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Assessment the Environmental Awareness of Pastoral Community in ALGutaina Area, White Nile State, Sudan

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Abstract

The study was carried out at ALGutaina area, White Nile State in Sudan. The study aimed to assess environment awareness of the local community towards natural rangeland. The study used mainly questionnaire to obtain information. Three villages were chosen to represent the local community, and the sample size was 10%. The information was analyzed by using SPSS statistical analysis software. The study found that there was a high rate of illiteracy among respondent, about (48%). It was also found that the grazing pattern followed was semi-sedentary grazing with a percent of (79.2%). The study concluded that there was a clear deterioration in rangeland resources and the absence of environmental awareness in the pastoral community. The study recommended care to education and raising environmental awareness.

Keywords: *Environmental awareness, semi-sedentary, rangeland*

1. Introduction:

Sudan's area is about 1,886,000 km^2 and its population is 40, 97 million populations' census (2008). Livestock population is 106 million (MARFR, 2015). Rangelands make up an estimated 47% of the earth's terrestrial surface (Roselle *et al*., 2011). The rangelands of Sudan contribute to the income and subsistence of a large sector of the population and in addition provide more than 80% of the total feed requirements of the national herd (HCENR, 2003). Rangeland in Sudan form a huge natural resources, they constitute various types of grazing land, which vary from open grassland to seasonal watercourses, flood plains, river banks and associated island, woodland, hills and mountain slopes (Zaroug, 2000). Rangeland biomes encompassing much of the area where pastoral livestock production is a major land use, cover about 51% of the earth's land area but support 78% of the global grazing area (Asner *et al* ., 2004). Moreover, it has increasingly become a threat to the pastoral production systems and has contributed towards increases in poverty and tribal conflicts over grazing land and water resources (Abule *et al*; 2005 and Solomon *et al*; 2007). Bearing in mind the connection of environmental problems with human behavior, environmental awareness is considered the most important focal point that helps in addressing these problems and contributes to finding a solution to them through the voluntary involvement of community members in preserving the environment and the natural resources it contains. According to Hammadi (2015) the environmental awareness plays a vital role in conserving the environment.

2. Materials and Methods:

2.1 The Study Area:

This study was conducted at ALGutaina locality in White Nile state. It lies between latitudes 13°:30¯N - 15°:13¯N and longitudes 32° 15¯E – 34 E. It was war dry winter and hot rainy season, with temperatures lies between 22 to 36˚ C. The annual rainfall of AlGutaina area, range between 105- 204, (Abdallah, 2008).

2.2 Methods:

2.2.1 Secondary Data:

Secondary data was collected from the documents of institutions related to the study. These documents included scientific papers and reports.

2.2.2 Primary Data:

It was done in 2019; the primary objectives were to give a general background of current situation of rangeland, type of livestock, pattern of rearing, vegetation status, and threat to rangeland, precipitation rate, knowledge of environmental pollution and knowledge of rangeland deterioration. The questionnaires were designed to obtain primary data information from the study area. The sample size was chosen according to the population, it was 10%. The community in the study area was homogenous, 130 of the respondents were selected randomly from three villages (Umm Alaqah, Umm Disis, Al-Qahfa). The descriptive statistics method was used as a main tool for analyzing the information to achieve the objective in the study area.

2.3 Data Analysis:

The data were analyzed by using statistical package for Social Science (SPSS) computer program. The results were represented in the form of frequency tables and figure.

3. Results and Discussion:

3.1 Social characteristics of pastoralists and rangeland situation

Sex type:

The results in table (1) show there was a highly significant difference at $p<0.0001$ among the respondents according to their sex types that (59.2%) were male and (40.8%) were female. This result may be attributed to occupation of herding is practiced by male, while female left in their home look after small animals to provide milk for local consumption, prepare food look and after children.

Table (1): Sex in the study area

Sex type	Frequency	Percent
Male	77	59.2
Female	53	40.8
Total	130	100
Sign	***	

NS = insignificant (p>0.5). *= significant (<0.01). **= highly significant (p<0.001). *= very highly significant (p<0.0001).**

Age groups:

As seen in Table (2) there was a high significant difference at p<0.0001 among the respondents according to their age. About (36%.9) of respondent were (25- 45) years indicating that animals are mostly looked after by youth. This indicates that the percentage of youth people can be involve them in all activities related to the conserve and protect rangeland from deterioration. In addition, may be movement far from their villages to search forage and water.

