



The Role of Community Forests in providing goods and services for local communities

(Case study of El-Rawashda Forest – Gedaref State, Sudan)

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ABSTRACT

This study was carried out in El-Rawashda Natural Reserved Forest in 2019. It is located in the Eastern part of Sudan at latitude 14.2° N and longitude 35.6° E. The aim of this study is to highlight the role of community forest in raising the standard living of local people, while the specific objectives are to identify the direct benefits, indirect benefits and the awareness of local people about forest resources. Based on reconnaissance survey, the target population consisted of villagers, Farmers, herders and nomads around the El-Rawashda Forest. Due to the large gauge of the research population, stratified random sampling with 5% sample size and 95% level of confidence using snow ball techniques and theoretical saturation point theory, questionnaires were administrated and distributed to (100) household. In addition, local community leaders and forest officers were also interviewed to get detailed information concerning goods and services provided by forest and the drivers behind it. Statistical Package for Social Science (SPSS) was used to analyzed data obtained by questionnaires, The results revealed that there were remarkable goods and services drives by community forestry such as firewood, charcoal, fodder and forage, building materials and traditional medicine. In addition, the forest played a considerable role by providing a wide range of benefits, contributing significantly to people's livelihoods and environmental services.

Introduction:

Throughout the world, more than 2 billion people, depend on forests resources for their livelihoods, and to meet their primary energy demands (Hussain *et al.*, 2019). In the rural areas of developing countries people greatly dependence on forests and associated resources to meet their daily needs. Forests play a vital role for rural communities economic and environmental

services, it is there provide super benefits at different levels. These benefits include the importance of forests for water catchment protection, and mitigate soil erosion and improvement the micro climate, medicinal benefits, employment, carbon fixation and biodiversity (FAO, 2007).

IUCN (2015) identified that forests regulate ecosystems and play main part in the carbon cycle and supply goods and services beside them its other role in livelihoods income of 1.6 billion people depend on forests worldwide by submitting goods and services. Furthermore, the forests are considered as home of almost 80% of the world's terrestrial biodiversity.

World's forests report 2018 confirmed that 284 million people in Africa found in or around tropical forest and savannah areas and classified as forests population, 50% of them living under poverty line and they depend entirely on forests.

Community forestry is a broad term used to describe models of forest management that give local people the majority say in making decisions. Similar terms include participatory forest management, collaborative forest management, social forestry, and community-based forest management. With an aim to reduce poverty, community forestry is participatory and should serve all community members equitably (Ielystad, 2011). The community forestry defined as any situation which intimately involves local people in forestry activities (Elmadina, 2006). UNEP identified seven type of forests in Sudan that include desert and semi-desert trees and shrubs, riverine forests, low rainfall woodland savannah, high rainfall woodland savannah, mountain and gallery forest, tropical forest and plantations (FAO, 2017). Local communities in Sudan are known to protect and manage trees growing in community lands and house compounds (Elmadina, 2006).

The variability of forest trees and shrubs play a vital role inside the existence of rural communities in many areas in Sudan. Forest is the major sources of wood and non-wood products, contribute to soil conservation, repositories of aesthetic, ethical, cultural and religious values. Forest provides forage for animals, also is measured as big unit offering nutrition and game to many people, its play a vital role in ecology, such as fertilization, seed predation, spreading and germination, and predation on potential tormenter species.

Forests provide quite 10% of the gross domestic product in many of the poorest countries and supply with food and other products. Also it's contributing 78% of the national energy balance (FAO, 2007). All the same such a relevant role in world economy, progress towards proper forest management remains restricted, and there is continued loss and degradation of forests in many developing countries.

Mismanagement, malpractices and over exploitation of forest resources resulted in depletion and deterioration, and this study aimed to highlight the role of community forest products in providing stander of life of local people, and to investigate stockholder practices and rides inside the forest also determine the benefits from the community forestry to local people in the study area in addition determine the awareness of people around the community forestry.

