

The Role of Forest Policy in Sustainable Forest Management: Case study of Elgedaref State (Central East of Sudan)

Tagreed Abdelrahman Babiker¹, Abdelaziz Karamallah Gaiballaha², Amani Abdelrahim Kobbail³

^{1,2,3}Sudan University of Science & Technology, College of Forestry & Range Science, Khartoum, Sudan

Abstract: *Recognizing the importance of forest resources and the need for appropriate measures to optimize their management and utilization in Sudan; this research was carried out to fulfill the objective of assessing the suitability and appropriateness of policies to sustainable forest management. Three areas were selected (Elrawashda, Darelzain and Sarf Saaid) all were located in Elgedaref State Central East of Sudan. Research methods applied were: a social survey where a questionnaire was designed to collect primary data for implementation of policies and their role in sustainable forest management. This method was followed by participants' observations, participatory rapid appraisal and review of the documentary sources. The questionnaire was administered to 150 households randomly selected from three areas with a sample size of 10% of the total population. Results showed that most of the forest policies have failed to address the fundamental challenges of forest management in the study area. The conversion of forests to farmlands, weak institutional and governance structures, and ineffective involvement of relevant stakeholders were not properly addressed. Lack of political will and commitment, weaknesses in the implementation and enforcement of laws and standard practices, and lack of transparency significantly encouraged unsustainable harvesting of forest resources and illegal logging. The study recommended forest community members should be actively engaged in co-managing forest resources under a regime of very clear responsibility for protecting them from excessive exploitation. Another important aspect for the development and sustainability of the forest resources is rational land use policies. It also recommended an effective placing of forest resources management in the core of Sudan development agenda.*

Keywords: forest policy, forest resources, sustainable forest management, sustainability assessment, Elgedaref State

1. Introduction

Forest resources are of great importance to millions of people, especially those whose livelihoods largely depend on them. These resources play a key role in protecting the environment and are of tremendous importance to the sustainable development of every country^[1]. Forest resources policies and institutions are critical to achieving sustainable forest management. In Sudan various past governments formulated policies for developing a national forest estate and a timber industry that guarantee a full range of sustainable benefits for the population^[2]. The department of forest in the Sudan was 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^[3].

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^[4]. The second forest policy was issued in 1986. In addition to the main objectives of reservation of the natural forests and protection of the environment, the stated policy includes establishment of community, private and institutional forest. This policy raised the goal of forest reserves to 20% of the country area. The latest law was enacted in 1989 to enforce the policy of 1986^[5]. 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^[3].

Both forest policies were formulated indoor by forestry professionals alone without consultation of other relevant actors. This has led to the lack of commitment among other stakeholders and lack of political wills that required for their enforcement^[6]. Also both policies lack the tools required for their implementation and necessary elements of monitoring and evaluation.

In spite of these policies and interventions, the destruction of the natural forests continues at an alarming rate of 2% per annum. The factors responsible for this state of affairs include the over-exploitation of timber species, improper forest management systems, poor farming practices, population pressure, the complex nature of Sudan's land tenure system, lack of community involvement, an unequal benefits-sharing system, weak institutions, inefficiency of the timber industry, flouting of laid down regulations and lack of political will and commitment^[7].

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 favours the government and the industry on the one hand, but marginalizes the local communities on the other^[6]. The main objective of this study was to assess the suitability and appropriateness of policies to sustainable forest management. This paper analyses forest policies and management in Sudan. The key forest policies, the current state of the forests, the participation of local people in the management of forest resource and extension are critically analyzed.

2. Methods of Data Collection

The study was conducted in the Elgedarif State which is one of east-central states of Sudan. 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 seaport (Port Sudan, 834 kms) by the national capital high way road. ELgedarif State has an area of approximately 71,000sq.km. The state has rainy season extending for about four months from May to October. The prevailing wind during the wet season is from south west and from north direction in the dry season. Agriculture was; and still is the main economic activity, followed by live stock raising in the traditional seasonal transhumant pattern^[8].

The data were collected from both primary and secondary sources. Data from secondary sources were obtained through the review of literature including text books, journals, reports and previous studies. Primary data were obtained through structured personal face to face interviews. A questionnaire was designed to collect primary data for implementation of policies and their role in forest conservation. The questionnaire was administered to 150 households randomly selected from three villages near to three forests namely; Elrawashda, Darelzain and Sarf Saaid. The questionnaires was designed to obtain information on personal characteristics of the respondents, participation of local community in the forest protections and conservations, reasons of forest deforestation and degradation, the role of forestry extensions in the study area. A brief review of national forest policies was conducted. Additionally a semi-structured questionnaire survey was completed by interviewing 30 experts and professionals to analyze the strengths and weaknesses of the present policy. The collected data were processed and analyzed using the Statistical Package for Social Sciences (SPSS) software version 16. In this research, calculation of the percentages was used as a tool of analysis for interpreting the qualitative information collected from the respondents.

