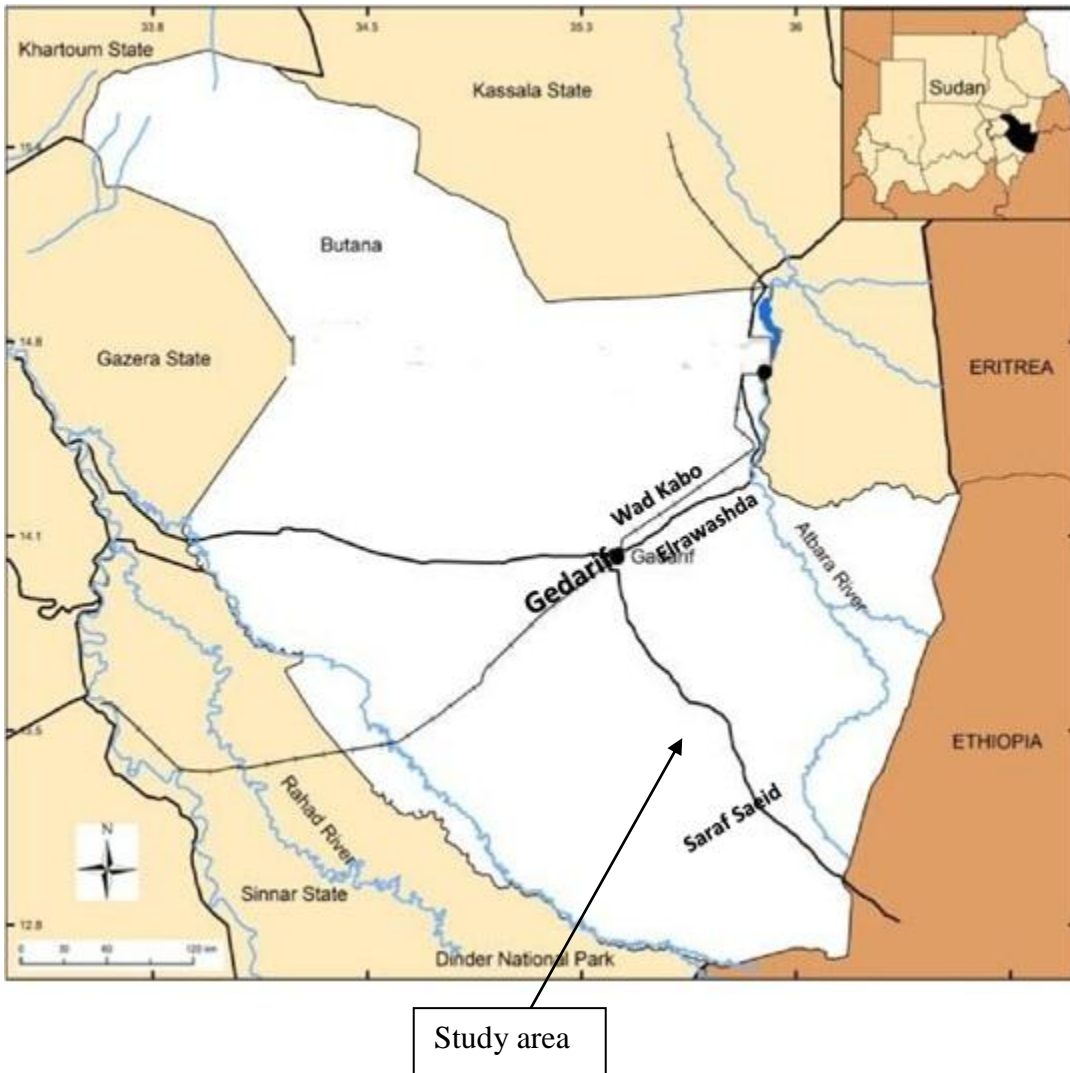
### **STUDY AREA**

#### **3.1. Location**

The Gedarif State is one of East-central States of the Sudan, bordering Kassala State on the East, River Nile and Khartoum State to the North, the Gazira and Sinnar State to the West, and the Ethiopian border to the South (Figure 3.1). It lies between longitudes 36°-33°E and latitude 14°-16°N. The State is connected to the national capital (Khartoum, 411 kms) and the main sea-port (Port Sudan, 834 kms) by the national capital high way road. Gedarif State has an area of approximately 71,000sq.km ( Abdalla, 2006). The State is divided into ten localities for administrative purposes as follows: Butana, Fashaga, Central Gedarif, Gedarif Town, Faw, Rahad, Quala Elnahal, Western Gallabat, Eastern Gallabat and Gurrisha (Elmadina, 2006).

The State is transected by the River Atbara and its tributaries Setite and Basalam on the East; and river Rahad on the west; both are tributaries of the River Nile. The River Atbara is supplying water to New Halfa irrigated scheme on the north east border of the State, while Rahad River supply water to the Rahad irrigated scheme on the north west part of the State (Ministry of Agriculture- Gedarif State, 2002).

## Location the Study Area



Source. <https://www.google.com/search?q=Gedarif+State+map+in+Sudan&ie=utf-8&oe=utf-8&client=firefox-b>.

### **3.2. Population**

The 2008, national census showed that the state populations increased to 1.348 thousand people. The state population includes most of the tribes living in Sudan. These include both Arabs and non –Arabic origin (Gismalla, 2008).

The people of the state divide themselves into many tribes, this include the original people of the Broons living at the footsteps of the Ethiopian mountains, at Taya district, western Gallabat locality, to the pure nomadic tribes of Shukriya, living in the Buttana locality, in the northern part of the state. The state also includes other nomadic and sedentary or semi-nomadic tribes like lahawien, Dabania, Bawadra and Gaaliyen. Also many tribes from western Sudan found in the state like: Four; Falata; Masaliet and Bargo, are living in the villages south of Gederif town. West Africans tribes also found in the state, espassially living along the rivers banks, like Atbara and Rahad rivers, they also live in villages and have both irrigated and rain fed farms. These include the Fulani; Housa; and Barno, as they Known by Sudanese.

Urban population, constitute a mixer of all tribes living in the Sudan. They live in Gadarif and Showak towns, together with the new town of Faw. There are also fourteen refugees camps, dotted all over the state; with both Eritrean and Ethiopian refugees, the total refugees estimated to about 49,491 (Abdalla, 2018).

The Gedarif State which lies in the central clay plain is one of the most productive areas in the Sudan (Elmubarak, 2002). The state that largely devoted to rain-fed farming constitutes over 50% of the mechanized rain-fed schemes in the country. This provides a large quantity of crops residues and

other agricultural by product; in addition the northern part of the state is very rich in natural pastures that extend to other neighboring states. All these lead to increased livestock number that account to over six millions animal head (Abu Sin and El Sammani, 1986).

### **3.3. Climate**

The Gedarif State, as it stretches from north to south, have an annual rainfall that started from 200mm in the north to 800mm in the south. The state has rainy season extending for about four months from May to October (Abdalla, 2018). The prevailing wind during the wet season is from southwest and from north direction in the dry season. The temperature ranges from mean minimum 17c° in Jan to mean maximum of 47 c° in April and May. The relative humidity ranges from 20-30% in the dry season to 45-60% in the rainy season (Mechanized Agricultural Corporation Gedarif, 2003).

### **3.4. Topography and soil**

Gedarif State is well known for its vast flat areas that are suitable for both farming and grazing. The Butana area, to the north of the state, is a vast flat grazing land with good pastures during the rainy season. There are some mountains ridges in the Butana, increasing when moving south ward (Osman, 2000). The mountains increase in numbers and size towards the Ethiopian borders.

The Gedarif area is characterized by a semi-arid climate which is related to soils having dark colors, a high clay content and strong vitriolic properties. The area includes a large, rather uniform, clay plain intersected by small



valleys (Elmubarak, 2002). The clay content is very high and generally 75% to 80%. The color of the soils is very dark grayish brown. The organic matter and nitrogen content of the soil are low but as there is no deficiency of other plant nutrients, the soils are moderately fertile. The soils also have undesirable physical characteristics, such water logged for certain periods during the rainy season. Also, the soils are difficult to cultivate as they are very hard when dry and very sticky and plastic when wet, causing the moisture range at which the soils can be cultivated to be very narrow. Thus, mechanization of the land preparation operation is critical to work in this narrow time frame. In fact, without mechanization, it would be impossible to develop these vast areas of verticals (Glover, 2005).

### **3.5. Land uses**

According to Vink (1987) and Kobbail (2005), agriculture was and still is the main economic activity, followed by livestock raising in the traditional seasonal transhumant pattern, village livestock raising and, as a recent element; livestock raising by large scale mechanized farming has put increasing pressure on the forest. Gum tapping, collecting and trading of forest products and charcoal burning are other traditional forms of economic activities. Now as before many people derive their income from various combinations of the three main forms of land use: agriculture, grazing, and forest exploitation.

The traditional pattern of land use has been profoundly changed by population growth, the influx of refugees, a succession of drought years and more than else, and the unbridled expansion of large-scale mechanized

farming since the 1940's (Atta Elmoula (1985); Vink (1987); Glover (2005)).

Continued mono cropping on traditional and 'modern' farms alike has caused a decline in crop yields and an increase in infestation of crop land by the parasitic plant *Striga hermonthica*. Mechanized farming has taken over nomads 'traditional grazing grounds and blocked traditional migration routes. The destruction of the former forest-cover in general without any proper plan towards the utilization of the wood has exerted increasing pressure on the few remaining forests (Mustafa, 2006).

### **3.7. Forest Production**

The state is classified within the woodland savanna ecological division, which includes mixed types of vegetation composed of grass along with bushes and trees, which is the characteristic of the dry tropics with a monsoon rainfall confined to a few months, followed by a long hot dry season. The dominant tree in the region is the *Acacia Senegal*; its local name is Hashab (Elmadina, 2006).