Table (2): Age of respondents in the study area

Age (year)	Frequency	Percent
18-25	42	32.3
25-45	48	36.9
45-65	28	21.5
65-75	12	9.2
Total	130	100
Sign	***	

NS = insignificant (p>0.5). *= significant (<0.01). **= highly significant (p<0.001). *= very highly significant (p<0.0001).**

Education:

There was the high significant difference between the respondents according to the education levels at p < 0.0001. As illustrated in Table (3) illiteracy rates recorded the highest percentage in the respondent, reaching about (48.5%). This result reflects the spread of illiteracy in the area and the community's lack of interest in education. Illiteracy has a negative impact on the environmental awareness of the pastoral communities. In contrast, the presence of education leads to an increase in awareness. Soto-Cruz *et al* (2014) found that the increasing of education leads to increased awareness.

Table (3): Distribution of pastoralists according to level of education

Education level	Frequency	Percent
Illiterate	63	48.5
Kahlwa	48	36.9
Secondary	18	13.8
University	1	0.8
Total	130	100
Sign	***	

NS = insignificant (p>0.5). *= significant (<0.01). **= highly significant (p<0.001). *= very highly significant (p<0.0001).**

3.2 Type of livestock:

Livestock provide food and income to the majority of the 1.2 billion people living on less than $1 per day (FAO, 2008), and livestock demand is rising to unprecedented levels (De Haan *et al*., 2001; FAO, 2008). There was the high significant difference between the respondents according to type of livestock rearing in the study area at $p < 0.0001$. Figure (1) shows that the majority of the respondents raise Goats (62.3%), Sheep (22.3%), Cattle (10%), Camels (3.1%) and (2.3%) different type of the animals. This indicates that goats the most adapted animal to the environment compared to other animals. The most damaging trends for livestock production will occur in rangeland regions that are already the most vulnerability and socio- economics (Godde *et al*, 2022).

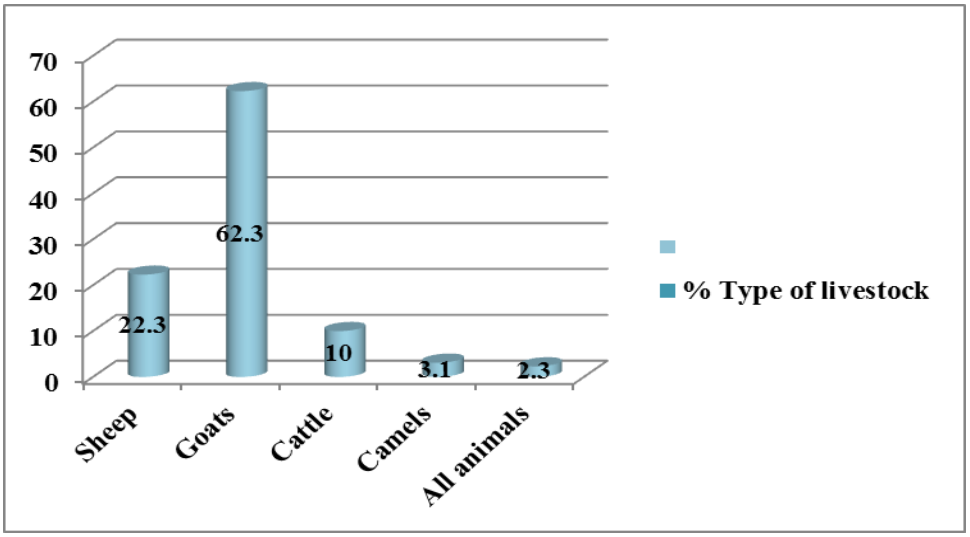

Figure (1): Distribution of respondent according to type of livestock rearing

3.3 Pattern of rearing:

Demand has raised on the rangeland resources resulting in degradation and depletion of vegetation (Ahmed *et al*., 2006). There was the high significant difference between the respondents according to grazing patterns practiced by the community at $p < 0.0001$. According to Table (4) about (79%) of respondents are semi-sedentary. This result confirms that semi-sedentary it is a common pattern in in the study area, where local communities raise animals around villages and practice rain-fed agriculture, while (12.3%) are sedentary and (8.5%) said that they move with the herds. This may be due to search for forage and water in the study area. According to (Sanou and Zida, 2018) current grazing practiced have negative impacts on the vegetation surrounding the study area.

