

Dedication

This work is dedicated to my father's soul **Talha Ahmed**, my Mother **Amna Abdallah**, my wife **Amna**, Brothers **Ahmed, Basheer, and Othman**, and my sisters, **Aaisha, Batool, Halyma and Marria**.

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Abstract

This study was carried out at Sinnar state, during the period 2012-2014. The aim of the study was to investigate the most important ecological factors that influence *Acacia senegal* and *Acacia seyal* growth and to assess the Socio-economic aspects which have direct impact on the ecology of both species at the study area. Also to study the most important uses of both *Acacia senegal* and *Acacia seyal* beside to find the best ways to address *Acacia senegal* and *Acacia seyal* planting to restore soil fertility of exhausted land. Tozi reserved forest was selected as a case study for this research. Soil samples under both natural species (*Acacia senegal* and *Acacia seyal*) and from bare land vicinity for control were collected from depth (0-30cm) at 1.5 meter distance from trees . Samples were transported to the laboratory for analysis and obtained, N.P.K results were obtained . Also samples were taken from the leaves of both species at the study area, where they were analyzed and their constituent nutrients(N.P.K) identified. Also the socio-economic considerations of the communities living in close proximity to the forest were incorporated in the study. A questionnaire was designed for 79 people who represent a number of random samples of a number of villages bordering the forest. Data were analyzed by the Statistical Package for the Social Sciences, SPSS. The study revealed that nitrogen was higher under *Acacia senegal* and *Acacia seyal* and lower in bare land while phosphorus was more under *Acacia senegal* and Potassium was the same in all sites. Generally, the result showed that soil taken under both species is better compared to bare land. Also the study revealed the leaves of both *Acacia senegal* and *Acacia seyal* were rich of NPK.

The study revealed that the area was prosperous of these tree species. Also it revealed that it is possible to decrease deterioration at the study area through planting of suitable tree species to increase soil fertility.

المستخلص

اجريت هذه الدراسة بولاية سنار في الفترة ما بين 2012- 2014 استهدفت الدراسة البحث في معرفة العوامل البيئية الهامة المؤثرة في نمو شجرتي الهشاب والطلح كما تطرقت الدراسة الي دراسة اجتماعية اقتصادية للمجتمعات حول المنطقة كذلك تمت دراسة اهم استخدامات شجرتي الهشاب والطلح بجانب ايجاد اهم الوسائل المعالجة لزراعة هذه الانواع لاعادة خصوبة التربة المنهكة تم اختيار غابة توزي لاغراض هذا البحث.

تم أخذ عينات من التربة تحت أشجار الهشاب والطلح الطبيعية علي بعد مسافة 1,5م من الشجرة علي عمق 0-30 سم كذلك تم اخذ عينة من تربة خالية من الاشجار في نفس المنطقة للمقارنة وتم ارسال العينة الي المعمل حيث تم تحليلها وتم تحديد عناصر النيتروجين الفسفور والبوتاسيوم بها كذلك تم اخذ عينات من اوراق اشجار الهشاب والطلح بالمنطقة و تم تحليلها ومعرفة عناصر النيتروجين الفسفور والبوتاسيوم المكونة لها كذلك تمت دراسة اقتصادية اجتماعية للمجتمعات حول الغابة حيث تم تصميم استبيان لعدد 79 مواطن يمثلون عينات عشوائية لعدد اربع من القرى حول الغابة وتم تحليل البيانات بواسطة الحزمة الاحصائية للعلوم الاجتماعية SPSS .

أوضحت الدراسة ان عنصر النيتروجين موجود بكمية اكبر تحت اشجار الهشاب والطلح مقارنة بالارض التي تخلو من الاشجار وعنصر الفسفور يوجد بكمية اكبر تحت اشجار الهشاب كما ان البوتاسيوم يوجد بصورة متساوية في كل المواقع عموما تعتبر التربة تحت اشجار الهشاب والطلح افضل من تلك التي تخلو من هذه الانواع الشجرية كما اثبتت الدراسة ان اوراق شجرتي الهشاب والطلح غنية بعناصر النيتروجين الفوسفور والبوتاسيوم.

خلصت الدراسة الي ان المنطقة كانت غنية بهذه الانواع الشجرية كذلك اوضحت الدراسة الي انه ممكن معالجة ذلك التدهور باعتبار ان بيئة منطقة الدراسة مازالت مناسبة لزراعة هذه الاشجار حيث تاكد ان زراعة هذه الانواع الشجرية يعمل علي اعادة خصوبة التربة .