The tree is a hardy leguminous tree belonging to the genus *Acacia*. It is an arid-zone tree well-known as a multi-purpose species providing gum Arabic, wood fuel, fodder and poles and improving the soil, also, its contribution towards environmental protection and economic development in the Sudano - Sahelian region is significant. In this zone the Hashab tree is of vital importance to the permanent farming system. The major economic activity of the forest is the production of gum Arabic from the Hashab tree. Gum Arabic is the natural gummy exudates obtained by tapping the branches of the Hashab tree (Kobbail, 2005). The final use of the product is in the off

shore pharmaceutical and cosmetic industries; so it is one of the key Sudanese export goods. The total area of forests in the Gedarif region is estimated at 1,600,000 feddans (672,268 hectares). The forests are registered and monitored by the forest management section of the Ministry of Agriculture. The Gedarif state average share was about 14% of the total production of gum Arabic throughout the period 1970-1998 in the country (Ibrahim, 2002).

## **CHAPTER FOUR**

### **RESEARCH METHODOLOGY**

This methodology is based on identifying components of policy making process as related to sustainable forest management and then the related parameters and variables along each component.

#### **4.1 Methods of data collection**

To collect data needed for the study, a reconnaissance visit was made to Gedarif State in April 2017. The visit was very valuable because it was possible to collect some basic data from the institutional sources, scientists and villagers to help in constructing the skeleton of the study, establishing the sampling techniques and deciding upon the appropriate sample size.

Data collection was based on secondary and primary data.

##### **4.1.1 Secondary data collection**

Sources of the secondary data used in this study included documents; articles; published reports; and unpublished papers and books. The institutions from which the data were collected included Forests National Corporation (FNC) at both central and state levels; Higher Council of Environment and Natural Resources (HCENR) at both central and state levels; Natural Resources Departments in central; Range and Pasture Department and Soil Conservation, at both central and state; Representatives of legislatures Parliaments and Unions both central and state levels; the Ministries of Environment, Agriculture and Forestry; Government Organizations (GOs) and Non-Government Organizations(NGOs) at both center and state such as Arab Organization for Agriculture Development; the

Sudanese Environment Conservation Society (SECS); The Sudanese Social Forestry Society and Food and Agriculture Organizations; Universities and Collages of Forestry and Range.

#### **4.1.2 Primary data collection**

To collect the primary data for the study the author adopted several methods such as questionnaire, interviews, group discussions and observations. Primary data were collected through structured interviews (questionnaire) and semi structured interviews using checklist.

##### **4.1.2.1 Socio economic aspect**

Socio economic aspect covered communities selected at Gedarif State around Saref Saaid, Wad Cabo and Elrawashda forests as representing for local communities.

The questionnaires (appendix 1) used information from villagers and leaders that being by individual and group. It was designed to obtain information about the socio -economic characteristics of respondents, awareness of the respondents about the importance of the forests in their life, the training and extension services provided for the local people, reasons of forest deterioration, participation of local people to conserve forest, awareness and Knowledge of local people for forest laws and on the promotion and implementation of forest laws at villages level. Two types of questions were used in the questionnaire: closed-end questions, with mostly multiple choices or yes and no style of answers, and dichotomous questions in step-wise style, each answer leading to a specific set of follow up questions with no open-ended questions except where it is inevitable.

These types of questions were used in the questionnaire in order to make the least demand upon respondents; to permit quick and efficient collection of data; and to enable easy, quick and accurate analysis of answers. The combination of questions and associated response categories sometimes help respondents to understand the questions more clearly and it is more useful in obtaining answers to sensitive questions. Open-ended questions were avoided, except where it was inevitable, because of their negative drawbacks which are represented in the difficulty of constructing questions at the proper level of generality and because the responses are difficult to analyze and summarize. They may also impose considerable burden on respondents and interviewees and they are more likely to produce irrelevant and worthless data.

**4.1.2.2 Semi Structured interviews:** using flexible checklist and open discussion with the key information were also used. The aim was to collect information about policies, legislation, and effective laws implementation, international conventions related to forest, policies and laws coordination of institutions were related to sustained management (see appendix (2-3-4-5-6)). This is to explore the views of the officers on the different issues discussed with the local community members with a reasonable depth since the officers and researchers have the insights to verify the different aspects in the study area and link them to scientific facts (Kobbail, 2005).

#### **4.1.2.3 Focus Group Discussion**

The Focus Group Discussion Included consist of twenty five individuals, it included officers; leaders; local peoples; children; youth and women.

## **4.2 Sampling and Sample Size**

The study covered three communities in Gedarif State living in villages close to three forests. These communities were living in Rawashda, Wadkab and Saraf Saeed villages. These villages were selected by stratified random sampling technique, where the villages were classified into large, medium and small on the basis of the population size in each village a 10 percent minimum sample size was ensured. A total of 150 respondents were interviewed. Random sampling technique was employed because this technique has the advantage of maintaining the representation of the desired variables. Besides it makes it easier to compare variables and helps reduce the sampling error. Since a representative sample could be obtained from the accessible population, findings from the sample could be generalized (Glover 2005).

For statistically adequate sample size, the study followed what is mentioned by Roscoe (1975) who stated that selecting a sample size of 30 ensures the benefits of central limits of theorem (the phenomenon in which sample values tend to be normally distributed around the population value). He argues that for most behavioral researches a sample size of 10% will be adequate.

## **4.3 Methods of data analysis**

The statistical analysis commenced through exploratory manipulations of the data obtained in the study area. This process was undertaken by critically examining the data through the use of simple techniques of analysis. Data collected were coded, computerized and analyzed on a personal computer (laptop) using the Statistical Package for Social Sciences (SPSS) for windows, version (16). Descriptive statistics is a useful analytical tool

enabling the researcher to examine the characteristics, behavior and experiences of the study participant. Chi square was done. This is a statistical tool used to compare observed sample frequency with expected frequency, to determine whether or not the difference between them is statically significant.



# **CHAPTER FIVE**

## **RESULTS AND DISCUSSIONS**

### **5.1. General**

This chapter deals with the interpreting and discussion of results obtained from the data collection during the survey in Gedarif states. The chapter covers the forest policy in Sudan, laws and legislations, the socio-economic characteristics of the local communities, relationship of local communities with forest, reasons of forestry deterioration and the international conventions related to forest resources.

### **5.2. Socio-economic characteristics of the communities**

A number of characteristics are associated with local people in Gedarif State. The State is of high resources potential that provide multiple benefits on which the livelihood of many groups of people depends. The forest resource of Gedarif State provides many socio-economic and environmental benefits.

#### **5.2.1. Local communities age Groups**

According to the result of local communities age, table (1) indicates that, the highest percentage (30%) were for the age between (30-40) two, followed by (26%) for the age between (30-40) years, and lastly (22%) for age between two categories (18-30) and more than 50 years.

**Table 1: villagers according to age groups**

<b>Age</b>	<b>Frequency</b>	<b>Percent</b>
18-30 years	34	22%
30-40 years	43	30%
40-50 years	39	26%
More than 50	34	22%
<b>Total</b>	<b>150</b>	<b>100%</b>

The result in table (1) shows that the majority of age groups are with (30-40) which indicate that this is the most active and participation in forest conservations and protection. Garforth (1998) showed that when a large percentage of the population is young that means extension should prepare them for the future. About (22%) of respondents were more than 50 years old, this group had the knowledge and had experience in traditional natural resources management; better participate in forest management to achieve the sustainability.

### **5.2.2. Educational level**

The educational levels of the villagers were classified into five categories, which were illiterate, khallwa (Islamic school to learn holly Quran), primary, secondary and higher education. table (2) explains that the majority of the investigated respondents were illiterate (27%), followed by Khalwa (26)%, then (23)% of them had primary level of education, while (21)% of them are within secondary education level, then university (2)%, and only (1)% had higher education level.

**Table 2: Education of the villagers**

<b>Educational level</b>	<b>Frequency</b>	<b>Percent</b>
Illiterate	40	27%
Khalwa	39	26%
Primary	34	23%
Secondary	33	21%
University	3	2%
Higher ed.	1	1%
<b>Total</b>	<b>150</b>	<b>100%</b>

The result in table (2) shows that there were a high percent of illiteracy and Khalwa in the study area. These results agree with Ibrahim (2002) and Kobbail (2005) who stated that the rate of illiteracy is high in the study area. They indicated that, the high rate of illiteracy among respondents may be due to insufficient numbers of schools in the study area. High illiteracy is one of problems facing the development of local communities and sustainable forest management. Sudarmadi et al. (2001) stated that in a comparison to uneducated people it was found that the educated group had a better perception, detailed Knowledge, greater awareness and better attribute regarding environmental problems. The improvement of the education level can be linked with their understanding of the forest importance. Otherwise, they will not be aware of the destruction of forests cover that led to environmental deterioration in the area.

### 5.2.3. Source of income

The results in table (3) expresses that there were very high significant differences in sources of income among local communities. About (61%) of the respondents considers farming as the main activities, while(15%) practiced trading , then (11%) were government employees, and (10%) had other jobs, and only (3%) were animal rearing. But in most cases the jobs were related to agricultural activities, these results confirmed that Gedarif State depends on economies of agriculture.

**Table 3: Sources of income**

Type	Frequency	Percent
Farming	91	61%
Trading	23	15%
Employment	16	11%
free jobs	15	10%
Animal rearing	5	3%
<b>Total</b>	<b>150</b>	<b>100</b>
Chi-Square		387.267
Df		9
Sig		.000
Level significant		***

The study found that the main source of income in Gedarif State was farming. These results were consistent with the findings of ( Treitz and Narain (1988), Ibrahim ( 2002), Glover (2005), Kobbail (2005) and Elmadina ( 2006) who also found out that agriculture and sale of agricultural products are the main sources of income for the people in Gedarif State.