3. Results and Discussion

Sudan forests: the resource

Forest and woodlands (excluding the protected areas) cover over 25 percent of the total area of the country. The reserved forests constitute 3.6 percent of the total country area, while the reserved forests under sustainable management represents only 0.2 percent of the total natural forests^[6]. Sudan's forests annually provide 16 million m³ of firewood, industrial and sawn timber.

Forestry is very important in satisfying basic needs of societies at all stages of development. Forest products in the form of wood fuel, charcoal, construction poles, timber, gums, leaves, native and processed medicines are still in demand at varying levels. The means by which these products are obtained has varying impacts on the role played by forestry in environmental protection as well as community support. Historical data indicates declining trend in the forest area. The natural wood cover decreased from 40 percent to 19.3 percent^[9, 10, 11]. This was mainly attributed to expansion of agriculture, grazing, building and fuel wood consumption. The total demand for forest products was

estimated at 16.0 million cubic meters^[12] while on the supply side the annual increment in forest stock is estimated at 11.0 million cubic meters^[13]. This clearly indicates the annual loss in the biomass stock. Reference^[14] estimated that about 455,000 ha of forestlands are being cleared annually for agriculture and other purposes. Forests in Sudan are subdivided according to their origin in to three categories:

- (1) Natural forest area subset of forests composed of tree species known to be indigenous to the area. A bout 8.86 million hectares are at present reserved and become state owned. Larger areas of natural forests come under unregistered forestlands.
- (2) Plantation forests refer to: Forest established artificially by a forestation on lands, which previously did not carry forest within living memory.

Local communities' participation in forest conservations

The result of this study indicated that 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 (table 1).

Table 1: Local communities' participation in forest conservations

Responses	Frequency	Percent
Not Participated	124	83
Participated	26	17
Total	150	100

Those who are participated in forest conservation their contribution vary from fire control to prohibited illegal felling and ended with police notification (table 2).

Table 2: ways of participation of local community in forest protections

Ways of protection	Frequency	Percent
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
Total	26	100

In the group discussion local leaders declared that the role of popular committees in forest conservation was week. This is mainly due to the weak relationship with Forest 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 care for local people essential needs or plan for providing them in a rational way they added. In addition, local people and leaders considered the existing management are implemented in isolation from people's needs, concerns and problems. Reference^[15] added that despite the strengths at a local level and promising programmes currently underway, there remains an overall negative picture with regard to 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 a mindset 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. Reference ^[16] 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. 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 ^[17]. Reference ^[18] indicated that, the initial inquiries show the local peoples interest and willingness in conservation and management of the natural forest, 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 study suggests that to introduce new approaches to manage natural forests through the involvements of local peoples in order to sustain forest resources.

Conflicts with forest resources

The study revealed 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. The majority of the respondent 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 fuelwood and only 4% who mentioned fuel or grazing only (table 3)

Table 3: Reasons of the forest conflicts

Conflicts reasons	Frequency	Percent
Agriculture fuelwood and grazing	42	39
Agriculture and grazing	25	23
Agriculture	19	14
Agriculture and Fuel woods	14	13
Agriculture	4	4
Fuelwood	4	4

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 being with their animals in to 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 forestry official 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 and 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 stake holders, poor coordination, corruption and land use conflicts. All these reasons can have significant negative effects on management sustainability.

Forest deforestation and degradation

Results of this research revealed that the majority 92% of the respondents agreed to existence of forest deforestation and deterioration. The main reasons for deforestation were mentioned in table (4).

Table 4: Reasons of forest reforestation and deterioration

Reasons for reforestation and deterioration	Frequency	Percent
Agricultural expansion and Agricultural investment	45	30
Over gracing, 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
Total	150	100

It is clear that the major cause of forest deforestation and degradation in the study area is agricultural expansion and agricultural investment. Reference ^[19] 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 Reference ^[20, 21, 22, 23, 8] 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 farm; 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 [24]. 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. Reference [20] reported that the commercial charcoal production also contributed to the wide- spread deforestation in Elgedarif State. Reference [22] 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 lost to agriculture and forestry. The forest administration was also undergoing some changes from the department of jingles at the very beginning forest administration, to the present Forest National Corporation (FNC). So these changes may affect the decisions, plans and performance of forestry section. 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. Reference [25] 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. . Reference [26] [27] stated that misdirected government policies, lack of public awareness, weakness of legislation, economic activities are among main causes of degradation of vegetation. Reference [3] 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.