Materials and methods:

Study Area:

This study has been conducted in El-Rawashda Natural Reserved Forest in 2019. It located in Eastern part of Sudan at Gedaref State, geographically lies about 45 km Eastern Gedaref at latitudes 14.2° N and longitudes 35.6° E. El-Rawashda Natural Reserved Forest is one of the reserved forests, administratively is part of El-Fashagah Forest Circle. Legally the forest was reserved and gazetted in 1960 as a Central Forest Reserves under 1932 Control Forest Ordinance

to safeguard the charcoal supplies for Khartoum. It covers an area of about 25290 hectares (Babiker, 2003).

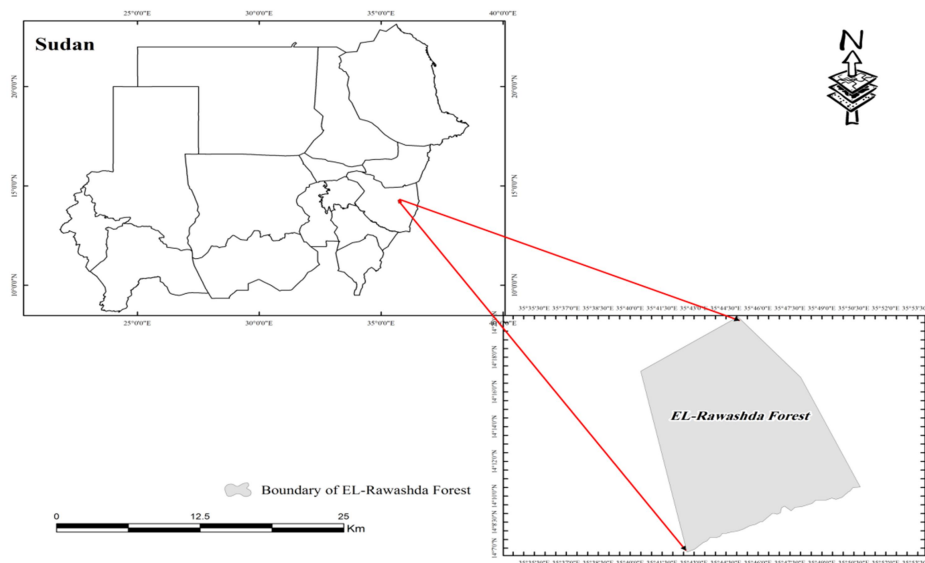


Figure (1) study area map

Source: Designed by the researcher, 2019

Population:

The total population of Gedaref State according to 2008 census was estimated to be 1,348,378 person, most of them are settled in local areas and their major activities includes agriculture, fishing and forest-related activities. While the employees, mining, industry, transport, trade and services are the main activities of urban population (Ministry of Information, 2012).

Climate:

UNEP (2007) reported that the dominant characteristic of Sudan's climate is a geographical variation in rainfall and temperature in different part of the country. El-Rawashda Natural Reserved Forest located in semi-arid zone; the rainy season starts in August and continues up to mid of October, the rainfall pattern ranging from 400 to 800mm with an annual average of 600 mm. However, the year is divided into two distinct seasons dry warm Winter (October - March) and hot dry Summer from April to June with average temperature equal to 29°C (Musa, 2017).

Land Use:

Gedaref State considered one of important State for food security in Sudan's strategic center, and it is considering the largest projects for rain-fed mechanized agriculture (Idris, 2017). FAO (1989) stated that agriculture was and still the dominant economic activity in Gedaref State followed by livestock rising, gum and forests products collecting and trading charcoal. The types of crops grown in Gedaref State are sorghum and sesame as main crops in the State. Other crops like millet, cotton, peanut and sunflower were also cultivated (Hassan and Arbab, 2008).

Types of community forests:

According to Elmadina (2006), there were deferent types of community forests in El-Rawashda area included homestead tree planting, Agroforestry, School planting and Gum garden.

Stakeholders:

In El-Rawashda area there are deferent stakeholders includes FNC, Farmers, Nomads, Contracted Farmers, Popular Committee, Gum Collectors, Fuel wood Merchants and Guards. And the stakeholders Rights, Needs, Involvement and responsibilities were played a vital role in community forests sustainability and effectiveness (Elmadina, 2006).