### 5.3. Relationship of local communities with forest

#### 5.3.1. Local communities benefits of forest

Table (4) indicates that about 89% they have benefits of forest while 11% said they have no benefits of forest. Chi square test indicated highly significant among the two groups. About 68% were benefited of forest by agriculture, grazing, fuel woods and fruits; about 21.6% of respondents stated that they were benefited of forest by fuel woods, grazing and fruits, only (9.6%) of respondent were reported it by nice air only (table 5).

**Table 4 Local communities' benefits of forest**

Responses	Frequency	Percent
Yes	133	89%
No	17	11%
<b>Total</b>	<b>150</b>	<b>100%</b>
Chi-Square		89.707
Df		2
Sig		.000
Level significant		***

**Table 5: Table 5the important of forest Benefits to local communities**

Forest benefits	Frequency	Percent
agriculture, grazing, fuel woods and fruits	85	68%
fuel woods, few, grazing and fruits	27	21.6%
Nice air	12	9.6%
<b>Total</b>	<b>124</b>	<b>100%</b>

From these result is clear that most of the respondents who live in and around forests depend on the natural forests and the multiple benefits provided. The FNC is responsible to regulate all forms of utilization in order to maintain the production and protection roles of the forest resources. This implies that FNC in Gedarif State has to regulate and secure the access and entry of the local people to the benefits and privileges provided by the forest law. It should also establish a production system that meet the various needs of forest product, and conserves the forest capacity to regenerate naturally and protect the environment.

Results also showed that the local people in the study area were in practice the main beneficiaries of forestry, legally or illegally using the land inside the forests for farming, wood gathering and grazing. They may have no access to land other than the natural forest reserves because all lands outside the reserves are becoming either nonproductive or mechanized farms owned by rich merchants.

### **5.3.3. Local communities' participation in forest conservation**

The results in table (6) expresses that there were highly significant differences between respondents' according to their participation in forest protection and conservation. About 83% of the interviewed respondents were not participating in forest protection and conservation and only about 17% of them who participated in forest conservations and protections. According to the ways of local people participation in forest protection and conservation, table (7) shows that there were very high significant differences among the local communities investigated. The majority of the respondents about 58% depend mainly on fire control for forest protection and conservation, followed by 15% said there were participating in forest

protection and conservation by prevent illegal felling, also 15% were participating by fire control, prevent illegal felling and police notification, followed by 8% of the respondents said that were participating by Police notification, and only about 4% of them were participating by guarding the forest.

**Table 6: participation of local communities in forest conservation**

<b>Responses</b>	<b>Frequency</b>	<b>Percent</b>
No	124	83%
Yes	26	17%
<b>Total</b>	<b>150</b>	<b>100%</b>
Chi-Square		170.04
Df		2
Sig		.000
Level significant		***

**Table 7: Roles of local peoples in forest protection**

<b>Ways of protection</b>	<b>Frequency</b>	<b>Percent</b>
Fire Control	15	58%
Prevent illegal felling	4	15%
Fire Control, Prevent illegal felling and Police notification	4	15%
Police notification	2	8%
Guarding	1	4%
<b>Total</b>	<b>26</b>	<b>100%</b>
Chi-Square		50.923
Df		7
Sig		.000
Level significant		***

#### 5.3.4. Participation of popular committees in forest protection

The results in table (8) expresses that there were highly significant differences between respondents' according to their participation of popular committees in forest protection and conservation. The highest percentage of respondents 96% said the popular committees were not participating in forest protection. About only 4 % of them stated that they were participated in forest protection. The highest percentage of respondents investigated about (50%) said there were participating in forest protection by preventing illegal felling, about (40%) of them stated that they were participating in forest protection by police notification, while only (10%) were reported that they participated by extension campaigns (table (9)).

**Table 8: Participation of popular committees in forest protection**

<b>Response</b>	<b>Frequency</b>	<b>Percent</b>
No	144	96%
Yes	6	4%
<b>Total</b>	<b>150</b>	<b>100%</b>
<b>Chi-Square</b>		45.563
<b>Df</b>		1
<b>Sig</b>		.000
<b>Level significant</b>		***



**Table 9: Roles of popular committees in forest protection as response by respondents**

<b>Ways of protection</b>	<b>Frequency</b>	<b>Percent</b>
Prevent illegal felling	5	50%
Police notification	4	40%
Extensionally	1	10%
<b>Total</b>	<b>10</b>	<b>100</b>

According to the results of the study, the majority of the local respondents said that they were not participating in forest conservation and protection. Ibrahim (2002) found that only about 45% of respondents participate in the forest protection in Gedarif State. In the group discussion, local leaders confirmed that, the role of popular committees and local people in forest conservation was weak. This is mainly due to the weak relationship with Forests National Corporation (FNC) authority, weak contact between the staff of FNC and people committees and absence of the extension. On the other hand FNC does not put great attention for local people essential needs or plan for providing them in a rational way. In addition, local people and leaders considered the existing management are implemented in isolation from people's needs, concerns and problems.

Kobbail and Elfeel (2012) added that, despite the strengths at a local level and promising programmes currently underway, there remains an overall negative picture with regard to policy implementation. Although existing policy is not without fault, it is the system itself, and the drivers of that system, that are the major causes of failure. Not only is there a significant lack of trained forestry personnel, but many currently employed in critical

roles have attitude that is not conducive to cooperation and progress on a local scale.

Working with residents, listening to and understanding their concerns and viewpoints require patience and behavioral knowledge and skills that may be lacking in current professionals. Working closely with local residents is sometimes the last choice of many traditional foresters. In addition, inadequate funding can seriously undermine implementation of positive forestry practices. Sustainable forest management requires the active participation, integration and coordination of every stakeholder, from planning to implementation.

Abdel Magid and Mohamed (2013) stated that the 1986 Forest Policy Statement also responded to the new concepts that emerged since the seventies that put emphasis on the multiple uses of forests, environment protection and the concept of popular participation. The Statement recognized new approaches of forest and tree tenure including: institutional, community, investment and private forests. On the other hand (Abdel Magid and Mohamed, 2007) said that the International policies and conventions call to public participation in forest conservation. The Statement of forest Principles Agenda 21 (Rio de Janeiro 1992) calls for the strengthening of public participation. It recognized the indigenous and local Knowledge in forest management. In this regard, the policy emphasized the role of community forestry and popular participation in forest management and rehabilitation.

Despite the existing of this forest policy very limited efforts were made in Elgedarif State to involve people in the management process (Ibrahim,

2002), apart from the efforts of the Fuelwood Development Project in involving people in Rawashda forest, which became the main grazing area for nomads who target Butana at the beginning of the rainy season, and back home during the dry season. The forest suffers from overgrazing, lopping of trees for animal feed, illicit felling for fuel wood and charcoal and farming making resulting in a severe lack of natural regeneration. The forest was degraded and the tree species components changing.

The Forests National Corporation and the fuel wood development project were continuously trying to improve the management systems in which El Rawashda and Wad Kabo forest reserves were pilots in which different stakeholder's options were considered (Abdel Magid *et al*, 2014). Klocke (1996) indicated that, the initial inquiries show the local peoples interest and willingness in conservation and management of the natural forests, and concluded that if this is to become a project concern, it only be tackled in close cooperation with local people. Local leaders could adequately be empowered, motivated and to be involved to share the responsibility of forest protection.

The officers investigated reported that the components of laws were very strong to allow participation of local communities in forest management.

### **5.3.5. Women roles and activities in the forests**

The result in table (10) explains that there were very high significant differences among the respondents according to women roles and activities in the forest. The result indicated that, the highest percentage of respondents about 72% have not any activities and relationship to the forest, while 28% of respondents said there have activities and relationship to the forest.

According to important of women activities in forest, table (11) shows that the majority of the respondent about 46% were depend mainly on planting seedlings in house nursery, followed by 35% of were collecting firewood, and fruits, followed by 19% were depend on the agriculture.

**Table 10: Women roles and activities related to forest as response by respondents**

<b>Responses</b>	<b>Frequency</b>	<b>Percent</b>
No	108	72%
Yes	42	28%
<b>Total</b>	<b>150</b>	<b>100%</b>
<b>Chi-Square</b>		29.04
<b>Df</b>		1
<b>Sig</b>		.000
<b>Level significant</b>		***

**Table 11: The important of women activities in forests as response**

<b>Women activities in forest</b>	<b>Frequency</b>	<b>Percent</b>
Planting seedling in house nursery	17	46 %
Collect the firewood, woods and fruits	13	35%
Agriculture	7	19%
<b>Total</b>	<b>37</b>	<b>100</b>

The result in tables (10,11) shows that the majority of women had an activities and relationship with forest. Those were planting seed in nursery

house and carrying in to forest with agreement with Forest National Corporation by incentive (pilot projet). There for the current study show those local women in the study area were willing to participate in future tree planting and they contribute in the sustaining the forests management. Then the government needs to adopt new policies and laws at providing an enabling framework for the participating the women in sustainable forest management. At the same time they collect fuel wood, wood, gum Arabic and fruits, this should be supported by intensive extension programmes.

The International policies and agreements encourage women to participate in forest conservation. The Statement of forest Principles Agenda 21 (Rio de Janeiro 1992) calls for the participation of woman in the management and conservation of forests (Abdel Magid and Mohamed, 2007). Identification of social, cultural and gender issues in Alain area Northern Kordofan perform different activities, interests, needs, knowledge and priorities regarding natural resource products, this indicates the importance of considering the social and institutional aspects and understanding the social and economic dimensions, in order to conserve and protect the natural resources. From this angle emerged the notion of gender and gender-based analysis which call for the consideration of women in activities related to natural resources (Mohammed, 2010).

