MedCrave
Step into the World of Research

Biodiversity International Journal

Research Article

Open Access

CrossMark

The first floristic study in al Sabaloga area proposed biosphere conservation reserve in Sudan

Abstract

This study was conducted in the AL Sabaloga area. The main objective of this study was to identify the flora in the Al Sabaloga area. The objective of this study is to investigate of the Status of Range Plants Genetic in Al Sabaloga area. A total sample size of 131 was chosen randomly to collect primary data. The data were coded, summarized, tabulated and processed. Analysis was conducted using (SPSS) computer program. The results were presented in the form of a frequency distribution. The results of this are increase trees (96.2%). Shrubs (93.9%), herbs (86.3%), climber (72.5%), increase trees, herbs and climber (80.9%) and poor vegetation (45.8%).

Keywords: flora, poor vegetation, conservation reserve and sustainable development

Volume 4 Issue 2 - 2020

Salma Abdelghaffar Hassan Alamin,[1] Hala Ahamed Hassan[2]

[1]Biodiversity and NAT Research, Environmental and Natural Resources and Desertification Research Institute, Sudan

[2]Department of Range Science, Sudan University of Science and Technology, College of Forestry &Range Sciences, Sudan

Correspondence: Salma Abdelghaffar Hassan Alamin, Environmental and Natural Resources and Desertification Research Institute (ENRDRI), The National Center for Research, Sudan, Tel 00249912831589, Email elaminsalma7@gmail.com

Received: February 24, 2020 | **Published:** March 20, 2020

Introduction

Sudan is about 1,882,000 km^2. The human population is 42.2 million.[1] AL Sabaloga Reserve declared in 1946 with a total area of 116000 hectares. It lies on the western bank of River Nile, at the 6th cataract, about 150 km. From Khartoum, the Capital of Sudan. It is located in the semi-arid climatic zone at latitude N31- 17 and E 33- 16 and longitude. The topography is hilly with undulated valleys. The valleys covered with scattered Acacia's species in addition to dense seasonal grasses during the raining season. The rainy season begins in July this period normally lasts until the end of September. The dry season begins in December lasting until May.

Al Sabaloga was declared a Game Reserve in 1946, because it is inhabited by an endangered species; Barbary sheep (*Ammotragus lervia*). As a matter of fact the Al Sabaloka game reserve is proposed a Biosphere Reserve. The Biosphere Reserve concept, of the UNESCO MAB Programme, calls upon wise conservation and sustainable development of all natural resources and the integration of local communities' participation in conservation activities and management plans of the reserve. The conservation and protection activities for wild animals and their habitats in Al Sabaloga through the integration approach of the management of natural resources and involvement of local communities is strongly recommended. Therefore the assessment of the natural resources (specifically plant genetic resources) and their utilization by the local communities is among the goals towards the proper management. The main objective of this study was to identify the flora in the Al Sabaloga area.

Materials and methods

A survey was conducted in the Al Sabaloga area in 2017. A total sample size of 131 was chosen randomly to collect primary data.

Natural vegetation

Direct observations and primary surveying were used to assess environmental conditions and plant community type.

Sample collection

Plant specimens were collected from different sites of the study area at different times. The collection procedure followed the methods described. The whole plant was collected in the case of herbs and twigs with leaves and flowers and /or fruits in case of shrubs and trees.

Preparation of specimens

The specimens collected were stretched to dry between newspapers and firmly pressed inside a herbarium press. Newspapers were continuously changed during drying to avoid rottening of material. Specimens were identified and verified using keys in the taxonomic references, namely: Broun et al.,[2] Andrews[3–5] and Elamin.[6] The specimens were mounted, labeled and deposited at the herbarium of the Environmental and Natural Resources and Desertification Research Institute (ENRDRI), National Centre for Research (NCR), Khartoum. Field observations were recorded including, habit, habitat, distribution and colors of flowers during the collection trips. In the herbarium further classification analysis and /or identification were carried out initially by examining the various parts of the specimens collected using a hand-lens. Fine floral characters were examined under Mbc-10 dissection microscope. A preliminary species identification was carried out using a set of keys,[3–5] Hutchinson et al.,[7] and Braun et al.,[8] Specimens were matched with identified and authenticated herbarium specimens in the herbarium of ENRDRI and the Herbarium catalogue of the Royal Botanic Gardens, Kew (http: // apps. kew.org/herbcat/navigator.do) for confirmation. The synonyms of the identified species were extracted from many references.[6,7,9–12]

Updating of plant names was taken into account according to recent literature namely: http://www.theplantlist.org/ and Herbarium catalogue, Royal Botanic Gardens, Kew (http://apps.kew.org/herbcat/navigator.do). The list of clades and orders covered in this study was arranged according to the Linear Angiosperm Phylogeny Group (LAPG) III while subfamilies, genera and species are arranged alphabetically.

