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REVIEW ARTICLE

STUDY OF FLOWERING PLANTS AND VEGETATION COVER IN WADI MANAS JABAL AL-AKHDAR, LIBYA

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ABSTRACT

The study aimed to enumerate and classify the flowering plant species that were randomly collected from different regions of the study area during the years 2009-2010. The seeds of Gymnospermae are of two families and there are two types, while the angiosperms plants are 184 families divided into Dicotyledoneae, which contained 39 families, 111 genera, 147 species and 37 plant species of Monocotyledoneae. It contained 7 families, 37 species and 30 genera Recording of 12 endemic plant species, life forms, the highest percentage of Therophytes was 53.76%, then the short-lived plants Chamaephytes 30.10%, then the terrestrial plants 11.82 %Cryptophytes, and the long-perennial plants Phanerophytes4.83. Investigate the vital natural factors, as these plants were not studied in the study area in the past, as well as filling the gaps in the Libyan flora of the Manas - valley, which is located in the north-east of Hamda, descends north towards the sea and ends in the coastal area at the village of Al-Mabani.

KEYWORDS

The Green Mountain Manas, Libyan Flora, Endemic Plants, Life Forms

1. INTRODUCTION

The study dealt with the Manas Valley basin as it is characterized by a vegetative cover. Preparing wild plants that constitute the main part of the vegetation cover.

The taxonomy of flowering plants is defined as one of the important branches of botany, and it is concerned with the study of flowers produced by higher plants, and the arrangement and classification of all these plants into division units (type - genus - family - rank.....) on the basis of the flower's composition in These plants. This science is also concerned with naming plants in a sound scientific manner, and subjecting the botanical nomenclature to Global fixed rules so that there is no repetition and confusion in the names of plants in the whole world. [19] The taxonomy of flowering plants is closely related to various other branches of botany, such as plant flora, plant geography, plant societies, plant morphology, genetics and others [19]. Plants differ among themselves in size, shape, organization, color, life cycle, distribution, and environment. With the passage of time, scientists were able to develop this division and realized the necessity of separating different plants, according to limited qualities, and knowing the scientific names of plants that were agreed upon by vegetarians, so that there would be one regular and consistent name for each plant species, [6] The vegetation cover in Libya is considered poor compared to the common area, which is estimated at about 1,760,000 million km2, while the number of Libyan plant species is estimated at about 1,750 species, according to 744 genera distributed among 118 families. The coastal strip represents 5.5% of the total area of Libya, but it is the most fertile, with seasonal rain falling at a rate of 150 to 600 mm annually [21]. The study area is characterized by a Mediterranean climate, which led to a diversity of plant communities and fluorescent composition.

2. STUDY PROBLEM

This study was chosen because of what was observed of soil erosion and a steady decrease in the natural wild plants, which were characterized by their abundance and diversity, which led to asking several questions as follows:

Q1: Do natural factors have an impact on plant diversity in the study area?

Q 2: What are the reasons that led to the weakness and lack of growth of wild natural plants?

Q3: What are the most important types of natural plants prevalent in the study area?

Q4: Does the human activity that invaded the study area have a role in the lack and weakness of the growth of wild natural plants?

Objectives of the study:

The study aimed to investigate the vital natural factors.

Standing and identifying the fundamental reasons that led to the decrease in the growth of plants in the study area.

Inventory of the species present in the study area.

Classification of three species in the herbarium and then comparing them to the Libyan Flora Encyclopedia.

- Develop a guide for the families, genera and plant species of the families that have been studied in the study area.
- Identification of plant and endemic species of plant species in the study area.

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3. The Importance of Studying

The importance of this study lies in the prominent role of knowing and clarifying the wild flowering plants present in the study area.

Study Methodology:

Descriptive approach: The study relied on field visits to the study area throughout its chapters.

Numerical analysis: by taking samples from the study area and classifying them using Libyan flora.