Reference [6] stated 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 [6]. It is now seen as multipurpose management of the forest, which means that its overall capacity to provide goods and services is not diminished [6].

Extension services

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. The Forest National Corporation and its branches in the country are responsible for forestry extension, but with little success. This is due to the lack of facilities and training in forestry extension. It was noted in this study that forest extension agent rarely visit villagers. Table (5) shows that; 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 received extension and they explained the way of receiving extension through meeting, television, and radio.

Table 5: Extension services

Extension received		Way of extension							
Yes		No		Meeting		Radio & meeting		Television	
F	%	F	%	F	%	F	%	F	%
51	34	99	66	42	82	5	10	4	8

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 of the staff rarely show 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 reference [6] 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.

Reference [6] 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. Reference [1] added 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 concentrated on management of reserved and protected natural forests and it should be carried out to highlight the people sustainable measures to reduce land degradation. Extension should be given more emphasis as a tool to enhance people participation

Analysis of Forest Policy 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. Reference^[3] 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. Reference^[3] 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^[3].

The previous analysis indicates that the result of both policies 1932 and 1986) were following: Deterioration of forest cover from 34% to 18.1%; 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; Area of forest plantations accomplished up to 1983 was less than half a percent of the total forest area. 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. Both policies lack the tools required for their implementation and necessary elements of monitoring and evaluation^[3].

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, is expected to make major changes in forest development and management. It is incorporating poverty reduction strategy, improvement of people standards, amelioration of physical environment and combating desertification.

Generally, the Forest Policy in Sudan was lacking a comprehensive policy and legislative framework that deals with land use in an integrated way^[20, 28]. Rather, there are a number of individual sectoral policies e.g. agriculture, forestry, wildlife and other resources. Government laid the policies alone and was very responsible for their implementation did not show enough commitment to see them executed. 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. Reference^[6] stated that forest policies in the Sudan laid emphasis on describing 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^[6].

A 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^[7]. 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 right^[6].

4. Conclusions and Recommendations

Improper land use and transformation of forest land by mechanized farmers and illegal felling for fire wood and charcoal are key drivers for the increasing incidence of deforestation. Depletion of forest resources and lands has continued, illustrating the failure of policies to attain the stated objectives. The major reasons for policy failures

include Lack of political will and commitment, weaknesses in the implementation and enforcement of laws and standard practices, and lack of transparency significantly encouraged unsustainable harvesting of forest resources and illegal logging. Forest community members should be actively engaged in co-managing forest resources under a regime of very clear responsibility for protecting them from excessive exploitation. Adaption of community-based forest resources management in Sudan will go a long way to improve the conservation and management of these resources in the country. Also an effective placing of forest resources management in the core of Sudan development agenda is needed. Sustainable management of forest resources can be achieved if the following measures are effectively implemented:

- Adequate access provided local residents to forest resources.
- Active local participation in designing conservation and resource management plans.

Another important aspect for the development and sustainability of the forest resources is rational land use policies. A national forest policy should be a part of a national land use policy, assuring balanced forest use and conservation with agriculture and other land uses. To minimize conflicts and to link social and economic development with environmental protection, long term national land use plan is required

