

## Research Article

### THE CURRENT STATUS OF PALATABLE AND ENDANGERED PLANT SPECIES IN KORDOFAN FROM USERS PERSPECTIVE

<sup>1</sup>Musa Ahmed Musa Tibin, <sup>2</sup>Amona Idris Abdalla Idris, <sup>3</sup>Asma Ibrahim Sabil Aldomaa, <sup>4</sup>Alsammani Ali Mohammed  
<sup>5</sup>Salah AbdulGabar Salah Bukhari and <sup>5\*</sup> Jumaa Barram Jadalla

<sup>1</sup>Department of Animal Production, Faculty of Natural Resources and Environmental Studies, University of Al Sallam Alfula, Sudan.

<sup>2</sup>Department of rural extension and Training, Faculty of Natural Resources and Environmental Studies, University of Kordofan, Sudan

<sup>3</sup>Department of Animal production, Faculty of Natural Resources and Environmental Studies, University of Kordofan, Sudan.

<sup>4</sup>Department of Forestry and range Sciences, Faculty of Natural Resources and Environmental Studies, University of Kordofan, Sudan.

<sup>5</sup>Department of Animal production, Faculty of Natural Resources and Environmental Studies, University of Kordofan, Sudan.

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#### ABSTRACT

This study was conducted in the three states of Kordofan, Sudan, with the objective of studying traditional knowledge about range plants and those of high nutritional value that are endangered. Preliminary data were collected from 300 respondents via structured questionnaire. The data were analyzed using SPSS Statistical Package for Social Sciences software. The results showed that the respondents in the age groups of 15-40 years were the majority (80%), most of them were pastoralists (55%), married (79.9%), and illiterate (52.0%). They were able to distinguish between palatable, unpalatable, undesirable and harmful plants species. The respondents also indicated the distinction between grazing plants that increase sheep production (weight gain, growth and milk production). The pastoral groups showed their dependence on rangelands as main source of feed for sheep and other animals, they also knew the plants that were more selected by animals and the effect of this selection on plants composition, and they noticed the decrease in the presence of some species that animals prefer more than others. Shepherds have special ways gained by practice and the experiences of those who grow up in the profession. The respondents explained that they could classify the palatable plants from the animals' choice of them according to the testimony of 62.7% of them, and the nutritional value of the palatable types of animal productivity according to the opinion of 68.1% of the respondents. Most of the respondents indicated that the palatable species decreased in the percentage of their presence in the rangeland. The study concluded that the users of the rangelands were fully aware of the preferred and useful range species, and that they were aware of declining to accept animals for their choice. The study recommended more research and devise ways to preserve these plants and prevent their extinction.

**Keywords:** Rangelands, utilization, indigenous Knowledge, pastoralists experience.

#### INTRODUCTION

Rangelands are the main source of feed for national herd in Sudan – nomads and agro pastoralists use the resource communally throughout the year. This long period of utilization has made herders well adapted to the patterns that suit every ecosystem they use. They are the best person to consult if plant species are to be studied. Range condition to be evaluated. They are also aware of toxic and harmful plant as well as most palatable species with good nutritive value. That is because of their long experience of use. They can compare range condition at present with the situation prevailed before years ago. For all these reasons, it was necessary to interview uses to get their traditional knowledge on range condition, forms of utilization dominant flora species at present and in the past, constraints to sustainable production system of animal production on range lands it was also of great significance to be consulted those range lands, users to understand how palatable species can be conserved.

#### The objectives of the study

The overall objective of the study was together information from the range land and to develop strategies that can help in conserving, develop and manage range lands. The direct objectives were:

1. Collection of data on users and their perception on range lands use.
2. To get information on range plant on the study area.
3. To compare between range species at present with situation before ten years.

#### MATERIAL AND METHODS

##### The study area

The study was conducted on three states, North, west and south Kordofan states. The questionnaire was executed at rainy season. From each of the three states, the respondents were selected among livestock producers; Abu haraz, Elobeid, Bara, Umruwaba, Alkhor Alabeyad and Abuelghor in North Kordofan; Dilling and Aldibaibat from South Kordofan and Gheibash, Ankosh, Alkhuwei and Morkab from West Kordofan.

##### Data collection

From each of the three states, member of respondents were selected among livestock producers; 100 from North Kordofan, 75 respondents were selected from West and South Kordofan plus additional fifty from the three states. The respondents were approached from their rainy season camping areas around Elobeid. Fifty respondents were added to make the whole sample size to three hundred respondents. The rainy season camping areas' respondents were originally from the three state. The whole sample was taken from males since men

\*Corresponding Author: Jumaa Barram Jadalla,

<sup>5</sup>Department of Animal production, Faculty of Natural Resources and Environmental Studies, University of Kordofan, Sudan.

assert responsibility over the family members. The individuals were assisted to answer the questions included in the questionnaire since the majorities were illiterate or were unable to comprehend what is requested from them.