### **5.3.6. Conflicts related to forest utilizations**

There were very high significant differences among the respondents according to their conflicts related to forest utilization. The study reveals that the majority (72%) of the household heads interviewed were agreed to the existing of forest resource conflicts, while very few of them (28%) stated that there were no conflicts (table 12). Result in table (13) indicates that

there were highly significant differences between respondents. The majority of the respondents 39% confirmed the existing of conflicts in agriculture, fuel woods and grazing, while 23% mentioned conflicts in agriculture and grazing, followed by 13% who stated agriculture and fuel wood and only 4% who mentioned fuel or grazing only.

**Table 12: Conflict related to forest utilization**

<b>Responses</b>	<b>Frequency</b>	<b>Percent</b>
Yes	108	72%
No	42	28%
<b>Total</b>	<b>150</b>	<b>100%</b>
Chi-Square		29.04
Df		1
Sig		.000
Level significant		***

**Table 13: Reasons of the forest conflicts**

<b>Reasons of the forest conflicts</b>	<b>Frequency</b>	<b>Percent</b>
Agriculture, Fuel woods and grazing	42	39%
Agriculture and grazing	25	23%
Agriculture	19	17%
Agriculture and Fuel woods	14	13%
Grazing	4	4%
Fuel woods	4	4%
<b>Total</b>	<b>108</b>	<b>100%</b>
Chi-Square		59.171
Df		5
Sig		.000
Level significant		***

Most of these conflicts occurred among the local people and some between local people and Forest National Corporation (FNC) in Elgedarif State, In the group discussion with officers and local leaders, the author realized that most of the conflicts between local people are due to poor land use system and it is most common between nomads and farmers who prevent the nomads from entrance with their animals into the area. Local leaders argued that FNC does not arrange to consult them in the management of these forests. It also neglected the rights and the well-being of the local people. They added that corruption among some forestry officials is more common especially with firewood when FNC used to confiscate any woods without official papers.

With regard to how local people deal with conflict still local leaders play a vital role in smoothing tension to solving many associated problems. But, the main causes always remained unsolved; this is why conflicts tend to arise from time to time when certain factors intervene. The compromised solutions made by local leaders are many: ranging from simple compensation of losses to complex agreements involving other authorities.

Most of the local communities believed on the local leaders' inherent knowledge and experiences to handle the different problems they face over the use of forest resources either on their traditional way (*Rakooba*) or in collaboration with other authorities. FNC in some areas and in some cases depends totally on local leaders, besides employing the forest act through the local traditional court, and through higher level courts when dealing with what is considered a major forest crime. However, the main causes of conflicts over the forest resources always remain unsolved or not adequately treated through proper management plans, especially in natural forests. From

the above discussion it is clear that the major reasons for policy failures include beside institutional and management deficiencies it also include, lack of political commitment, inappropriate policy instruments, ineffective involvement of relevant stakeholders, poor coordination, corruption and land use conflicts. All these reasons can have significant negative effects on management sustainability.

### **5.3.7. Forest deforestation and deterioration**

The results in table (14) expresses that there were highly significant differences between respondents of the reasons of forest deforestation and degradation. The majority 92% of the respondents agreed to the existence of forest deforestation and deterioration, while only about 8% of respondents did not agree for it.

The results in table (15) expresses that there were highly significant differences between respondents. The majority of the respondents 30% mentioned that the main reason of deforestation and deterioration were the agricultural expansion and agricultural investment, while 27% of investigated respondents reported that over grazing, cutting trees and agricultural expansion, the next 20% of investigated respondents said that the weak reforestation and agricultural incursion, followed by 16% of investigated respondents for no coordination among officials, weak patrolling and mismanagement, and lastly only 7% of respondents reported that due to downfall of rain fall and drought.



**Table 14: Forest deforestations and deteriorations**

<b>Responses</b>	<b>Frequency</b>	<b>Percent</b>
Yes	138	92%
No	12	8%
<b>Total</b>	<b>150</b>	<b>100%</b>
Chi-Square	195.84	
Df	1	
Sig	.000	
Level significant	***	

**Table 15: Reasons of forest reforestation and deterioration**

<b>Reforestation and deterioration reasons</b>	<b>Frequency</b>	<b>Percent</b>
Agricultural expansion and Agricultural investment	45	30%
Over grazing, illegal felling and agricultural expansion	40	27%
Week reforestation and Agricultural incursion	30	20%
No-coordination among officials, week patrolling and Mismanagement	25	16%
Drought and Rain fall	10	7%
<b>Total</b>	<b>150</b>	<b>100%</b>
Chi-Square	115.051	
Df	9	
Sig	.000	
Level significant	***	

It is clear that the major cause of forest deforestation and degradation in the study area is agricultural expansion and agricultural investment. Abdalla, (2012) declared that mechanized farming expanded all over Elgedarif state legally and illegally. Local leaders explained that this great expansion of

mechanized farming has cleared most of the forested area. This result is confirmed by Eltayeb and Lewandowski (1983), Abdalla (1987), Glover (2005) and Elmadina, (2006) who stated that illegal cutting for fuel wood and excessive clearance for agriculture by mechanized scheme farmers have disseminated the forest resources in Elgedaref State.

The area is also inhibited by refugees who add another burden to the forest area, where they cleared the forest land for their farms; cutting down trees for housing, fuel wood and livestock fodder this expanded from the south of Elgedarif town, up to the Ethiopian borders, except for very few reserved forests. In addition to nomads who are spent more than two month inside the forest to feed their livestock. They also depend on fire wood and charcoal as the source of income (Fngama, 2006). Atta Elmoula (1985) reported that the commercial charcoal production also contributed to the wide- spread deforestation in Elgedarif State. Abdalla (1987) recorded that about 98% of the charcoal production in Sudan in 1979 – 1980 was from the Central and Eastern Region and about 72% of the total production were from Elgedaref State. Political factors also participated in forest deforestation; for example, forestry sector has been subjected to transfer from the Ministry of Agriculture and Animal Resources to the Ministry of Agriculture and Natural Resources, then to Tourism and the Environment and then Environment and Forestry, and last to Agriculture and Forestry.

The concern over the forest resources, their exploitation, protection and development was initiated by the establishment of the Woods and Forests Department in 1901. Hereafter the department continued to develop professionally and technically to reach the level of the Forests National Corporation (FNC) in 1989 (Abdel Magid, 2018). So these changes may

affect the decisions, plans and performance of forest undertakings. Sudan has experienced political instability for a long time and a lot of tribal conflicts which are continuing up to date and led to deterioration of forest resources (Bayoumi, 2001). FAO (2006) reported that the forest degradation in Sudan is a result of the lack of an appropriate legal framework that leads to proper utilization and wise use of natural resources. Eisa (1996) and Elasha (2002) stated that misdirected government policies, lack of public awareness, weakness of legislation, economic activities are among main causes of degradation of vegetation. Elmahi and Abdel Magid (2002) stated that the deterioration of forest resulted from the Government who laid the policies alone and was very responsible for their implementation did not show enough commitment to see them executed.

Kobbail (2005) indicated that management for sustainability will first be concerned with securing an improved livelihood for the present generation, while maintaining the potential of forest heritage for future generations. Meanwhile, the forest potential must be seen within the broader context of rural development, in which the allocation of land to different uses is part of a dynamic process but where a balance is maintained between forests and other forms of land-use in which trees have a role. And above all responsibility of management must be clearly identified and competing interests must be reconciled through dialogue and partnership (Murray, 1993 cited by Kobbail, 2005). It is now seen as multipurpose management of the forest, which means that its overall capacity to provide goods and services is not diminished (FAO, 1993 cited by Kobbail, 2005).

### 5.3.8. Forestry Extension

The results in table (16) expresses that there were highly significant differences between respondents in receiving extension services. The majority (66%) of the respondents in the study area reported that they did not receive extension services. On the other hand very few respondents (34%) received extension.

Chi square test indicated highly significant deferent in the type of extension services received where (82%) were received extension services by meeting, (8%), Television, followed by (6%) by radio and meeting and finally only (4%) by radio (table 17).

**Table 16: Forestry extension campaigns**

Responses	Frequency	Percent
No	99	66%
Yes	51	34%
<b>Total</b>	<b>150</b>	<b>100%</b>
Chi-Square		15.36
Df		1
Sig		.000
Level significant		***

**Table 17: Ways of forestry extension**

Ways of forestry extension	Frequency	Percent
Meeting	42	82%
Television	4	8%
Radio and meeting extension	3	6%
Radio, television and meeting	2	4%
<b>Total</b>	<b>51</b>	<b>100%</b>
Chi-Square		164.000
Df		5
Sig		.000
Level significant		***

In 1987 the extension services were introduced in Sudan by Forests National Corporation. The objective of forestry extension services in Sudan is to create awareness among local people about the benefits of forests and trees both in providing essential products for their daily needs and protecting the environment (Ibrahim, 2007). According to the respondents, the extension agents paid visits to the village leaders or the popular committees in the villages in order to pass the message to local people. This reveals that the role of the extension is poor and extension advice appears to be lacking in the study area. This may be due to lack of facilities and financial resources.

One of the extension officers in the study area recorded the sad impression by telling: “The forest department, which was supposed to disseminate information through extension services, was itself helpless in providing enough budgets. Extension department did not have sufficient resources to administer its role in forest protection, raising awareness and disseminate information”. Also many of the extension staff members indicated that seniors’ staff rarely shows interests in extension activities. An extensionist expressed that by saying: “We do not know whether they used to read our reports, we do not receive any comments. They do not ask about or see our activities unless an important visitor or an evaluation team is coming”.