References

- [1] Kobbail A. A. 2010. Collaborative Management for Sustainable Development of Natural Forests in Sudan: Case Study of Elrawashda and Elain Natural Forests Reserves. *International Journal of Social Forestry*, 3(2):101-133.
- [2] Kobbail A. A. 2011. Natural Forest Reserves Management From Local Perspectives: A Challenge for Developing a Participatory Forest Management Model. *International Journal of Social Forestry*, 4(1):32-62
- [3] Elmahi, A.G., & Abdel Magid. T. D. (2002). The Role of the private Sector, Civil Society and NGOs in the formulation and implementation of National Forest Policies and National Forest Programs in Sudan, Khartoum, Prepared as a Contribution of the Sudan Forest National Corporation to the Regional workshop held by FAO/RNE in Khartoum 26-27 January 2002.
- [4] Elwakeel. S. A., & Ali. E. M. (2003). Assessment of National Capacity Building Needs Related to managing Access to Genetic Resources and Benefit Sharing, Ministry of Environment and physical Development Higher Council for Environment and Natural Resources (HCENR), Assessment of Capacity Building Needs and Country Specific priorities in Biodiversity Management and Conservation in Sudan SUD/02/G3.
- [5] Kobbail A.A., Elfeel A.A. 2012. Local Communities Involvement in Forest Policy Implementation: Case from Sudan. *Asian Journal of Agricultural Sciences*, (4) 2: 140- 144. Maxwell Scientific Organization, 2012.
- [6] Kobbail A.A.2005. Towards A Participatory Management of Natural Forest Reserves in Sudan: A case Study of ELRawashda and ELain Natural Forests. Ph.D thesis, Faculty of Forestry, University of Khartoum, Sudan, 2005.
- [7] Elsiddig, E. A. (2004), Community based natural resources management the IGAD region. IUCN, Nairobi.
- [8] Elmadina, A. M. (2006). Community Forestry Strategies in the Sudan, Ph.D. Thesis. Sudan University of Science and Technology, Sudan
- [9] Harrison and Jackson (1958). Ecological Classification of Vegetation. The Sudan Agricultural Publications Committee, Khartoum, Sudan.
- [10] FAO (1995). Forest Products Consumption Survey in the Sudan. Forestry Development Project. FAO/GCP/SUD/047/NET. Khartoum-Sudan
- [11] FNC (1998a). Forest National Corporation, Dept. of Forest Management, Annual Report 1998.
- [12] FNC (1994). Forestry Products Demand Study. Department of Forest Management. Annual report. Khartoum-Sudan.
- [13] FNC (1998b). The National Forests Inventory. The Forest National Corporation. Khartoum-Sudan.
- [14] Elsidig, E. A.; Eltyeb, A. M. and Abdel gadir, A. Y. (1999). Sustainable Management of Natural Forests in Jebel Marra: With Consideration of Community Needs. SECS-JMFC
- [15] Klocke, (1996). Evaluation Report, FNC/GTZ Forestry Project, Jabel Marra Forest Circle project.
- [16] Kobbail, A. A., Suleiman M. S and Elmadina A. M. 2012. Formal Forest Management System in the Sudan and the Sustainability Issue. *Asian Journal of Agricultural Sciences* 4(1): 53-57, 2012 Maxwell Scientific Organization, 2012
- [17] Abdel Magid and T.D.Mohammed . A.G. (2013). Final Report on Assistance to the Revision of National Forest Policy, Legislation and Institutional Reorganization, FAO 2006, Report to FNC and FAO, 2013.
- [18] Ibrahim, G.A. (2002). The Involvement of Local People in the Management of the Natural forest Reserves (Rawashda forest - Gedarif State), M. Sc thesis, Sudan university.
- [18] Klocke, (1996). Evaluation Report, FNC/GTZ Forestry Project, Jabel Marra Forest Circle project.
- [19] Abdalla, N. A (2012). Participation of Rural Women in Forestry Extension Activites (Eastern Galabat Locality – Gedaref State – Sudan, M. Sc thesis, Sudan university.
- [20] Elmoula, M. E.(1985). On the problem of resource management in the Sudan. Environmental monograph series no. 4, Institute of Environmental Studies, University of Khartoum, Sudan, 131 p.
- [21] Eltyeb, G. E. & Lewandowski A. M. (1983). Environmental monitoring: Environmental degradation in Gedaref District. A paper presented at the workshop
- [22] Abdalla, E. H. (1987). Charcoal and firewood production in the Sudan. Field Document 22. Forests National Corporation, Khartoum. 52p.
- [23] Glover, E. K. (2005). Tropical dry land rehabilitation: case study on participatory forest management in Elgedarif, Sudan. Dr.Sc thesis, Helsinki University, Finland. University of Helsinki.
- [24] Fangama, I. M. (2006), The Impact of Refugees on forest-Tree Cover At UM Rakuba Um Gargur & ElTinedba Camps (Gedarif State) , Sudan University of Science and Technology.

- [25]FAO (2006). Sudan National Forest Policy Statement, TCP/SUD/2903(A) [http://WWW Fao. Org/ forestry/ 15151](http://WWW.Fao.Org/forestry/15151).
- [26]Eisa, A. (1996). Development for environmental perspective. Sudan Environment conservation society. Sudan.
- [27]Elasha, B. M. (2002). Tools to Support the Decision Making Process for Sustainable Forestry Planning and Management, case study: Riverain forests along the Blue Nile, thesis (p.H.D.), Faculty of Forestry, University of Khartoum, Sudan.
- [28]Tolentino, B. (1991). Promoting forestry as a land use under the Philippines Social Forestry Programme. In Trees and forests in rural land use. Mathoo, M.; Chipeta, M., (ed.). Forestry Department, Food and Agriculture Organization of the United Nations, Rome, Italy.