Secondary studies: in which it relied on previous studies:

The vegetation in Libya has received many taxonomic studies for a long time, as the history of the exploration of Libyan wild plants goes back to the world (1703) Lemaire when he studied some archaeological remains from the Cyrenaica region, and explained his vision of the Sylphium plant, which he called Selfione, and confirmed that it matches Specimens still preserved in the herbarium of Paris, which were finally confirmed to be Phlomis Floccosa (Lucas, 1712). Also the collection by Cella- Della (1819) the areas located along the coastal strip from the city of Tripoli to the Egyptian border, after they collected more than 260 plant species, including 132 species of these plants collected from the Cyrenaica region. And a study carried out by Vivianii (1824) reviewing these gatherings, and I studied and recorded their results in an author that described some new species, and this work is the modern start in the study of wild plants in Libya. A study conducted by Boulos (1962-1972) collected seven thousand plants from different regions of Libya, from 1976 to 1986, and over a period of approximately ten years, the Encyclopedia of Libyan Plants was implemented. And study he did! Ali & Jafri El-Gadi - & Jafari (1976-1986) compiled and revised all previous studies on the Libyan flora, which included (150) species. This study was followed by several researches and studies, including an analytical study of Libyan plants available for division for the division of Libyan flowering plants, a statistic was established by both of El-Gadi - & Qaiser (1984). This study included 1750 species of vascular plants belonging to 744 genera distributed over 118 plant families. Furnari & Brullo (1994) published their study of the Benghazi plain and added a new species. It is Euphorbia Brullo gebelica [21].

4. Study Area

The Manas Valley Basin is located in the northeastern part of Libya, about 72 km east of Benghazi, and about 28 km west of Al-Marj city.

As for astronomy: it is located between latitudes 32.25°-`.15 32°N, and longitudes 20.35`-،30°20°E.

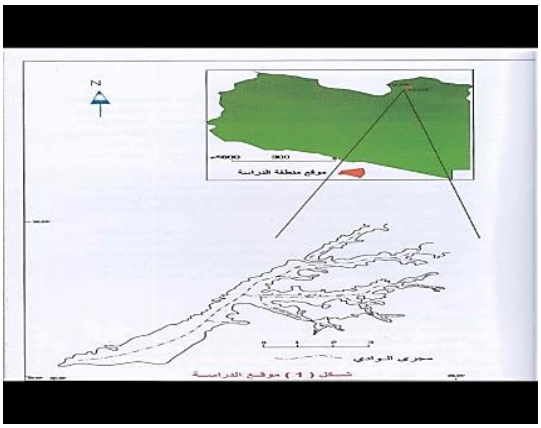


Figure 1: Study site

Research source. Land Sat8 satellite and Arc gis

The study area was divided into three areas, as follows:

The first area: It is represented at the foot and sides of the valley and is characterized by the presence of vegetative cover.

The second region: It is the middle of the valley and does not show any marine effects.

The third region: This region represents the bottom of the valley.

5. The Climate

The climate of the study area prevails in the Mediterranean Sea, which is characterized by warm and humid winters and hot dry summers, which affected the plant species in the study area in terms of quantity and type. It reached 572.7 mm in 1997, while the lowest annual average total amount of rain was 202.4 mm in 1990, where the table shows the discrepancy in the amount of rain from another year and given the monthly average of rainfall rates as in Table (2) and Figure (2), we note that The highest monthly average total amount of rain falling is 89.59 mm in December and the lowest monthly average total amount of rain, in which the average precipitation reaches zero in both July and August and June. where it was noted that the total monthly average amount of rain for the year 2007 AD amounted to 448.8 mm. It was noted that the highest amount of the monthly average amount for the year 2007 AD was 210.0 in December and the lowest monthly average amount of rainfall reached zero in the following months: April, June, July, August and September.

Table 1: Monthly Averages of The Amount of Rainfall Mm for The Years from 1989-2000.

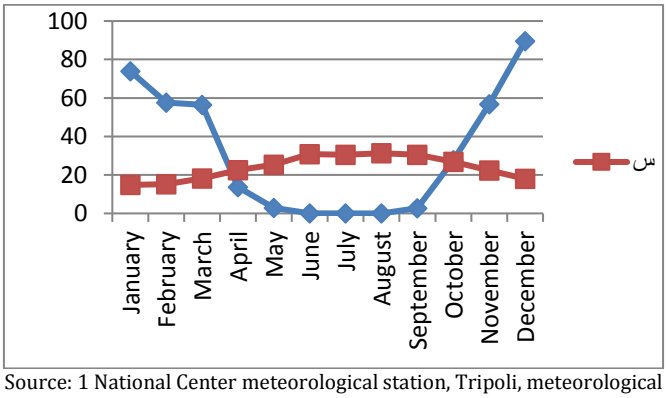
Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual Average
Monthly Average	73.94	57.64	56.4	13.68	2.85	0.02	0	0	2.66	27.75	56.75	89.59	395.64

Source: 1 National Center meteorological station, Tripoli, meteorological station Marj from the year1989 – 2000.. The temperature varies from season to season, we find that the highest temperature in August reaches 31.26 m and in June it reaches 30.79 m, while the coldest months of the year are in January up to 14.83 m, February reaches 15.26 m and December reaches 18 m.