Methodology:

The research methodology included the descriptive and social surveys methods. The secondary data was collected from various sources which include published papers, text books, internet, official government documents and reports of forest related agencies, while the primary data based on questionnaire, observation and group discussion. The target population of this study consisted of villagers, farmers, herders and nomads around El-Rawashda natural Forest. Due to the large number of research population snow ball techniques, theoretical saturation point theory and stratified random sampling with 5% sample size were be used, the questionnaires were designed, administrated and distributed to (100) households. The questionnaire aim to collect data, information concerning the role of community forests from Local community leaders and forest officers were also interviewed to get detailed information concerning forest usage and the benefit behind it. Socio-economic data analyzed using Statistical Package for Social Sciences (SPSS) version 24 and the results presented, compared and discussed.

Results and discussion:**Age group of respondents around El-Rawashda Natural Reserved Forest:**

According to the results in table (1), the majority of the respondents (61) were of age above 35 years (61%). The respondents whom age ranged in this category are knowledgeable, more experiences and settled in the area for longtime. Therefore, they can explain significantly with their opinions and views about the drives behind forest cover change. Jain and Sajjad (2016) stated that, young rural communities mostly less dependence on forest products due to their readiness to discover income opportunities in the cities compared to their elders who can easily find a job outside the forest. On the other hand, because of the less mobility, the older adults of the household have reduced the chance of gathering forest products.

Table (1) The Respondents Age Group in the study area:

Categories	Frequency	Percentage%
18 – 25	14	14
26 – 35	25	25
36 – 50	31	31
50 and above	30	30
Total	100	100
Sign		*

NS = Not Significant ($p > 0.5$). * = significant ($p < 0.01$). ** = high significant ($p < 0.001$).
*** = highly significant ($p < 0.0001$).

The Education level of respondents around El-Rawashda Natural Reserved Forest:

The finding in Table (2) indicated that, (35%) of the of the respondents have primary school education followed by the secondary school 25% and illiterate 21%. This result consistent with the study of Hassan and Arbab (2008) stated that the majority of the population had a basic education. This indicated that, people with less an advanced level of education are depending to some extent on forest resources because forest enhances employment opportunities in rural communities.

Table (2) the respondent's education level in the study area:

Categories	Frequency	Percentage %
Illiterate	21	21
Khalwah	7	7
primary education	35	35
Secondary education	25	25
University	12	12
Total	100	100
Sign		***

Main occupations of respondents around El-Rawashda Natural Reserved Forest:

According to the results in table (3) more than 49% of respondents practiced farming as the main activity around and inside the forest throw (Taungia system) and outside forest in the rain-fed scheme, and other respondents have another source of generating income such as trade and herding. Gathering and processing forest products may be a main source of income, or provide a supplementary income for people primarily involved in activities outside the forest, such as farming. The money earned in this way may be spent on food, or invested in agricultural assets such as livestock or seeds to secure future food supplies. Agriculture is the most dominant land use activity in Gedaref State, which is considered the largest scheme of rain-fed mechanized farming in Sudan.

Table (3) the main occupations of respondents in the study area:

Categories	Frequency	Percentage %
Farmer	49	49
Herder	7	7
Trader	1	1
Employer	2	2
Labour	21	21
House keeper	20	20
Total	100	100
Sign		****

Direct benefits gain from El-Rawashda Forest:

According to the results in figure (2) the majority of people (93%) who lives in villages around the forest are mainly dependent on firewood, it has the most significant goods comes from forest and the primary source of energy mainly for cooking, and heating by the local community, flowed by collecting resins 67% and forest fruits 63%. Also there are some other direct benefits gained from the forest like charcoal, building materials, source of traditional medicine, fodder and forage for animals, environmental services and hunting. In addition to 88% of respondent

reported that, there is indirect benefits gain from forest represented in its environmental role on purify air from dust and improve the microclimate.