According to Abdel Nour (1991) cited by Kobbail (2005) the 1932 forest policy has been revised in 1986 and stresses the importance of forestry extension. Despite this, not many practical actions are being taken to allocate reasonable resources for the extension division. Hence, it remains not working and this is clearly reflected by our research findings. It could be concluded that the effectiveness of the extension workers depends on a

variety of factors. The most basic requirement for the success is access to transportation and enough budgets.

Kobbail (2005) added that the importance of extension services cannot be over emphasized, however, it helps a lot in knowledge transmission to local people which are of direct relevance to them. It also helps in carrying feedback from the local people to the authorities and thus operates a two-way communication system. Because most of the respondents in the study area are illiterate, the extensionist could play a crucial role in communicating modern technology to the local people in an appropriate way. Kobbail (2005) further stated that the role of forestry extension should be strengthened to enable extensionist pass as many visits as possible to the local people in their villages and at an appropriate intervals. Extension activities should concentrate on management of reserved and protected natural forests. Extension should be given more emphasis as a tool to enhance people participation

### **5.3.9. Practices and activities existing in forests**

There were very high significant differences between respondents according to practices placing in the forests. Result in table (18) indicate that the highest percentage of respondents (41.9%) who said that the agriculture, grazing and theft occurred into the forests, while (35%) of the respondents said the agriculture, grazing, theft and kiln were occurred, while 20.2% of the respondents reported the agricultural practices only, and 2.9% of investigated respondents thought the grazing and theft occurred into the forest.

**Table 18: Practices and activities existing in forest**

<b>Practices in forest</b>	<b>Frequency</b>	<b>Percent</b>
Agriculture, grazing and theft	56	41.9%
Agriculture, grazing, kiln	47	35%
Agriculture	27	20.2%
Grazing and theft	4	2.9%
<b>Total</b>	<b>134</b>	<b>100%</b>
Chi-Square	198.060	
Df	7	
Sig	.000	
Level significant	***	

In the group discussions with local leaders they stated that there were some practices and activities existed in the forest such as agriculture, grazing, kiln, fuel woods and thieveries. These mean that forests facing an inclemently attack of local people, which lead to deforestation and forest deterioration.

In practice many factors affect the behavior of the users, e.g. the competition over the resources, access regulations' and contraction of interest and prevention of local people from entering forest reserves. Although access to the forest is one of the purposes of formal government management it is usually leads to conflicts between the local people and the forest guards and officers.

### **5.3.10. To conserve the forest in the study area**

Results in table (19) shows that about (44%) of respondents proposed that prevention of agricultural expansion, followed by 26.5% who proposed local communities participation in forest management, About (18%) of the interviewed respondents proposed putting law stocked for forest protection,

while 9% suggested providing alternatives of energy and only 1.5% proposed mending management for sustained forest.

**Table 19: Propositions of forest conservations**

<b>Suggested methods of forest conservations by respondents</b>	<b>Frequency</b>	<b>Percent</b>
Prevent agricultural expansion	60	44.7%
Participated local communities in forest management	36	26.5%
Putting law stocked	24	18.3%
Provident alternatives of energy	12	9%
Mending management	2	1.5%
<b>Total</b>	<b>134</b>	<b>100%</b>

## 5.4. Forest laws

### 5.4.1. Respondents awareness of Forest laws and Laws content

According to table (20) the study revealed that the majority (84%) of the household heads interviewed were aware about the forest law and its content; whereas (16%) of the respondents were not aware about the forest laws and its content. Chi square test indicated the difference was highly significant.

**Table 20: Respondents Awareness about forest laws and its content**

<b>Response</b>	<b>Frequency</b>	<b>Percent</b>
Yes	126	84%
No	24	16%
<b>Total</b>	<b>150</b>	<b>100%</b>
Chi-Square		69.360
Df		1
Sig		.000
Level significant		***



The local people in the study area were knowledgeable of the forest laws and regulations and they were recognized the need of acquiring licenses of permission from FNC authorities prior to tree cutting. However, very few of the respondents were not Knowledgeable of the forest law, especially for seeking permission before cutting trees. These results mean that most of local people in the study area have a good idea about the forest laws and regulations. This level of awareness of local people is not due to the presence of FNC authorities in the area, but from local leaders who enforce penalties for illegal cuts. The advantage of taking licenses to cut tree is useful for conserving the forests because the licenses are usually given for a definite time and then limits the number of trees to be cut and prohibit any other access to the forest.

About (56%) of respondents said that the laws contain high financial fine followed by (32%) who mentioned prevention of illegal cutting, and only (12%) of them believed that forest laws content include financial fine and confiscate of fuel woods. For those who were not aware about the contents of the forest the reason may be attributed to the lack of extensions role in the State. However, the respondents stated that forest laws contents were not able to protect forest, it prevents illegal cutting without laying alternative.

#### **5.4.2. Respondents a awareness of penal and wrongdoing of forest laws**

Result in table (21) indicated that about (66%) of respondents said that they have knowledge of penal and wrongdoing of forest laws, while 34% of them said they haven't any knowledge of it. Chi square test revealed that the differences were highly significant between respondents knowledge.

**Table 21: Knowing of local communities in penal and wrongdoing of forest laws**

<b>Responses</b>	<b>Frequency</b>	<b>Percent</b>
Yes	99	66%
No	51	34%
<b>Total</b>	<b>150</b>	<b>100%</b>
<b>Chi-Square</b>		15.360
<b>Df</b>		1
<b>Sig</b>		.000
<b>Level Significant</b>		***

Based on these results and with regards to forest conservation, government should facilitate establishment of property systems by defining groups in delineated areas and with rights of inclusion and exclusion. In this, actors will be effective and sincere in managing and conserving forest resources in a sustainable way. What are needed; is not only regulations, but also cooperation with regulations. Government can help local indigenous institutions; provide a legal framework and perhaps technical assistance. “The law should make it possible, for local collective action organizations to obtain legally enforceable recognition of their identity and rights within the society and to call up on the state as an enforcer of last resort” (Suleiman 1996).

#### **5.4.3. The effectiveness of forest laws**

Table (22) explains that there were no significant differences between respondents according to the efficiency of forest laws. The results revealed that about (54%) of the respondents stated that, the forest laws were not being effective to protect and conserve the forests, while (46%) of them said that forest laws were effective.

According to the reasons to prevent forest laws to being effectively, table (23) stated reasons for the ineffectiveness of the forest laws mentioned by the respondents were (48%) law was not able to protect forest. This followed by (26%) of them who mentioned there were Laxity in law implementation, followed by (14%) of them who stated that forest laws were deterrent, then only about (12%) that said the law was prevent illegal cutting without laying alternative.

**Table 22: Awareness of forest laws effectiveness as indicated by respondent**

<b>Response</b>	<b>Frequency</b>	<b>Percent</b>
No	81	54%
Yes	69	46%
<b>Total</b>	<b>150</b>	<b>100%</b>
<b>Chi-Square</b>		0.960
<b>Df</b>		1
<b>Sig</b>		.327
<b>Level significant</b>		not sig

**Table 23: Reasons prevent effectiveness of forest law as indicated by respondents**

<b>Reasons of not laws effectively</b>	<b>Frequency</b>	<b>Percent</b>
Not able to protect forest	36	48%
Laxity in law implementation	20	26%
Deterrent law	11	14%
Prevent illegal cutting without laying alternative	9	12%
<b>Total</b>	<b>76</b>	<b>100%</b>

In the group discussion, community leaders stated that, Forest laws usually lay bunched to implement the policy without providing an alternative energy source like gas to make the need for fuel wood and charcoal. The local people considered forest laws are uncurbed and deterrent and are not suitable instrumented to implement policies and do not achieve the forest conservation. However the forest laws were sectorial fragmented and lack comprehensiveness look to the overall environment. Therefore intensive efforts should be exerted to improve these laws by formulating an umbrella law with strong policy orientation that provides a basis for coordinated work.

#### 5.4.4 Participation of local communities in forest laws implementation

The results in table (24) expresses that there were very high significant differences between respondents regarding participation in forest laws implementation. The result revealed that the majority (97%) of the local people said they did not participate in forest laws implementation and few of them only about (3%) said they participated in forest laws implementation.

**Table 24: Participation of local communities in forest laws implementation as indicated by respondents investigated**

Response	Frequency	Percent
No	146	97%
Yes	4	3%
<b>Total</b>	<b>150</b>	<b>100%</b>
Chi-Square		134.427
Df		1
Sig		.000
Level significant		***

The form of participation varies from extension to police notification. Interview with officers indicated that, there was lack of law implementation, this due to lack of infrastructure, inability to move to forest crime. There are also some difficulties that prevent the implementation of the forest laws such as: poverty, choiceness, unawareness of local communities to forests importance and forest laws, leniency of administrations in laws implementation, political interjecting of politicians men like mayor and governor in forest crimes; and misjudging of Judges to forest laws; nothing exist or specialized for natural resources protection in the Ministry of Justice. They added that weak movement expedient to FNC and there is procrastinating to implement forest crime, and minor government care to environment issues. Extensive efforts are needed for the statehood to facilitate forest laws implementations.

- The forest policy 1986 includes involvement of local communities in policy formulation (Elmahi and Abdel Magid, 2002). Communities can be involved in policy implementation through laws applications. In the study area local leaders and public committees are recognized as tools in policy implementation through local supervision and laws application. Even local community courts are recognized by forest law as authorized bodies. From the group discussion carried out by officers it was noted that participation of the local people in forest laws implementation is repeatedly referred to, but in practice, it does not exist.

## **5.5 Analysis of Policies in Sudan**

In order to determine current conditions relative to forest policy formulation and implementation, and to identify the causes of the depletion of forests, and forest resources, in Sudan data were collected from forestry

professionals (expert group survey) through (i) a questionnaire survey and (ii) personal discussions. Most of the officers believe that the 1932 Forest Policy was formulated under special circumstances, during the colonial regime; the governor general signed the policy document in the presence of his financial, administration and legal secretaries. That gave the policy the power for execution, the policy covered all executive, financial and legislative matters. Issuing written forest laws was an indicator to the importance of the national role of forest in the well-being of the people and community economics as well as the environmental role.