Table (4): Distribution of respondent according to pattern of rearing

Pattern of rearing	**Frequency**	**Percent**
Nomadic	11	8.5
Sedentary	16	12.3
Semi-sedentary	103	79.2
Total	130	100
Sign	***	

NS = insignificant (p>0.5). *= significant (<0.01). **= highly significant (p<0.001). *= very highly significant (p<0.0001).**

3.4 Current situation of rangeland:

There was the high significant difference between the respondents according to current situation of rangeland at $p < 0.0001$. Results in Table (5) show that (50.0%) and (45.4%) of pastoralists mentioned that the current situation of rangeland as it is and poor respectively. These result indicates that the rangeland in ALGutaina area of clear environmental degradation. According to (Azimi *et al*., 2013) the rangelands it suffering from heavy grazing and periodic droughts, rangeland still makes an important contribution to the country's economy as well as playing an important role in environmental protection and food security.

Table (5): Rangeland situation

The current situation of rangeland	**Frequency**	**Percent**
Excellent	1	0.8
Good	5	3.8
As it is	65	50.0
Degraded	59	45.4
Total	130	100
Sign	***	

NS = insignificant (p>0.5). *= significant (<0.01). **= highly significant (p<0.001). *= very highly significant (p<0.0001).**

3.5 Vegetation status:

There was the high significant difference between the respondents according to vegetation status at $p < 0.0001$. The majority of the respondents (70%) in Figure (2) mentioned that vegetation status in the area was a little, while (27.7%) of them indicated that the vegetation cover was as it is and (2.3%) of the respondents stated that the vegetation cover is abundant. This could be the rangeland deterioration in the study area. The dominant plant species in the area *Ipomoea blepharosepla* (Alhintut), *Aristida adscensianis* (Alqawu), *Cyprus totandus* (Alsaedah), *Censhru spp* (Alhaskanit), *Panicum turgidum* (Ailtamam), Leptadenia pyrotennica (Almarakhu), *Tribulus terristeris* (Aldrisuh), *Dactyloctenium aegyptium* (Abwasabie), *Ocimum pasilicum* (Alrayhan), *Indigofera spp* (Alsharaya) and *Eragosctis reptans* (Amqandil). In addition, plant species have decreased in the area like *Amaranuthus vidis* (Lisan altayr), *Gynandropsis gynandra* (Altamlikuh), *Cyprus rotandus* (Alsaedah), *Dactyloctenium aegyptium* (Abwasabie), *Ipomoea blepharosepla* (Alhintut), *Panicum turgidum* (Ailtamam), *Euphrobia dendrides* (Umm Labineh), *Cymompogon nervatus* (Almahrib) and *Echinochola colona* (Aldafrah). Also, plant species have invaded the area such as *Striga spp* (Albuda), *Prosopis cgilensis* (Almiskit), *Indigofera spp* (Alsharaya), *Fagoina cuetica* (Am shuaykah) and *Senna alexandrina* (Alsinamki). according to (HCENR, 2003) the degradation is attributed to expansion of mechanized and traditional rainfed cultivation, seasonal fires which remove 15-30% of the populations concentrated around perennial sources of water and wet season grazing areas and current drought. In addition, overall vegetation change and decline, there is also a decline of some key species. Soils and climate define the natural vegetation and the agricultural potential of the various zones (Cadi, 2001 and Smadhi, 2001).