The vernacular names of species were recorded from local inhabitants within the study area and also extracted from Broun et al.,[2] Andrews,[14] for citation of species only the oldest reference cited was (Sp. Pl. in most cases), in addition to Andrews.[3–5]

Economic uses given were compiled from local people and available literature. The life-forms of plants were formulated according to Raunkiaer.[15]

Plant diversity measurements

Three study sites were selected to represent the structure and composition of plants within each area. The area occupied by natural vegetation was measured using a quadrate and the line transect methods. In order to characterize soil cover, water and landscape vegetation, 50m line transects and $1m^2$ quadrate (N = 3) were used. The quadrate was replicated three times (N= 9). Measurements and collections were carried out in two different seasons: the end of winter in March and in the end of the rainy season in October.

Plant samples were collected for species identification and for estimating the diversity of each sample site. Along each transect, percentage cover of bare ground, grass, and dry plants (litter) were measured in every quadrate.

Data analysis

The questionnaire was coded and then analyzed SPSS software. The Chi-square test was used for testing the significant differences between the respondents. Descriptive statistics were also used to present to present the data.

Results and discussion

Vegetation changes are attracting the attention of environmentalists and socio-economists. Such changes have been occurring rapidly, especially in developing countries, and their influence on environmental conditions may be as large as the effect of climatic change.[16] The distribution of the vegetation in the years 1972 -2000 differ from described by Harrison et al.[17] The difference may be due to the drought that prevailed in the area. Beside this factor the uses of plant resources by man as fodder (*Cyndon dactylon- Faidherbia albida*), fire wood (*Acacia tortilis –Acacia seyal*), medicine (*Senna alexandrina-Ricinus comunis*)…etc. Without management this may affect the plant diversity.

About (131) questioners were collected in especial target groups in the age from 45 to 65 ages. The result in Table 1 shows that about (72.5%) of the respondents in the surveyed sample were male while (27.5%) female. Figure 1 shows about (40%) of respondent are primary, secondary (32%), Kahlwa (18%) and illiterate (9%). According to Figure 2 shows the distribution of respondents according to occupation about (48.9%) farmer and herders (21.4%). According to Table 2 show (96.2%) of respondent said increase trees such as Acacia *seyal* var *seyal, Acacia nilotica* sub sp *nilotica, Memosa pigra* L, *Prosopis chilensis* Molina, *Parkinsonia aculeate* L, *Acacia tortilis* sub sp *raddiana, Faidherbia albida* Del, *Prosopis chilensis* Molina, *Balanites eagyptiaca* Del. Most of respondent (93.9%) said increase shrubs for instance *Sesbania sesban* L, *Sesbania Arabica, Ziziphus spina Christi* L, *Ricinus communis* L, *Salix muriellii* Sakan, *Calotropis procera* Ait, *Solanum unqniculatum* Rich, *Pilocespalus acacia* Zucc, *Capparis dicedua* , *Calotropis procera* Ait, *Solanum unqniculatum* Rich, *Salvadora persica*. Also about (86.3%) of respondent said increase herbs for example *Senna alexandrina, Senna italic, Cypreus rotundus, Cypreus bubosus, Boerhavia repens, Fagonia cretica* L, *Euphorbia egyptiaca, Cyndon dactylon, Cleome gynandra, Tribulus terrestris, Cypreus conglomerates* Rottb, *Laptadenia oblongfolia, Sida alba, Trianthema portlacastrum, Cucumis prophetaraum* L, *Corchorus oritalis, Abutlion pannosum, Cardiosremum corundum* L, *Helotripum saponium, Phragmites austarales, Desmostachya bipinnat* L, *Targus berteronianus, Aerva javanica, Panicum turgidum, Beliphrus persca Bum, Boerhavia repens, Cirtullus conocynthus L* and *Abutlion pannosum.* (Tables 3–5).