Table 2: Monthly Averages of Temperatures for The Years from 1989-2000 AD.

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual Average
Monthly Average	14.83	15.26	18.16	22.44	25.26	30.79	30.44	31.26	30.425	26.9	22.425	18	23.975

Source: 1 National Center Meteorological Station, Tripoli, Meteorological Station Marj From The Year1989 – 2000.



Source: 1 National Center meteorological station, Tripoli, meteorological station Marj

Year January February March April May June July August September October November December Annual average Figure (2) shows the monthly averages of temperatures and the amount of rainfall in mm from 1989-2000 m As well as the relative humidity and its role in the biodiversity in the study area, where the percentage of humidity increases in winter to reach 66. 76% in January, while it decreases in summer in June to reach 53.91%. Also, winds have an effect on vegetation cover, whether by mechanical action or increasing transpiration in plants, which leads to its drying.

6. Study Materials and Methods

The process of collecting samples for the study area took place from January 2009-2010 throughout the year, and from Different places in the study area, where it was taken into account in the collection of plant samples that the samples are in the flowering or fruiting stage due to the

importance of Classification and plant samples were collected and placed in plastic bags and transferred to the Faculty of Science, University of Benghazi for the purpose of drying And preserved and recorded the scientific name, family name and date of collection after it was defined in the Cyrene herbarium in the Botany Department - College of Science - Garyounis University using the various taxonomic encyclopedias, the most important of which is Flora of Libya, where the identification is confirmed by comparing it with the samples found in the Libyan Flora herbarium.

7. Results

First: Soil Methods used to analyze soil samples:

Samples were collected from the study area Samples were collected from the study area (the foot of the valley, the middle of the valley, the bottom of the valley) and they were taken from each sample area.

Soil analysis results.

Table 3: Soil Texture (Mechanical Analysis).

Number	Sectors Indicate The Percentage of Sand	Sand%	Silt%	Clay%	Soil type
1	Deep Valley Area	%16.00	%27.28	%56.72	Clay
2	Valley Foot Area	%18.00	%29.28	%52.72	Clay
3	Central Valley	%14.00	%39.28	%46.72	Clay

The mechanical analysis of the samples taken from the study area confirms that the soil type of the study area is clay soil, and it is one of the red soils characteristic of the Mediterranean region, which is characterized as fertile because it is rich in iron, as shown in Table (3).

Table 4: Chemical Analysis of The Soil of The Region.

Number	Sectors Statement	Electrical Connection	Acidity	Dissolved Salts	Organic Matter O.M %	Organic Carbon
1	Deep Valley Area	E.C Ms/Cm	(PH)	TDS (Mg / L.)	1.69	O.C%
2	Valley Foot Area	0.226	7.44	129	2.03	0.98
3	Central Valley	0.909	7.37	460	5.96	1.18

Through the chemical analysis of the study area, we find that the percentage of electrical conduction, which is meant by the percentage of soluble salts in the soil, is a direct relationship between the percentage of soluble salts and the electrical conductivity, that is, the higher the percentage of electrical conduction, the greater the amount of soluble salts in the soil, and through the results of the physical-chemical analysis there is a clear difference Among the valley areas in Table (4), where the electrical conduction in the area at the foot of the valley is 0.909 mm/cm^2 / 25 m, followed by the middle of the valley, in which the electrical conduction is lower and reaches 0.305 mm^2/cm^2 / 25 m, then from the depth area The valley, in which the electrical conductivity is 0.226 mm^2 / cm^2 / 25 m. The study area is characterized by a very weak alkaline soil, so it takes in the first order the valley bottom area, whose pH ratio reaches 7.44, and then it is followed byIt is followed by the area at the foot of the valley, which reaches a percentage (pH) of 7.37, then it is followed by the area of the middle of the valley whose percentage (pH) reaches 7.24. We note that the area of the middle of the valley is characterized by high fertility, with a percentage of organic matter O.M%, which reaches 5.96%, as well as organic carbon O.C%, which Its percentage reaches 3.46% compared to the rest of the study areas.