The failure of 1932 Forest Policy was mainly due to institutional difficulties related to the division of power in the forestry sector between central and provincial authorities. For this end so many approaches and scientific techniques and administrative procedures have been followed in order to distribute responsibilities between the center and Sudanese regions concerning the management of forests. Elmahi and Abdel Magid (2002) enumerated other drawbacks related to provincial authority showing their lack of commitment portrayed by meager budgetary allocations, tendency to over cut and weak staff performance. Nonetheless, the central government should be also blamed as it approved the replacement of millions of feddans (1 feddan equivalent to 0.042 hectare ) of forest by mechanized agriculture paying no attention to the importance of the coordination of policies in the two sectors (forestry and agriculture).

Therefore, there was a need to amend the 1932 Forest Policy; this amendment took place in 1986. (Ibid) stated that amended forest policy of 1986 did not have the strength of the 1932 policy because it was formulated rather hurriedly and ignoring other sectors, it was formulated without any

coordination with other land-use policies and without financial support. Although both policies (1932 and 1986) aimed at the conservation and improvement of the forest resources, they did not result in satisfactory outcome (Ibid).

The previous analysis indicated that the result of both policies (1932 and 1986) were following: Deterioration of forest cover from 34% to 10.1%; The reservation of less than half of a percent of the total area of the Sudan (1993) as compared to 15% and 20% stipulated by the 1932 and 1986 policies respectively. Both forest policies were formulated indoors by forestry professionals alone without consultation with all other relevant actors. This has led to the lack of commitment among other stakeholders and lack of political will that required for their enforcement. Both policies lack the tools required for their implementation and necessary elements of monitoring and evaluation (Elmahi and Abdel Magid, 2002). Also Omer et al, 2017 stated that, in most policy making process in the forest sector over the last three decades, statements were formulated by foresters alone without participation by other stakeholders (such as the private sector, NGOs, local and community groups, professional associations, etc.).

As a result, most policy statements aimed at sustainable forest management through FNC forest reservation, protection and tree planting. Other stakeholder such as those of agriculture, range and wildlife should have been included. Yet they have their own sectoral policies that equally lack complementarity with the forest policy and the different policies sometimes directly contradict.

There is essential need for sustained partnership between all actors at local, national, regional and international levels in management, rehabilitation and reconstruction processes. Therefore the coordination at the national level is very essential to ensure consistency in the natural, economic and socio-economic environmental policies through regular communication between FNC and the other related sectors, and to increase exchange of information and consultation. The appropriate coordination will facilitate linkages horizontally with other sectors and vertically, between the different levels. This coordination is preferred to be from high-level political body. The forest policy 1986 included the involvement of local communities in policy implementation. Communities can be involved in policy implementation through laws applications. The author realized that local leaders and public committees are recognized as tools in policy implementation through local supervision and laws application.

The proposed policy of 2006 defined as Sudan National Forest policy Statement, it was developed and technically support by FAO. This policy is a recent update of Sudan's Forestry Policy 1986. The 2006 Statement, which has not yet been ratified, Prioritization of issues and concern raised by stakeholders

- Good governance of the forest sector;
- Improving people's situation;
- Desertification
- Greening Sudan
- Forest industries
- Land disputes.
- Energy and oil.



- Maintenance of biological awareness
- Non-timber forest products.

The 2006 draft Forest Policy was not passed on to the political level.

Even within the Sudanese forestry elite it was heavily criticized in terms of policy contents – though not the process (Abdel Magid and Abdelhai, 2018). Generally, the Forest Policy in Sudan was lacking a comprehensive policy and legislative framework that deals with land use in an integrated way (Atta Elmoula 1985, Tolentino (1994). Rather, there are a number of individual sectoral policies e.g. agriculture, forestry, wildlife and other resources. Therefore the majority of officers in this study declared that the professionals in departments or other sectors e.g. Agriculture, Range and wild-life who compete for the same land resources were never asked by the foresters to participate in the formulation of the forest policies although they mentioned their knowledge of the existences of such policies. Government laid the policies alone and was very responsible for their implementation did not show enough commitment to see them executed.

Elnasri (2002) stated that forest policies in the Sudan laid emphasis on described the resource problems, indicating the objectives and directly emerging in to setting the courses of action. They look like a law without a stick let alone having a carrot. The forest policy in Sudan ignored supportive elements for implementation like policy tools and also lacking a built in system of monitoring and evaluation of the results that is imperative as a guide for policy revisions (Elmahi and Abdel Magid (2002 cited by Kobbail, 2005).

Some key policy feature of sustainable forest management is a commitment by government to define, and defend a permanent forest estate based on securing long term land tenure for communities, concession holders and other forest users (Elsidig, 2004). Forest land is a basic principle and a prerequisite for sustainable management (Elsidig, 2003). Hence an appropriate and reliable form of forest and land tenure should be established by legislation, including various forms of forest ownership and usage right (Kobbail, 2005).

Considering the fact that the policy emphasizes the environmental role of forest, exemplifies the extent of discrepancy between the policy statement and its implementation. Therefore, the officers believe that forest policy need to support and backing from the state to developed.

Forest land is a basic principle and a prerequisite for sustainable management. Hence an appropriate and reliable form of forest and land tenure should be established by legislation, including various forms of forest ownership and usage righ (Nanayakkar, 1993).

As in the state forest policy in Gedarif State generally called for the protection and conservation of the natural forests. But management in Gedarif State has always been directed to the national objectives (soft timber production) without adequate consideration to the natural forests and the local interests which are mainly dependent on them.

A planning and finance authority that ought to integrate these policies in the national economic system and provide the resources necessary for policy implementation is totally excluded. As for the public, such documents considered the government domain and are hardly public concern.

From the group discussion carried out with officers it was noted that participation of the local people in decisions related to forest management is repeatedly referred to, but in practice, it does not exist. The officials interviewed said that the forest administration has a clear plan to improve forest laws and legislations and to implement this plan is clear. The officers showed that there was actually participating of the local leaders in outlying the forest plan.

#### **5.4.7. Sudan Forest Laws**

Forest Legislations and Laws is one of the important institutional elements for the development expansion of the forest sector. It provides the structural framework within which national forest policies are set and in turn reflect or should reflects their objectives and priorities (Schmithuen, 1986).The government depended entirely on the law to affect command and control, but even that failed because of inefficiency of guarding and the ineffectiveness of punishment to law breaker (Beck et al 1989) cited by (Elmahi and Abdel Magid, 2002). The comprehensive legislation is either lacking, fragmented or contradictory, moreover, laws are implemented inefficiently, all the present legislations is not coherent and consistent enough to replace the communal land tenure system that still rules most people's use of the natural resources (Kobbail, 2005).

The latter coupled with amended of Forest Policy (FP) statement (1986), led to revision of Forest Act (1989), the political and public recognition (Kanoan, 2004) and (Glover, 2005). On the other hand the officers stated that Forest laws 1989 were weak and not effective because not well implemented, but forest law 2002 for forest protection and renewable natural resources is effective. However, the environmental protection Act is an

umbrella and binding for the protection of forests and all the natural resources, it was formulated in a coordinated work of all natural resources administrations and all stockholders. In this (FAO, 2003) stated that Environment Protection Act 2001 represents an important development in harmonizing different environmental sectoral laws. It sets environmental standards, requires the injection of environmental dimension in development plans and requires that Environmental Impact Assessment (EIA) be carried before implementing any project. The Act also calls for the protection of the biodiversity, prohibit pollution, raises environmental awareness and popular participation in setting policies and decision making.

The Law of Forests and Renewable Natural Resources (FRNR) 2002 in line with FNC annual report, 2016, the number of cases that were brought to trial after the completion of investigations and the number of judgments has been very low. The weak law enforcement capacity indicated is mostly attributed to inadequate legal machinery, lack of resources and inexperience or unconcern on the part of the prosecution and judiciary (Abdel Magid and Abdelhai, 2018).

## **5.6 The coordination of forest policy and laws with other natural resources**

According to officers investigated through personal contacts and group discussions, local administrations do not collaborate with forest administration in the management of forests and the role of forest extension is rather weak. The only form of participation of the local leaders in forest management was being only by the law's implementation to protect forests. On the other hand there is weak coordination between all natural resources administration in policies and laws. Although there is some activities share

with the other sectors related to the forest management, such as, environmental protection, biodiversity conservation and wildlife protection.

Officers had deep scientific insight in that there should be synchronization between forest policy and laws and other natural resources policies and laws; with forest administration and with local regulations. Also there is no inconsistency between local regulations with federation laws; also half of officers investigated said the laws able to accommodate the relationship between FNC and state forests. Forest laws formulation integrated with other natural resources laws, with the aim of the environmental conservation but coordination is weak. They concluded that the laws usually take into account non-conflict with other laws and in the case of conflict there is a legislative remedy for the matter. The majority of officers stated that the others sectors are not cooperating with FNC to implement forest laws. There is a difficulty in coordinating laws between natural resources departments because they were affiliated to different Ministries. This verified by Elmahi and Abdel Magid (2002) who stated that Forest policies and laws in Sudan were formulated indoor by forestry professionals alone without consultation with all other relevant actors. This has led to the lack of commitment among other stakeholders and lack of political will that required for their enforcement.