Table 1 Distribution of respondent according to

	Frequency	Percent
Male	95	72.5
Female	36	27.5
Total	131	100

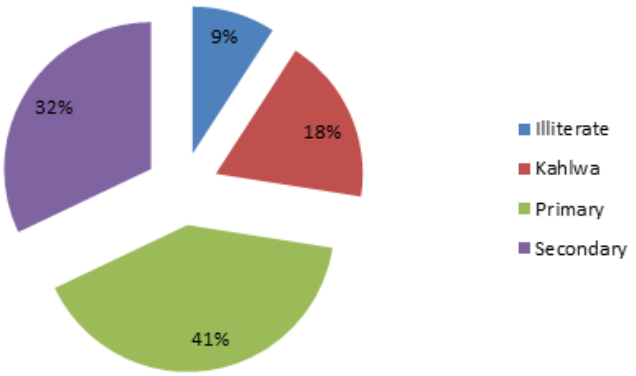

Figure 1 Distribution of respondents according to level of education.

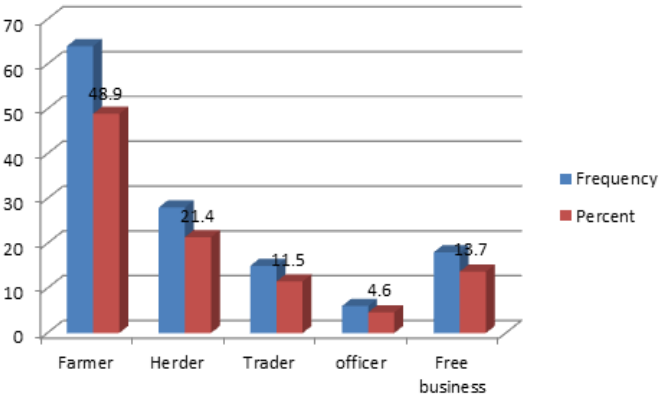

Figure 2 Distribution of respondents according to occupation.

Conclusion

The range floristic in this region represented in trees, shrubs and herbs. It could conserve and protect from deterioration by several reasons like climate change and human activities.

Citation: Alamin SAH, Hassan HA. The first floristic study in al Sabaloga area proposed biosphere conservation reserve in Sudan. *Biodiversity Int J.* 2020;4(2):103–107. DOI: 10.15406/bij.2020.04.00169

Table 2 Plant composition in the study area

		Frequency	Percent	Chi- Square	DF	Sig
Increase trees	Agree	126	96.2	232.962	2	.000
	Neutral	4	3.1			
	Disagree	1	.8			
Increase shrubs	Agree	123	93.9	100.954	1	.000
	Neutral	8	6.1			
	Disagree	0	0			
Increase herbs	Agree	113	86.3	166.275	2	.000
	Neutral	14	10.7			
	Disagree	4	3.1			
Increase climber	Agree	95	72.5	94.229	2	.001
	Neutral	27	20.6			
	Disagree	9	6.9			
Increase trees herbs and climber	Agree	106	80.9	135.405	2	.000
	Neutral	19	14.5			
	Disagree	6	4.6			
Poor vegetation	Agree	60	45.8	9.725	1	.008
	Neutral	32	24.4			
	Disagree	39	29.8			

Table 3 Tree species in the study area

Species	Family	Local name
Acacia seyal var seyal	Memosaceae	Talih ahmer
Acacia nilotica sub sp nilotica	Memosaceae	Sunt
Memosa pigra L	Memosaceae	Elst elmostahya
Prosopis chilensis Molina	Memosaceae	Meskat
Parkinsonia aculeate L	Caesalpinaceae	Sesaban
Acacia tortilis sub sp raddiana	Memosaceae	Seyal
Faidherbia albida Del	Memosaceae	Haraz
Prosopis chilensis Molina	Memosaceae	Meskat
Balanites eagyptiaca Del	Balanitaceae	Hegleg

Citation: Alamin SAH, Hassan HA. The first floristic study in al Sabaloga area proposed biosphere conservation reserve in Sudan. *Biodiversity Int J.* 2020;4(2):103–107. DOI: 10.15406/bij.2020.04.00169

Table 4 Shrub species in the study area

Species	Family	Local name
Sesbania sesban L	Fabaceae	Soreeb
Sesbania arabica	Fabaceae	Soreeb
Ziziphus spina Christi L	Rhaminaceae	Sider
Ricinus communis L	Euphorbiaceae	Khroua
Salix muriellii Sakan	Salicaceae	Safsaf
Calotropis procera Ait	Ascalepidaceae	Ausher
Solanum unqniculatum Rich	Solanaceae	Gubeen
Pilocespalus acacia Zucc	Loranthaceae	Irg elhakem
Capparis dicedua	Cappariaceae	Tondub
Calotropis procera Ait	Ascalepidaceae	Ausher
Solanum unqniculatum Rich	Solanaceae	Gubeen
Pilocespalus acacia Zucc	Loranthaceae	Irg elhakem
Salvadora persica	Salvadoraceae	Arak