This result in line with what was documented by previous studies carryout by several authors (Katz, 1984, Abu Sin *et al.*, 1986, Abdelgadir, 1987, Furfey, 1988 and FAO, 1987) whom stated, community forestry constituted a fundamental and main source of multiple socioeconomic and environmental values to rural people, such as Belding materials, fuel wood, fodder and income. Hence, the needs of people house livelihood depend on forest products must be incorporated into sustainable management (Elhassan, 2000).

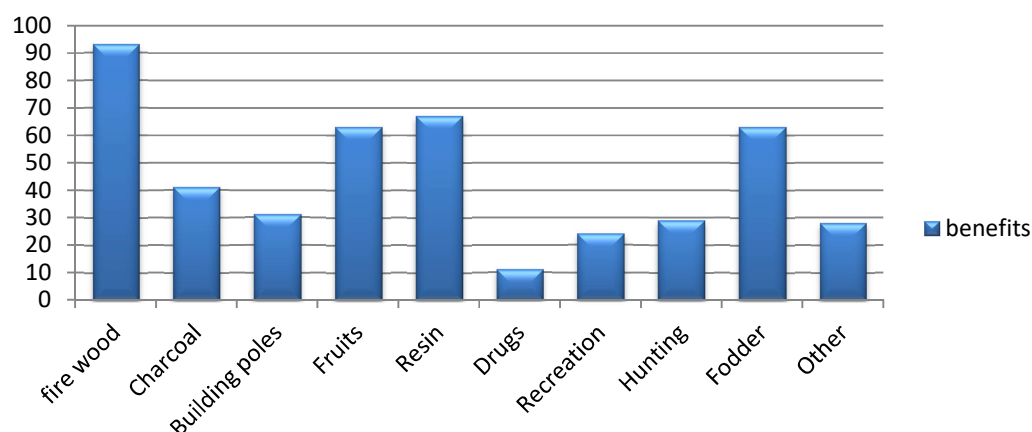


Figure (2) The Benefits gained from forest: Plant Species inside El-Rawashda forest:

The result of field observation indicated that, the dominant trees and shrubs in the forest are *Acacia seyal*, *Acacia mellifera*, *Acacia senegal*, *Acacia oerfota*, *Balanites aegyptiaca* and *Ziziphus spina chresti*. According to FNC officer there are few of *Combretum ssp.*, *Prosopis spp.* and *Dichrostachys cineraria*. The types of grasses and herbs inside El-Rawashda forest are *Cassia obtusifolia*, *Xanthium prazilucum*, *pennisetum sp*, *Osmium sp.*, *Arstida sp.*, *ymbopogon nervatus*. From local community observation in table (4) with highly significance (85%) and according to FNC recorded all types of plant species are present in forest now compared with the previous years and there was a difference in dominant species whereas *Acacia mellifera* shrubs and *Acacia oerfota* are the dominant species compared to the previous years, which was dominated by trees of *Acacia seyal*, *Acacia senegal* and *Balanites aegyptiaca* and they have explained that difference to over-cutting and selective clearance of tree species .

Table (4) plants that existed in the past and has no disappeared:

Categories	Frequency	Percentage%
Existed	85	85
Disappeared	15	15
Total	100	100
Sign.		***

Agriculture Practice inside the forest:

Figure (3) showed that, the majority of respondents (99%) revealed that there is agricultural practice inside El-Rawashda forest under Toungia system to rehabilitate the forest besides the cultivated crops. Usually, the crops that growing are Sorghum sp, Sesamum sp. and Panicum sp. This system over away of resulting the cost of forest plantation, they rehabilitation the forest besides the cultivating of crops and vegetables led by the rural people. This result consisting with study of Elmadina, (2006) who mansion, practicing of agriculture inside a forest will lead to increase diversity and productivity of food, wood and non-wood forest products.