Table of contents

contents	Pages
Approval page	
Dedication	i
Acknowledgement	ii
Abstract	iii
Arabic abstract	iv
Table of contents	v
List of Photos	xi
List of figures	xii
List of tables	xiii
Abbreviation and acronyms	iv
Chapter I introduction	
1.1 Introduction	1
I.2 Problem statement	3
1.3. Objectives	3
Chapter II Literature Review	
2.1. Introduction	4
2.2. <i>Acacia senegal</i> tree	4

2.2.1 Habitat	7
2.2.2 Geographical Distribution	8
2.2.3 Growth and development	10
2.2.4. Tree Management	11
2.2.5. Functional Uses	11
2.2.5.1 Products	11
2.2.5.2 Services	12
2.2.5.3. Dune stabilization	13
2.2.6 Gum yield of hashab tree	13
2.2.7. Pests, diseases &natural Hazards	14
2.2.8. Influence of <i>Acacia senegal</i> on soil	14
2.3 The <i>Acacia seyal</i> Tree	15
2.3.1Distribution	17
2.3.2 Habitat	18
2.3.3 Formal stands	19
2.3.4 Growth rate and production	19
2.3.5 Nodulation	20
2.3.6Seeds	20
2.3.7 Pests	21

2.3.8 Uses of <i>Acacia seyal</i>	21
2.3.8.1 Products	21
2.3.8.2. Tannin or dyestuff	22
2.3.8.5. Services	23
2.3.8.7. Folk Medicine	23
2.4 Factors affecting tree growth	24
2.4.1 Climatic factors	24
2.4.4 Insects	25
2.4.7 Drought	26
2.4.8 Essential Elements	27
2.5.1. Harvesting	28
2.5.2 Gum Arabic Applications	29
2.5.3. Food applications	29
2.5.4 Pharmaceutical applications	31
Chapter III Study area	
3.3 Population	33

3.5 Topography	34
3.6 Climate	35
3.6.1 Rain fall	36
3.6.2 Temperature	36
3.7. Vegetation cover	38
3.8. Land use	39
3.8.1 Water resources	40
Chapter IV Materials and Methods	
4.2.1 Soil sampling	42
4.2.2 Leaf analysis	43
4.2.2.1. Methods of determination of NPK	44
4.2.4. Socio-economic Study	45
4.3 Statistical analysis	45

Chapter V Results and Discussion	
5.1. Soil analysis	46
5.1.1 Total Nitrogen	46
5.1.3 Potassium	47
5.1.5. Soil PH and texture	48
5.2. leaf analysis	49
5.3 Comparison between vegetation map (1962-2013)	50
5.4 .Socio-economic study	52
5.4.1.The educational level	52
5.4.2.The source of income	53
5.4.4.3 The suitable part for tapping	54
5.4.4. The Uses of Gum trees	56
5.4.5. Factors contributing to the degradation of gum trees	58
5.4.5.2. Animals (over grazing)	60
5.4.5.3. Insects	61
5.4.5.4. Wind Factor	62
5.4.5.5. Wildfire	62

5.4.6. Gum trees cover	64
5.4.8. Legislation	64
Chapter VI Conclusion and recommendations	
6.1.1. Soil analysis	67
6.1.2. Leaf analysis	67
6.1.4. The socio-economic study	67
6.1.5. Gum Arabic uses	69
6.2. Recommendations	69
References	71
Appendix I	76

List of Photos

No	Contents	Pages
1	Gum from (<i>Acacia senegal</i>).	7
2	Gum from (<i>Acacia seyal</i>)	17
3	Soil Sampling	43
4	Leaves sampling from hashab	44
5	Leaves sampling from Talh	44

List of figures

No	Contents	Pages
1	The map of the study area	33
2	Temperature, Rain fall, and Relative humidity	36
3	The important elements in both species	50
4	The map of vegetation cover in 1962	51
5	The existing vegetation cover	52
6	Source of income	54
7	The activities of human	60
8	wildfire	64
9	Density of <i>A .senegal</i> and <i>A .seyal</i>	65

List of Tables

No	Table	Pages
1	Table (3.1) Climatic data	37
2	Table (3.2) Reserved forests	39
3	Table (5.1.1) The Important elements in all sites	47
4	Table(5.1.2) PH reaction in all sites at the study area	48
5	Table (5.1.3) Soil properties beneath all sites	49
6	Table (5.4.1) Male and Female	53
7	Table (5.4.2) Educational level	54
8	Table (5.4.3) Martial Status	53
9	Table (5.4.4) knowledge about the gum tree tapping	55
10	Table (5.4. 5)The suitable season for tapping the Hashab	56
11	Table (5.4.6) The main part of the tree suitable for tapping	56
12	Table (5.4.) Important use of Hashab trees	58
13	Table (5.4.8) Important use of Talh trees	58
14	Table (5.4.9) The Important use of Gum	59
15	Table (5.4.10) Awareness about the importance of gum	60
16	Table (5.4.11) people depend on gum trees	60

17	Table (5.4.12) The participation of local people	61
18	Table (5.4.13) The number of the animal	62
19	Table (5.4.14)The type of the animal	62
20	Table (5.4.15) The effect of locusts	63
21	Table (5.4.16) The effect of wind	63
22	Table (5.4.17) Extension activates	66
23	Table (5.4.18) The legislation of forests	66

List of the main acronyms and abbreviations

FNC	Forests National Corporation
Ha	Hectare
ppm	Parts per million
NFI	National Forest Inventory
N PK	Nitrogen, Phosphorus, Potassium
OC	Organic Carbon
SPSS	Statistical Package for the Social Sciences
C	clay
Si	Silt
G.I.S	Geographical Information System
R.S	Remote Sensing
Eva.	Evaporation
Dir	Direction
KMPH	Kilometre, mean, per hour
Temp.	Temperature
US	United States
Dept	Department