Table 5 Herb species in the study area

Species	Family	Local name
Senna alexandrina	Caesalpinaceae	Sanamaka
Senna italica	Caesalpinaceae	Sana elkalb
Cypreus rotundus	Cyperaceae	Seada
Boerhavia repens	Nyctaginaceae	Safl
Fagonia cretica L	Zygophyllaceae	Amshweka
Euphorbia egyptiaca	Euphorbiaceae	Um lebana
Cyndon dactylon	Poaceae	Nageela
Tribulus terrestris	Zygophyllaceae	Derasa
Laptadenia oblongfolia	Ascalepiadaceae	Alga
Sida alba	Malvaceae	Umshadeeda
Trianthema portlacastrum	Portulaceae	Rabaa
Cucumis prophetaraum L	Cucurbitaceae	Fagos
Corchorus oritalis	Tiliaceae	Malokhya
Abutlion pannosum	Malvaceae	Grgadan
Cardiosremum corundum L	Convlvulaceae	Karmkrm
Helotripum saponium	Boraginaceae	Danb elagrb

Citation: Alamin SAH, Hassan HA. The first floristic study in al Sabaloga area proposed biosphere conservation reserve in Sudan. *Biodiversity Int J.* 2020;4(2):103–107. DOI: 10.15406/bij.2020.04.00169

Table continue

Species	Family	Local name
Phragmites austarales	Poaceae	Bos
Desmostachya bipinnat L	Poaceae	Halfa
Targus berteronianus	Asteraceae	Rabol
Aerva javanica	Amaranthaceae	Ras elshayb
Panicum turgidum	Poaceae	Tomam
Beliphrus persca Bum	Acanthaceae	Begel
Boerhavia repens	Nyctaginaceae	Safl
Cirtullus conocynthus L	Cucurbitaceae	Hanthel
Cenchrus biflorus	Poaceae	Haskanet
Salvadora persica	Salvadoraceae	Arak

Acknowledgments

None.

Conflicts of interest

The author declares there are no conflicts of interest.

References

1. WPR. World Population Review. Country Populations. 2017.
2. Braun AF, Massey RE. Flora of the Sudan. Thomas Marby and Co., London. 1929.
3. Andrews FW. *The Flowering plants of the Sudan* (Vol. 3). T. Buncle and Co. Ltd. Arbroath. 1956.
4. Andrews FW. *The Flowering plants of the Anglo-Egyptian, Sudan* (Vol.2) T. Buncle and Co. Ltd. Arbroath. Scotland. 1952.
5. Andrews FW. *The Flowering plants of the Anglo-Egyptian, Sudan* (Vol.1) T. Buncle and Co. Ltd. Arbroath. 1950.
6. El Amin HM. *Trees and shrubs of the Sudan*. Ithaca press. Exeter. London. 1990.
7. Hutchimson J, Dalziel JM. *Flora of West Tropical Africa 2nd edn*. Crown Agents for Overseas Governments and Administrations London. 1963.
8. Braun MH, Burgstaller AM, Hamdoun, et al. Common weeds of Central Sudan. GTZ. Eschborn. 1991.
9. Index Kewensis. An Enumeration of Genera and Species of Flowering Plants. Oxford Univ Press. 1965.
10. Wickens GE. The Flora of Jebel Marra and its Geogrpahical Affinites. *Royal Botanic Garden. Kew Bulletin Additional Series*. 1976.
11. Sahni KC. Important trees of the Northern Sudan, Khartoum University press. Khartoum. 1968.
12. El Ghazali GEG. The flora of the Eastern Nuba Mountains with special reference to Medicinal plants. 1985.
13. Elspeth Haston, James E Richardson, Peter F Stevens, et al. Linear Angiosperm Phylogeny Group (LAPG) III. *Botanical Journal of the Linnean Society.* 2009;161(2):128–131.
14. Andrews FW. *Vernacular names of plants as described in flowering plants of Anglo-Egyptian Sudan*. (Vol. 1) M.C. Coroudale and Co., (Sudan) Ltd. 1948.
15. Raunkiær. The life-forms of plants and their bearings on geography.1934;2–104.
16. Turner BL, Sanderson S, Fischer G, et al. Land use and land cover changes. 1925.
17. Harrison MN, Jackson JK. *Ecological classification of Vegetation of the Sudan.* 1958.