Plate (1 and 2) agricultural practice inside El-Rawashda Forest

Grazing or browsing inside the forest:

According the result in Figure (4), most of the respondents (97%) mentioned that, there is grazing activities practiced inside El-Rawashda forest and the types of animals are camels, sheep's, goats and cows. According to respondent answers pastoralist in past grazed inside the forest at most months of year except the rainy season. But right now the pastoralist and their animals were practicing grazing inside the forest intensively during June, July and November and outside these period animals are grazing in Butana area or in agricultural schemes. According to (Fikir *et al.*, 2016), livestock units possessed by the household's is more interconnected with forest resources and the livestock production responsible for creating ecological issues to forest resources. Forest as a source of fodder in scarcity period: It's clear from the Figure (5 and 6) 88% of the respondents agreed on the role of El-Rawashda forest as providing fodder especially during scarcity period, and this result is consistent with FAO (2017), which noted that forest trees contribute around 30% of animal feed per annum and over 70% in dry seasons.



Plate (3, 4 and 5) grazing activates inside El-Rawashda forest

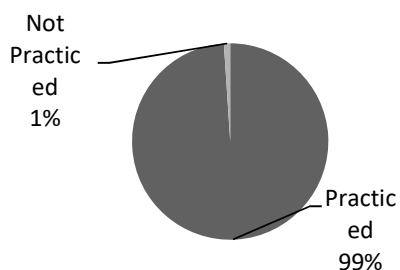


Figure (3) Agricultural practices inside forest

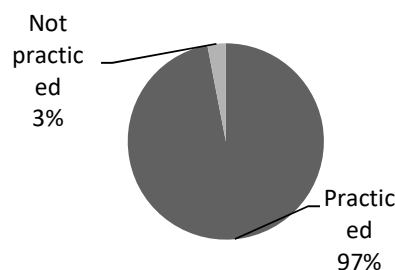


Figure (4) Grazing and browsing inside forest

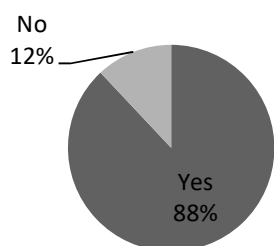


Figure (5) Forest as a source of fodder in scarcity period

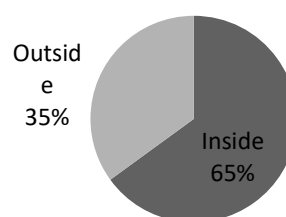


Figure (6) Prevalence of grazing inside or outside the forest

The results from Figure (4) showed 65% of the respondents prefer the grazing inside forest for plenty of shade and free of cost.

Role of FNC in awareness rising:

The Results on table (5) showed the lack of awareness raising programs provided by FNC in the villages surrounded the forest and at that area where the 66% of respondents stated there are no extension programs provided by forest extension to local community around the forest. This will lead to over used.

Existence of strong extension service is a key constituent for the success of community forestry program. However, from plan traditional role of extension services, the tube of extension advocated for should be more of a facilitating nature.

It is main job will be to provide a blat form for stack holder to negotiate aspect of sustainable management of the resources. Beside, development news of extension massages, material and methods should match prissily with specific characteristic of the clientele (Elmadina, 2006).

Table (5) Role of FNC in rising awareness of people in the study area:

Categories	Frequency	Percentage%
Active	34	34.0
Not active	66	66.0
Total	100	100.0
Sign.		**

Legislations prevent cutting and organize entering into the forest

The finding in Figure (7) showed that, (77%) of respondents mentioned that legislations and forest laws organize the entering and benefits could be gained out of El-Rawashda forest.

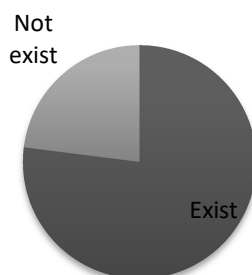


Figure (7) Legislations prevent cutting and organize enter to forest in the study area

Conclusion and recommendation :

The Majority of people living around El-Rawashda Reserved Forest (93%) are mainly dependent on goods and services provided by forest such as firewood, charcoal, fodder and forage, building materials and traditional medicine. El-Rawashda Natural Reserved Forest played a considerable role by providing a wide range of benefits, contributing significantly to people livelihoods and environmental services. Essential role of forest in rural communities is providing essential products. Also the rural households generate cash income and meet their subsistence needs by using forest products. For that reason the basic needs of the local community around the forest should be taken into consideration by FNC, beside activating protection and increasing the facilities of guarding and monitoring of forests.

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