Table 5: (+) Cations for The Soil of The Region.

Number	(Ca)		(Mg)		(Na)		(K)		Sodium Adsorption Rate (SAR)
	Mg/L	Meq/L	mg/L	meq/L	mg/L	meq/L	Mg/L	meq/L	
1	22	1.10	4	0.10	26	1.125	4	0.10	1.26
2	109	5.45	11	0.29	69	3.00	11	0.29	1.70
3	45	2.25	9	0.23	28	1.225	9	0.23	1.05

It can be seen from Table No. (5) through the chemical analysis of cations in the study area, where the highest percentage of calcium (Ca) is found to reach mg/L109 in the area of the foot of the valley, while it is followed in the second place by the area of the middle of the valley, which represented the ratio of mg/L 45, then followed by the area The bottom of the valley (the bottom of the valley), which represented the percentage of calcium (Ca) in mg/L 22, while the percentage of magnesium (Mg) reached the highest percentage in the area at the foot of the valley where it reached 9 mg/L, while the percentage of magnesium is equal in the middle and bottom areas of the valley It is represented in mg/L 6, while the highest percentage of sodium (Na) in the study area at the foot of the valley is 69 mg/L, while the percentage of sodium is close to in the regions of the middle of the valley and the bottom (bottom of the valley) represented in the middle of the valley is 28 mg/L, while L 26, while the percentage of potassium (k) reaches its highest percentage in the area at the foot of the valley represented by mg/L11, then followed by the central valley area represented by mg/L9 and then followed by LogicIt is followed by the bottom area (lower valley) mg/L4, sodium adsorption rate (SAR), where the area at the foot of the valley represents the highest percentage of it reaching 1.70, then followed by the depth of the valley area (lower the valley) represented by the rate of 1.26, then the central valley area as the rate of 1.05 . how much.

Table 6: Ions (-) For The Soil of The Region.

	Mg/L	Mg/L	Meq/L	Mg/L	Meq/L	Mg/L	Meq/L	Mg/L	Meq/L
2.0	Nothing	10	0. 20	14	0.40	93	1.525	Nothing	Nothing
2.5	+	51	1.06	177	5.00	67	1.10	"	"
Nothing	Stirred	20	0.425	28	0.80	101	1.65	"	"

It is clear through the chemical analysis of the ions in the study area that the study area contains carbonates (CO3), while the percentage of dissolved bicarbonate (HCO3) reaches its highest percentage in the middle of the valley, represented by its ratio of mg/L 101, then followed by the depth of the valley area (lower the valley), represented by its percentage in mg/L93, followed by the area at the foot of the valley represented by the ratio of 67 mg/L, while the highest percentage of chlorine (CI) in the area at the foot of the valley represented by the percentage of mg/L 177, then followed by the central valley represented by its percentage in mg/L 28, then followed by the area The bottom of the valley (the bottom of the valley) represented by its ratio of 14 mg/L, while the highest percentage of sulfate (SO3) reaches in the area at the foot of the valley represented by a percentage of 51 mg / L, then the ratio is close between the two central areas represented by its percentage of mg / L 20 and the valley bottom area represented by its percentage At 10 mg/L, while there are nitrates (Na) in the foot of the valley, while there are traces of nitrates in the middle of the valley, while the valley floor area (the bottom of the valley) has no nitrate, while the percentage of calcium carbonate (3CaCO) is % as a result of the rock carving process as well as soil erosion due to rainfall. Calcium carbonate (CaCO3)%, followed by the central valley, there is no calcium carbonate (CaCO3)%.