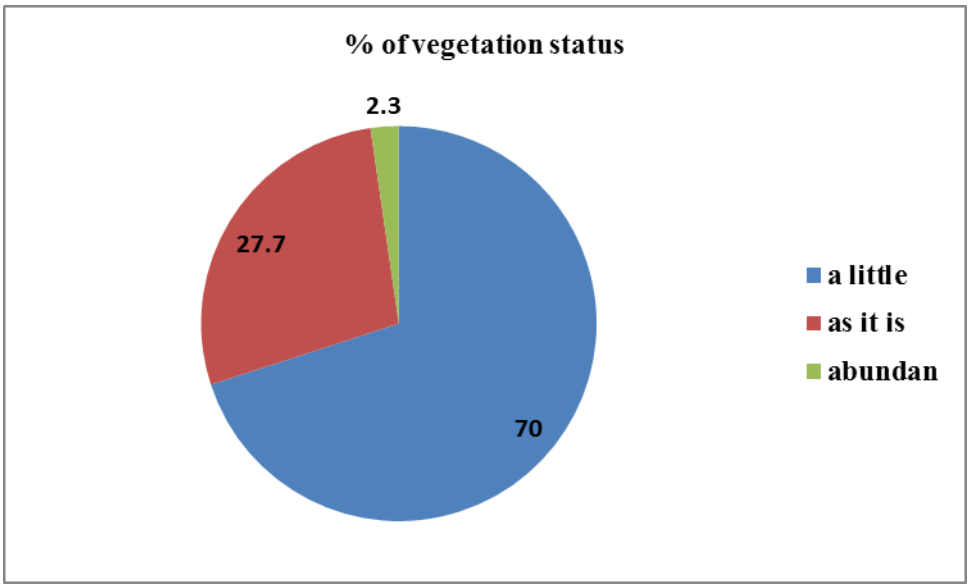

Figure (2): Vegetation status in ALGutana area

3.6 Threat to rangeland (fire):

There was the high significant difference between the respondents according to threat rangeland at $p < 0.0001$. The result in Table (6) shows that (33.1%) of pastoralists confirmed the existence of seasonal fires. This may be attributed to lack of vegetation cover. Also, reflects the extent of the deterioration of natural. According to (Bradstock *et al*., 2002) fire has direct and indirect effects on soils, vegetation and animals.

Table (6): Threat to rangeland (fire)

Fire	**Frequency**	**Percent**
Found	43	33.1
Not found	87	66.9
Total	130	100
Sign	***	

NS = insignificant (p>0.5). *= significant (<0.01). **= highly significant (p<0.001). *= very highly significant (p<0.0001).**

3.7 Precipitation rate:

There was the high significant difference between the respondents according to precipitation rate at $p < 0.0001$. The results in table (7) show that the (63.8%) of the respondent said low precipitation rate in the study area, while (36.2%) of them believe that rainfall is appropriate. This may be attributed to the location of the study area in the dry zone made it vulnerable to fluctuating and irregular rainfall and the occurrence of frequent droughts, which helped to the environmental degradation of the rangeland. The phenomenon of climate change may a clear impact on rangeland. According to (Kagoné, 2000) the climatic limiting factor for plant growth is rainfall which is generally tending to diminish, with increasing variation between years.

Table (7): Precipitation rate in the study area

Precipitation rate	Frequency	Percent
Low	83	63.8
Appropriate	47	36.2
Total	130	100
Sign	***	

NS = insignificant (p>0.5). *= significant (<0.01). **= highly significant (p<0.001). *= very highly significant (p<0.0001).**

3.8 Knowledge of environmental pollution:

There was the high significant difference between the respondents according to knowledge of environmental pollution at $p < 0.0001$. The results in Table (8) indicated that (74.6%) of respondent confirmed that they have no knowledge of environmental pollution, its causes and how it occurs. This result reflects a lack of environmental awareness and knowledge of the negative effects practiced by the community on rangeland.

Table (8): Environmental pollution in study area

Knowledge of environmental pollution	Frequency	Percent
They have knowledge	33	25.4
They have no knowledge	97	74.6
Total	130	100
Sign	***	

NS = insignificant (p>0.5). *= significant (<0.01). **= highly significant (p<0.001). *= very highly significant (p<0.0001).**

3.9 Knowledge of rangeland deterioration:

According to Table (9) show that about (60%) of pastoralists they have no knowledge of rangeland deterioration. Pastoralists utilizing degraded rangelands generally suffer from poverty and food insecurity (Donald and Jay, 2012). Thus, rangeland degradation and desertification have raised concerns globally.

Table (9): Knowledge of rangeland deterioration of respondent in the study area

Knowledge of rangeland deterioration	Frequency	Percent
They have knowledge	51	39.2
They have no knowledge	79	60.8
Total	130	100
Sign	***	

NS = insignificant (p>0.5). *= significant (<0.01). **= highly significant (p<0.001). *= very highly significant (p<0.0001).**

4 Conclusions:

The study concluded that there was a clear degradation in rangeland resources and the absence of environmental awareness in the pastoral community. About (48.5%) of respondents are illiterate. Also, the majority of pastoralists (74.6%) they have no knowledge of environmental pollution. In addition, most of pastoralists (60.8%) they have no understanding of rangeland deterioration. The study recommended care to education and raising environmental awareness.

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