However, (Ibid) reported that a forest policy in Sudan usually tackled the issue of integrating in management with other land uses and acknowledge the fact that it requires abroad intersect-oral approach at the all stages, including the formulation of policies, strategies and plan of actions, as well as their implementation, monitoring and evaluation. But the first element of a policy framework is better local coordination of natural resources administration. Planning by sectoral agencies should be closely link and

coordinated at the local level (Haj Hamed & Badi, 2004). On the other hand during forestry policy formulation, legislation should be kept in mind for a policy must not conflict with the constitution or other fundamental laws of a country (Elmahi and Abdel Magid, 2002).

### **5.7 Non-Governmental Organizations (NGOs)**

Most of the officers investigated on the role of non-Governmental Organizations (NGOs) clear that they has essential role in sustainable forest management such as the conservation of natural resources and environmental protection in general, increase productivity and activating the role of youth and communities towards environmental action and preserve the vegetation. The NGOs contribution to the forest protection laws and pro activation issues relating to prevent logging.

During the late 1970s and early 1980s, most of the reforestation activities were funded by the International Bilateral and NGOs. At this time the forestry extension was virtually ignored and led to insufficient support for private forestry, this situation of rapid deforestation, low forest service morale and inadequate budgets led to a complete reorientation of both the Forest Administration and donor policy. In spite of that mentioned the professionals of NGOs said they did not have the who have opportunity to participate in developing policies and forest laws.

### **5.8 International Conventions**

Due to national and international agreements, there was a proposal for a new Sudan forest policy drafted in 1997. This proposed policy calls for the assignment of 25% of the country are as natural resources, mainly forests, and to limit felling and the use of trees in areas where regeneration is

assured. During the period since early 1980s, international Assistance introduced management practices inside the natural forest reserves based on local people's participation with the objective of the forest rehabilitation and sustainable management considering people needs (Kobbail, 2005).

Babiker (2008a) reported the ratification of international convention gives the Sudan many opportunities: facilitating access to and transfer of technology and exchange of information, maintaining research and training, promoting international technical and scientific cooperation, and availing of financial resources on the grants. In addition, the international conventions introduced new environmental concepts, many forest departments and faculties within the Sudanese universities were established, the Ministry of Education introduced curriculum on the environment in its schools program, the contribution of newspapers, radio and television emphasizing the importance of forestry, is very noticeable. The local peoples showed more interest in tree planting in and around their houses, seedlings were distributed freely to schools and people as assort of encouragement.

Babiker (2008a) mentioned that the Sudan government is committed to these conventions and set up focal points within the Higher Council for Environment and Natural resources, to deal with the consequences of these gatherings and keep an eye on progress with this theme. Even thus there is no coordination between FNC, the higher council for the environment and natural resources and the desertification control unit.

According to group discussion officials reported thatthe international conventions have proposed working plans for implementation, but still lack of funding and coordination between the different responsible authorities,

the division of responsibilities to implement the different proposed projects i.e., who, when, and how this is done and where budget to implement it. The officers noted that Forest policy in Sudan and plans consistent with international conventions on forests.

### **5.5. Variations among the study variables related to forest policies and laws according to their significances level**

Table (28) reflects chi-square values link with significances for the variable included in the table. Ranking based on descending chi-square values indicate to what extent that variable is linked with expressing its relation of positive or negative direction to the relation with policies and laws in sustainable forest management. This will help to consider each of these variables according to this rank in action promoting the role of forest policies and laws in sustainable forest management.



**Table 25: Chi-Square values for the different study variables**

Table number	Name of table	Chi- Square value
Table (2)	Awareness about forest law contents	.154
Table (7)	Participation of local communities in forest laws implementation	.514
Table (8)	Participation of forest laws implementation	.515
Table (4)	Aware of penal and wrongdoing of forest laws	.535
Table (24)	Existing forestry extension campaigns	1.248
Table (22)	Forest deforestation and deterioration	2.174
Table (16)	Participation of popular committees in forest protection	4.167
Table (1)	Aware of Forest laws	6.250
Table (14)	Local communities' participation in forest conservation	11.468
Table (12)	Local communities benefits of forest	12.074
Table (25)	Ways of forestry extension	12.936
Table (18)	Women roles and activities in the forests	15.079
Table (5)	The efficiency of forest laws	17.552
Table (20)	Conflicts related to forest utilizations	19.841
Table (17)	Roles of popular committees in forest protection	20.743
Table (15)	The roles of local community in forest protection	25.702
Table (21)	Reasons of conflicts related to forest utilization	30.896
Table (26)	Practices and activities existing in forest	44.937
Table (11)	Source of income	47.621
Table (23)	Reasons of forest deforestation and degradation	63.576
Table (19)	Importance of women activities in forests	78.584

Table (3)	Contents of forest law	84.770
Table (6)	Reasons to prevent forest law being effectively	159.299
Table (13)	The important of forest benefits	186.120
Table (27)	Propositions of forest conservations	236.692

## CHAPER SIX

### CONCLUSION AND RECOMMENDATIONS

**According to the results, the study reached to the following conclusions:**

- Forest policy in Sudan largely ignored supportive elements such as policy tools required to facilitate implementation of policy prescriptions and lacking a built in system of monitoring and evaluation of the results that is imperative as guide for policy revisions.
- Improper land use and transformation of forest land by mechanized farmers increasing incidence of deforestation, this due to lack of coordination between two sectors (Forest and Agriculture). In general the forest policy and laws in Sudan lacking a comprehensive policy and legislative framework that deals with land use in an integrated way. However forest polices were formulated indoor by forestry professionals alone without consultation with other stakeholders (such as the private sector, NGOs, local and community groups, professional associations, etc.).
- The participation of the local people in decision related to forest policy is repeatedly referred to but in practice, is does not exist. On the other hand the participation of local people in forest protection and conservation were weak.
- Sustainable management of forest resources can be achieved if the following measures are effectively implemented: adequate access provided to local residents to forest resources; active local participation in designing conservation and resource management plans.
- In 2005 a new forest policy proposal was formulated, this amendment is still awaiting the endorsement of parliament. This new amendment

emphasized on people participation and adopted the international conventions.

- There are also some difficulties that prevent the implementation of the forest laws such as: poverty, choiceness, unawareness of local communities to forests importance and forest laws, leniency of administrations in laws implementation, political interjecting of politicians men like mayor and governor in forest crimes; and misjudging of Judges to forest laws; nothing exist or specialized for natural resources protection in the Ministry of Justice.

- The Sudan government is committed to the international conventions, therefore recommended working plans for implementation, but still lack of funding and coordination between the different responsible authorities.

- The study concluded that the forest policies and laws in Sudan usually formulated without a proper coordination among concerned stakeholders and with limited supporting fund. It is usually formulated without any enough financial support. Therefore this has led to the lack of commitment among stakeholders and lack of political wills that are required for their implementation. On the other hand forest policies lack the tools requires for their implementation, monitoring and evaluation. However forest policies in Sudan aims to Sustainable forest management but this sustainability required the active participation, integration and coordination among stakeholders from planning to implementation and evaluation.

- The Study realized that there were some difficult that prevent the implementation of the forest laws such as low awareness about the forest importance and forest laws, leniency of administration in laws implementation and political support.

- The international policies and conventions call to public participation. In this regard forest policies emphasized the role of community forestry and popular participation in forest management and rehabilitation. Despite the existing of this forest policy very limited efforts were made in Gedarif State to involve people in the management process.

**The study recommended that:**

- The coordination at the national level is very essential to ensure consistency in the natural, economic and socio-economic environmental policies and laws through regular communication between FNC and the other related sectors, and to increase exchange of information and consultation. The appropriate coordination will facilitate linkages horizontally with other sectors and vertically, between the different levels. This coordination is preferred to be from high-level political body.

- Formulation and development of any policy is a scientific deal that is based on accurate data.

- The natural resources departments must be grouped in the same sector to ensure joint action to sustain and conserve natural resources. Therefore the study recommended that the Higher Council must be involved in the developing of the policies and laws of natural resources departments.

- Sustainable forest management can only be achieved if community members themselves participate in policies and laws formulation and exert peer group pressure to prevent abuse of resources. With proper extension and provision of people's basic needs of forest products, the number of those who illegally enter the forests would decrease. Such control of entry to the forest will result in management improvement and better development of the forest.

- Extensive efforts are needed for the statehood to facilitate forest laws implementations.
- Extension should be given more emphasis as a tool to enhance people participation.
- Endorsement of proposed 2005 Forest Policy is urgently needed.
- The FNS should establish a monitoring unit for international conventions to ensure the execution their recommendations.

The study recommended that the different gears of the process of the policy formation and implementations including the policy formation process, awareness and sensitization of decision, coordination among different stakeholders and robustness of the information to be collected need all to be harmonized within authorized umbrella set-up that is responsible manage and master the process.

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## Appendix (1)

### ecneiCS fo ytisrevinU naduS ygonlhceT dna

#### كلية الدراسات العليا

استبانة لجمع معلومات عن فعالية دور المجتمعات المحلية في حماية الغابات الطبيعية بولاية القضارف

#### الخصائص الاجتماعية الاقتصادية

العمر: اقل من 20  20-40  40-60  60 فما فوق

المستوي التعليمي: خلوة  ابي  اساس  ثانوي  جامعي   
فوق الجامعي

مصدر الدخل الرئيسي للأسرة (المهنة الرئيسية): الزراعة  الرعي  التجارة  موظف   
اعمال حرة  اخري حددها.....