**Statistical analysis**

The collected data was statistically analyzed by Statistical Package for Social Science (SPSS) computer program. The results are represented mainly in the form of descriptive tabular summaries.

**RESULTS**

**Personal characteristics of the respondents**

Age groups of respondents are presented on table (1). Age categories at 31-35 and 36-40 represented the highest age groups among respondents making together 44.1% of the total number of the sample (21.1 and 23%), respectively. Those who were younger age categories; less than 26 years were less than 17% while those older than 45 years were even less and represented 8.9%. The gender of the respondents showed that they were all males. Table (2) showed the marital status of the respondent. The data revealed that the majority (79.9%) of respondents were married, while 18.6% unmarried, 1% divorced and 0.5% widowed. Concerning the educational status of the groups were shown on table (3). It was obvious that over half of the respondents were reported being illiterate while those who attended the basic educational level reached to 36.8% and those had secondary education level were 5.4%.

**Table (1).** Personal characteristics of the respondents

parameters	Frequencies	%
<b>Age Groups of Respondents</b>		
15—20	19	9.3
25_21	15	7.4
30_26	40	19.6
35_31	43	21.1
40_36	47	23.00
41_45	24	11.8
50_46	13	6.4
More than 50	3	1.5
Total	204	100
<b>Marital status</b>		
Married	163	79.9
Single	38	18.6
Widow	1	0.5
Divorced	2	1.0
total	204	100
<b>Educational level</b>		
Illiterate	106	52.0
Basic	87	42.6
Secondary	11	5.4
Total	204	100

Table (4) revealed that the herder represented the largest occupation group (55.4%) followed by those reported being breeders (36.8%) with smaller portion reported being farmers (6.9%) while merchants representing 1%. Areas of the respondents, From 12 areas in North, South and West Kordofan states, 204 respondents were selected for data collection on range condition, utilization and state of the palatable range plants. Respondents from Dilling and Aldibaibat represented the highest percentage (15.2%) due to the fact that the area had larger population, high density of nomads and as transitional grazing area where cattle camel and sheep owners pass by during early rainy season from south to northward and from North to south at the end of the rainy season. El obeid , Gheibash and Alkhuwei had second largest percentage since those areas represent rainy season

camping areas with high density of herders during the rainy season (11.3, 11.8 and 10.8%) respectively. Other areas had smaller percentages ranging from as high as 9.3 % to 0.5%. Concerning the period spent in herding which was reported in table (4.5), nearly 75% reported being engaged in this activity in a period less than 15 years. Among the respondents 25% spent 11-15 years in the activity, 24.2% being in this business for 3-5 years and 23.5% showed adopting this business from 6-10 years. The rest reported being engaged in this activity as low as 0.98% (36-40 years) or as high as 9.8% (16-20 years).

**Table (2)** the Occupations adopted by the respondents

Occupation	Frequencies	%
Herder	156	55.4
Breeder	110	36.8
farmer	21	6.9
Merchant	3	1.0
Total	300	100

**Table (3).** Areas of the respondents (North, South and West Kordofan states

Area	Frequencies	%
Abuharaz	15	0.5
Elobeid	34	11.3
Bara	28	9.3
Umrwaba	19	6.4
Alkhor alabeiyad	10	3.4
Abuelghor	16	5.4
Dilling	46	15.2
Aldibaibat	46	15.2
Gheibash	35	11.8
Ankosh	21	6.9
Alkhuwei	32	10.8
Morkab	12	3.9
Total	304	100

The identification of the palatable species among the other plants and how the herder characterizes them are shown in table (6). It was reported that 62.7% of the respondent answered from animal acceptance, while 37.3 using their experience for identification. Table(8). Most respondents reported that palatable plants are always had high nutritive value (68.1%) while 22.1% thought palatable plants being moderately nutritive and only 9.8 % said that palatable plants were of low nutritive value. Through asking on where the places of palatable plants are found, the answers varied according the reports from the respondents. The majority (66.2%) reported that they could be found on range, while 25.5% reported that they might be everywhere, while 8.3% said that the palatable plants were usually of little % on rangeland on special sites.

**Table (4)** Duration of Periods Spent in Herding

Period	Frequencies	%
3-5	49	24.2
10_6	48	23.5
15_11	51	25
20_16	20	9.8
25_21	9	4.4
30_26	13	6.4
35_31	11	5.4
40_36	2	0.98
Total	204	100

**Table (5)** Percent of the palatable plant species (%)

Methods of Identification	Frequencies	%
From animal acceptance	128	62.7
From experienced of herders	76	37.3
Total	204	100

**Table(6).** Percent Palatability of Range Plant Species

Nutritive value	Frequencies	%
High	204	68.1
Low	67	22.1
Moderate	29	9.8
Total	300	100

Table (9) shows the abundance of palatable plant species on range lands, the data noted that the respondent reported 58.8 as low abundance while 40.2% reported that the palatable plants % was medium with small group of respondents (1%) reported that the palatable plants were rare. Over grazing is the most factor that affect the decreases in the palatable plant species (47.1) while 42.6% is due farming activities, but low percent of the reasons that affect the palatable species could due to low rainfall table (10). Table( 11)The identification of the nutritive value of the palatable is based either on the acceptance by the animal or its positive effect on production. 52.9 of the respondent answered that the animal selection is the main base to identify the nutritive value, while 47.1 reported the increase in animal production.