8. Discussion

(186) plant species were collected and classified (in Appendix 1). Numerical analysis was carried out on the collected species represented by (143) genera and belonging to (47) families, divided into gymnosperms and angiosperms, of which two types of gymnosperms It belongs to two

sexes and one family with a percentage of 1.07%, and (184) species of Angiosperms are representedB (46) families, divided into dicotyledons and one cotyledon. The first represented (147) species, (111) genera and (39) families with a rate of 79.03%, while monocotyledonous plants were represented by (37) species and (30) species and (7) families with a rate of 19.89% as shown in Table (7), by comparing the number of plant species collected in the study area with the number of species for some areas of previous studies in Jabal Al Akhdar as a study [7] of Wadi Al Asra, where 244 plant species were collected from the study area belonging to 57 families, as well as a study [4] which collected from the study area of Wadi al-Aqar 317 plant species belonging to 66 families, as well as a study [12] where 336 plant species belonging to 61 families were collected from the study area of Wadi Zaza. , as well as a study ([6], 2007), which collected from the study of vegetation cover and the seed stock in the area extending from southern El-Marg to Wadi El-Kharouba, where 189 plant species belonging to 56 families were collected. The reason for the small number of plant species is because it is an open area in which various human activities abound, which will negatively affect the increase in the number of plant species. Most of the vegetation cover is concentrated in Valleys Because of the safe havens offered by these valleys in which environments are available with the appropriate factors for intensive growth of plants from high humidity, soil and protection. As for medicinal species, the percentage of plants with medicinal use in the study area represents 16.66%, which no longer grows at their natural rate due to random collection processes. These include carob Ceratoinasiliqua, rabbit grass Helichrysumstoechas, olives Oleaeuropaea, Cistusparvifolius, thyme, Thymus capitatus, Ajugaiva, Globulariaalypum, and Rhus tripartite. And the uprooting of bulbous species such as Asphodelusmicrocarpus and Pharaoh Urgineamaritima. The danger of depleting these species lies in the lack of growth and stability in their natural habitats due to human activities.

Table 7: Shows The Division of Plant Groups Obtained From The Study Area.

Number	Plant Aggregates	Number of Species	Number of Genera	Number of Families
1	Gymnosperm	2	2	1
2	Cotyledons (Dicotyledons)	147	111	39
3	Cotyledons (Moncotyledons)	37	30	7
4	Total	186	143	47

The plant species in the study area were classified using the life form spectrum analysis method, according to the classification of the world Ronkair (1934Raunkiaer's classification, which is based on the height of the developing tops and buds above the surface of the earth, and the living forms of the study area were classified into 4 sections.

A- Tall perennial plants (height of regeneration buds is more than 25 cm) Phanerophytes. These plant species include perennial buds growing on the aerial parts, 9 plant species were classified, which represented 4.83% of the total plants collected from an area and include large woody plants (trees and shrubs).

B - short perennial plants (height of regeneration buds less than 25 cm) Chamaephytes

These plant species include perennial buds growing on aerial parts close to the surface of the earth (the length of these plants is less than 2 m) and is considered the second largest section in the study area. Most of them are listed.

T-Terrestrial Cryptophytes

Plants of this group are characterized by the production of rhizomes, bulbs or tubers, and 22 plant species have been collected, representing a percentage of 11.82%.

W-Therophytes

The plants of this group are the largest sectionsIn the study area, where plants tolerate unsuitable conditions and remain in the form of a seed and are active and complete their life cycle in the appropriate season, 99 plant species have been collected representing 53.22%.

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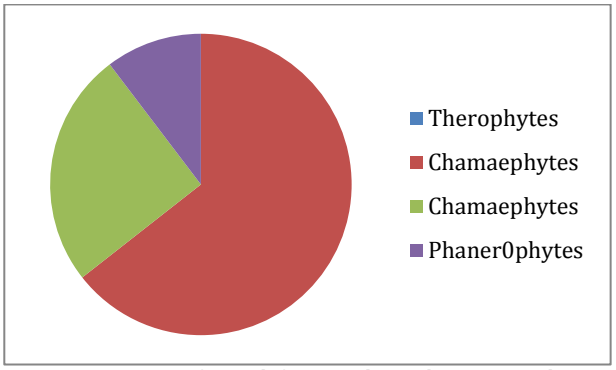
Figure (3) Percentages of growth forms in the study area according to the system (1934Raunkiaer).