#### • مشاركة السكان المحليين في حماية الغابة بالمنطقة :

هل لديك مصالح في الغابة: نعم  لا   
اذا كانت الاجابة بنعم وضح

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

هل تري ان للمرأة نشاط او دور ذات صلة بالغابات: نعم  لا

اذا كانت الجابة بنعم ماهي النشاطات التي تقوم بها

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

هل شاركت في أى نشاط يتعلق بحماية الغابات ؟ نعم  لا

أذا كانت الأجابة بنعم وضح نوع المشاركة

1/ مكافحة الحرايق /2 منع القطع /3 تبليغ عن التعدي  
4/ حراسة الغابة /5 اخري

هل للأدارة الأهلية دور فى حماية الغابات؟ نعم  لا

إذا كانت الأجابة بنعم وضع ذلك

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

### المشاكل والمعوقات التى تؤدى

#### لى تدهور الغابات

هل هناك تراعات ذات صلة باستخدام الغابة نعم  لا

أذا كانت الأجابة بنعم ماهي

1/ زراعة 2/ رعي 3/ احتطاب 4/ اخري

هل هناك نقصان فى الغطاء الشجري فى المنطقة؟ نعم  لا

أذا كانت الأجابة بنعم وضع الأسباب

1/ توسع زراعي 2/ استنثار زراعي  
3/ رعي جائر 5/ سوء اداري  
5/ جفاف وتصحر 6/ اخري

هل تلقيت أى عمل إرشادى تجاه تنمية وتطوير الغابات؟ نعم  لا

أذا كانت الأجابة نعم وضع

1/ ارشاد مباشر 2/ الاذاعة  
3/ التلفزيون 4/ اخري

ماهي مقترحاتك للمحافظة ولحماية الغابة؟

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

هل هناك ممارسات تتم داخل الغابة؟ زراعة  رعي  سرقة   
احتطاب  اخري

### القوانين والقوانين:

هل تعلم ان هنالك قوانين للغابات : نعم  لا

إذا كانت الاجابة بنعم هل انت علي علم بمحتويات القانون: نعم  لا

وضح.....

هل تعلم ان قانون الغابات فعال نعم  لا

اذا كانت الاجابة بنعم

وضح.....

هل لك معرفة بالعقوبات والمخالفات لقوانين الغابات: نعم  لا

هل شاركت في اي نشاط له علاقة بتطبيق القوانين؟: نعم  لا

اذا كانت الاجابة بنعم ماهي مساهماتك؟

## Appendix (2)

### جامعة السودان للعلوم والتكنولوجيا كلية الدراسات العليا

استبيان لجمع معلومات تتعلق بتشريعات وقوانين الغابات - ولاية القضارف

خاص بموظفين الغابات:

هل انت ملم بمحتويات القوانين: نعم  لا

هل تجد قوانين الغابات اهتمام ودعم من الولاية: نعم  لا

هل تري ان قانون الغابات متناغم تماما مع ادارة الغابات: نعم  لا   
وضح.....  
.....

هل تري ان مكونات القانون ذات رابط قوي باشارك المجتمعات المحلية في ادارة الغابات؟  
نعم  لا   
وضح.....  
.....

هل تري ان اللوائح المحلية متضاربة مع القوانين المركزية؟ نعم  لا   
هل تري ان القانون قادر ان يستوعب العلاقة بين الغابت الولائية والغابات الاتحادية:  
نعم  لا   
وضح.....  
.....

هل تري ان قوانين الغابات مصاغة بصورة متكاملة مع قوانين ادارات الموارد الطبيعية الاخرى؟ نعم  لا   
وضح.....  
.....

ماهي الصعوبات التي تواجه تنفيذ القوانين؟ نعم  لا   
وضح.....  
.....

هل تري ان هناك قصور في تطبيق القوانين؟: نعم  لا   
اذا كانت الاجابة بنعم وضح  
.....  
.....

هل السياسات والخطط الموضوعة لحماية وتطوير الغابة متناغمة تماما مع السياسات العالمية؟: نعم  لا

وضح.....

هل الادارات المحلية متعاونة مع ادارة الغابات في تطبيق القوانين؟ نعم  لا

وضح.....

ادارة الغابة:

هل للغابة خطة واضحة؟ نعم  لا   
هل تري ان هناك اشراك فعلي للقادة المحليين في ادارة الغابات؟ نعم  لا   
اذا كانت الاجابة بنعم كيف تتم المشاركة

### Appendix (3)

جامعة السودان للعلوم والتكنولوجيا

كلية الدراسات العليا

استبيان لجمع معلومات عن قوانين وتشريعات ولوائح الغابات بولاية القضارف  
خاص بالتشريعين

الاسم.....

المسؤولية الادارية.....

هل لكم علاقة بالتشريعات واللوائح الخاصة بحماية الغابات بالولاية؟:

نعم  لا

اذا كانت الاجابة بنعم

وضح؟

.....  
.....

لاي مدي تهتم الولاية بحماية الغابات؟

تهتم جيدا  تهتم وسط  لا تهتم

هل قوانين الغابات فعالة في الولاية؟: نعم  لا

هل تري ان هناك قصور في قوانين الغابات في الولاية؟: نعم  لا

اذا كانت الاجابة بنعم وضح.....  
.....

في رايك مكونات وتطبيقات وتشريعات القوانين والخطط الموضوعية بالولاية هي المسؤولة عن تدهور الغابات؟

نعم  لا

اذا كانت الاجابة بلا وضح اسباب التدهور

ماهي مقترحاتك لتطوير التشريعات في مجال الغابات؟

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

## Appendix (4)

جامعة السودان للعلوم والتكنولوجيا

كلية الدراسات العليا

استبيان لجمع معلومات عن سياسات وقوانين وتشريعات ولوائح الغابات  
خاص بإدارات الموارد الطبيعية

اسم الإدارة.....

الاسم.....

المسؤولية الإدارية.....

هل لدي ادارتكم صلة باتشطة الغابات: نعم  لا

وضح.....

.....

هل تري ان سياسات الغابات متناغمة مع سياسات ادارتكم؟:

نعم  لا

هل قوانين الغابات متناغمة مع قوانين ادارات الموارد الطبيعية الاخرى؟:

نعم  لا

.....

.....

هل قوانين ادارتكم تمكن من عمل تنسيقي مشترك مع الغابات: نعم  لا

وضح.....

.....

ما هو ايكم في تطوير التنسيق او الية التنسيق التي تستوعب ادارات الموارد الطبيعية في اعداد السياسات  
والتشريعات والقوانين؟

.....

.....

.....

## Appendix (5)

جامعة السودان للعلوم والتكنولوجيا  
كلية الدراسات العليا

استبيان لجمع معلومات عن سياسات وقوانين وتشريعات ولوائح الغابات - ولاية  
الخرطوم

خاص بمندوبي الاتفاقيات الدولية وذوي الصلة

اسم الإدارة.....

الاسم.....

المسؤولية الادارية.....

هل هناك خطط عمل مشتركة بين اداراتكم والهيئة القومية للغابات؟:  نعم  لا

وضح.....  
.....

هل تري ان سياسات وتشريعات الغابات متناغمة مع القوانين الدولية؟

نعم  لا

وضح.....  
.....

هل تري ان سياسات وتشريعات الغابات متناغمة مع محتويات الاتفاقية المعنية؟

نعم  لا

وضح.....  
.....



## Appendix (6)

### جامعة السودان للعلوم والتكنولوجيا كلية الدراسات العليا استبيان لجمع معلومات عن قوانين الغابات

#### خاص بالرئاسة:

هل تري ان قوانين الغابات متناغمة مع اللوائح المحلية؟  
هل تري ان قوانين الغابات متناغمة تماما مع قوانين ادارات الموارد الطبيعية الاخرى؟  
هل تري ان مكونات القانون ذات رابط قوي باشراك المجتمعات المحلية في ادارة الغابات؟

نعم  لا  نعم  لا  نعم  لا

هل تري ان اللوائح المحلية عادة متضاربة مع القوانين المركزية:نعم  لا   
هل تري ان القانون قادر ان يستوعب العلاقة بين الغابت الولائية والغابات الاتحادية:  
ماهي الصعوبات التي تواجه تنفيذ القوانين؟

نعم  لا

هل تري ان قوانين الغابات تصاغ بصورة متكاملة مع قوانين ادارات الموارد الطبيعية الاخرى:

نعم  لا

هل هناك قصور في تطبيق القوانين؟: نعم  لا   
اذا كانت الاجابة بنعم  
وضح.....

هل هناك خطة واضحة لتطوير التشريعات والقوانين؟  
اذا كانت الاجابة بنعم هل يتم تنفيذ الخطة بصورة واضحة؟  
هل هناك اشراك فعلي للقادة المحليين في وضع خطط الغابة  
وضح

نعم  لا  نعم  لا

من هم الذين يضعوا خطة الغابة؟

هل السياسات والخطط الموضوعه لحماية وتطوير الغابة متناغمة تماما مع السياسات العالمية؟: نعم  لا   
هل سياسات الغابات في السودان متناغمة مع الاتفاقيات الدولية؟: نعم  لا   
وضح.....

هل الإدارات المحلية متعاونة مع ادارة الغابات في تطبيق القوانين؟ :  نعم  لا  
ادارة الغابة:

هل الإدارات المحلية متعاونة مع الهيئة القومية للغابات؟ :  نعم  لا  
اذا كانت الاجابة بنعم

وضح.....  
.....  
.....

هل السكان المحليين لهم حق في المشاركة في وضع خطة الغابة؟ :  نعم  لا  
ماهو رأيك في خطة الغابة الموضوعه

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

## Appendix (7)

جامعة السودان للعلوم والتكنولوجيا

كلية الدراسات العليا

استبيان لجمع معلومات عن سياسات وقوانين وتشريعات ولوائح الغابات - ولاية الخرطوم

خاص بالمنظمات غير الحكومية

اسم المنظمة.....

مجال عمل المنظمة.....

هل ترى ان قوانين الغابات تتكامل مع قوانين الموارد الطبيعية الاخرى؟:

نعم  لا

هل انتم تشاركون في اعداد او صياغة سياسات الموارد الطبيعية بصورة عامة والغابات بصورة خاصة؟ نعم  لا

ما هو دور المنظمات في تفعيل قوانين وتشريعات الغابات والموارد الطبيعية الاخرى

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