**Table (7).** The Places Where Palatable Plants are Found

Place	Frequencies	%
Everywhere	76	25.5
on range on special sites	199	66.2
Usually of little % on range	25	8.3
Total	300	100

**Table(8)** Abundance of palatable plant species

Abundance	Frequencies	%
High	3	1.0
Medium	121	40.2
Low	176	58.8
Total	300	100

**Table (9).** Reasons for Decreased Palatable Species

Reason	Frequencies	%
Heavy grazing	141	47.1
Low rainfall	31	10.3
Farming activities	128	42.6
Total	300	100

Table (13) Methods and Techniques that were recommended by respondents for reversing the situation and recovering the palatable species were many. Range lands production was seen by most respondents (52.45%) as the best method for recovering the lost palatable plant species. Others (23.04%) reported that reseeded would be the most effective method for getting the lost plants back. Proper stocking rates and grazing management were seen as good tools for recovering the palatable species (14.71 and 9.80%) respectively

**Table (10).** The situation of animal husbandry in the areas where the respondents were interviewed showed that animals had decreased

Method	Frequency	%
Reseeding	69	23.04
Proper stocking rates	45	14.71
Grazing management	29	9.80
Total Rangelands protection	157	52.45
	300	100

production, or the respondents were planning to abandoning animal production activities. Conflicts over rangelands were also reported becoming common. Shifting to farming was also an alternative that was reported by 12.7% of the respondents.

**Table (11).** Bases to classify plants as palatable

Bases for classification	Frequencies	%
Animal selection	159	52.9
positive effect of animal production	141	47.1
Total	300	100

**Table (12)** situation of animal husbandry on range lands in Kordofan states

Situation	Frequencies	%
Decreased production	207	69.1
Abandoning animal production activity	29	9.8
Conflicts over rangelands	25	8.3
Shifting to farming	39	12.7
Total	300	100

## DISCUSSION

### Personal characteristics of the respondents:

The interviewed (respondents) selected for data collection on range lands, range plants, condition and Trent in the study area have shown that age categories from 21-45 made almost 75% if the sample shown that there are the most active members of the community engaged in economic activities where animal has husbandry is the most popular, occupation and most profitable area for investment. This is conferment by the % herders (55.4%) and breeder (36.8%) table as shown in table (5,4). most respondents were either illiterate (52.1%) or attendant of basic school (42.65%). this is constant with situation that taking children to school is very rare and school dropouts are man. Most respondents have indicated that they practiced animal production activities for not less than five years. The majority were engaged for up to 25 years. This give credibility of their experience in observation reported on range plants and range condition. They have indicated how to classify range plants, distinguish between palatable and unpalatable species where of good nutritive value by animals' preference and performance. The results reported here are in line with those observations of Ghorbani *et al.*, (2013) who showed that the role of indigenous ecological knowledge in managing rangelands sustainably in has been crucial in the resources use in northern Iran. The respondents have shown that they could suggest ways and means to improve degraded range lands. That could be through protection as perceived by (52.45%), reseeded degraded areas, avoidance of over stocking (proper stocking) (14.71%), through general grazing managements as reported by (9.80%). The respondents were also able to identify problems created by deteriorating range lands they reported that could lead to decreased animal production in general or producer Wright abandon that occupation, if they continue they should certainly get into conflicts with farmers or other animal produces. The

herders could also shift to farming keeping only small stocks. Shoka *et al.*, (2010) conducted a comprehensive study on indigenous knowledge of the pastoral livestock producers and animal herders and have shown that producers are well experienced and at least could classify plants, identify palatable and unpalatable species, toxic and harmful plants for their stocks. In Tanzania Ismail (2020) found that stakeholders and rangelands users were well experienced in identification of plant species and their benefits to animals. They could also point to problems facing them in using range resources. That is why Dika (2016) considered indigenous knowledge in rangeland management in traditional production vital to start with when studying rangeland use and conservation. Nevertheless the author believed that the local communities knowledge was not satisfactory alone for sustainable rangelands management. Gufu (2012) from another hand believed that harnessing pastoralists' indigenous knowledge for rangelands management is essential. The study of Samia ,(2019) on indigenous knowledge of cattle breeders has shown that traditional livestock borders were well experienced in their field they have shown that all aspects of animal feeding on rangelands should be masked if sustainable production is attained. Similarly Munguntuul (2019) considered that local community experiences and their indigenous knowledge in Mongolia in rangeland management were essential for sustainable resource use.

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