The dominance in the growth forms of annual species was (53.22%) (99) plant species, followed by short perennial plants (56) plant species, which represents 30.10% of plant species. By comparing the growth forms in the study area with some previous studies, it was agreed that the dominance was for annual plants Despite the different percentages, where the percentage of annual plants in the study [12]was 57.14% [4] and the percentage of annual plants was 50.1% [7] while the percentage of annual plants in the region The study is 53.22%, and the plant life in the previous areas depends on rain only, and the valleys in it remain



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By comparing the order of the plant families in the study area and the order of families in the Libyan flora in terms of the number of species in Table (8), it was found that the compound family Asteraceae comes first in the study area, as well as in the Libyan flora, where it represents 16.12% of the region's plants, while the species represent Which Of the plants of the region, while the species collected from the study area represented 12.5% of the compound family in Libya, while the second order in the study area was the legume family Fabaceae, representing 11.82% of the plants of the study area, and the arrangement of this family is the third in the Libyan flora and represents the species that Of them were collected in the study area, 11% of the legume family in the Libyan flora, while the third rank in the region was the Poaceae family, which ranked second in Libya, where it was 11.29% of the plants of the region, and the percentage of plants collected from them was 9.54% of the Poaceae family in Libya.

The endemic plants in the study area represented 6.45%, and it was noted that there is a similarity in the ratios with the previous studies, and it was my percentage6.7% . [6] and 5%[6] and 5.6% [4] and 5.35%[12] Which mentioned that the percentage of endemic plants in Libya represents 4% of the Libyan flora [15].

The slopes of the region were characterized by the spread of drought-resistant species such as Cistusparvifolius and Phlomis floccose. These species are characterized by the fact that they can grow in conditions of significant water shortage, meaning that they are drought plants (Opparihermer, 1951). The percentage of plants with pastoral use in the study area represents 83.33%, where the continuous overgrazing in the Barabis Valley on plant species reduced them and reduced their numbers. Animals when feeding on selectively palatable species lead to their extinction because they reduce the number of seeds and remove flowers.

It has been observed that the plants have not multiplied due to overgrazing, which affects the reproduction of plants, as the production of grazing plants from seeds is greatly affected, depending on the time of

grazing and grazing during the period. Grazing during the period from the beginning of the formation of flower buds to the formation of seeds leads to a significant decrease in the number of seeds, and according to the degree of grazing.

The study area was characterized by the presence of 12 types of endemic plants, and these species are common in Jabal Al-Akhdar, as mentioned in previous studies.

Table 8: Shows The Endemic Plant Species in The Study Area (2009-2010).

Asteraceae	*Bellis sylvestris var . cyrenaica* Beuinot . *Centaurea cyrenaica* Beguinot & Vacc. *Cynara cyrenaica* Maire & Weiller . *Onopordum arenarium* (Desf.) Pomel , Nouv .
Alliaceae	*Allium longanum* Pamp .
Araceae	*Arum cyenaicum* Hruby.
Ericaceae	*Arbutus pavarii* Pamp .
Primulaceae	*Cyclamen rohlfsianum* Asehers .
Orchidaceae	*Orchis cyrenaica* Durad & Barratte , FI .
Ranunculaceae	*Ranunculus cyclocarpus* Pama.
Plantaginaceae	Plantago cyenaica Durand & Barratte
Iridaceae	*Romulea cyrenaica* Beguinot in Engler, Bot.

It was also noted in the valley under study that the valley plants were clearly affected as a result of the residents living near the study area cutting down trees and using them as firewood, as well as making charcoal. (number and density), which will affect the balance of the ecosystem in these areas, and this is consistent with what was stated by [12]and[2] .

Where the cutting process affected the pavarii arbutus plant in particular, despite it being a fast-renewing plant, but due to the continuous cutting process, it reduced the density of this plant in the area and may lead to its elimination.

RECOMMENDATIONS

1- Work and be careful not to remove the plants, which collectively constitute the vegetation cover of the soil, by spreading awareness among people about the importance of these plants and their vital role in wildlife.

2- Taking into account that the plants are harvested as medicinal herbs in a scientific manner by preserving their roots.

3- Work to reduce the cutting of trees and shrubs that will serve as charcoal, through advice and guidance, by activating the role of environmental control in implementing deterrent penalties for every waste and those who do this unfairly.

4- Establishing controls that would put an end to the grazing of animals and the exploitation of places where wild plants grow, such as pastures and agents, in order to maintain the balance of vegetation cover and not to spread the phenomenon of desertification.

5- Reducing the phenomenon of logging because of its negative effects on the vegetation cover because it leads to the disappearance and extinction of many types of plants or reduce their density.

6- Spreading awareness among the people who take trips to the study area by not leaving their waste that may negatively affect the vegetation cover (plastics).

7- Continuing with this type of studies until most of the vegetation cover is covered in the mountains, valleys and plains of the Green Mountain.

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