

THE SIMULATION ENVIRONMENTAL GEOLOGICAL OF DESERTIFICATION PHENOMENA IN LIBYA

Fathi Elostia

People's Committee for Education and Scientific Research in Tripoli
Janzor academy postgraduate studies Earth sciences Department Geological Section master student
Hmbstf@yahoo.co.uk

ABSTRACT

Since 400million years ago, the Libya had witnessed geological activities resulted in formation of the physical landscapes of the Libya and formation of the oil and groundwater basins. After the preliminary development of the system of the Tectonic processes during the development stage of karmi & Permian Tish sea water revolved to cover huge areas of the Libyan territory until got to Tibisti mountains, then revolved back until in the Pleistocene epoch a climate change caused rain shortage formation of a Rock layers, hills and huge sand dunes thus creating more desert situation then causing sand dunes extending to huge areas thought the Libyan areas (1,700.000) km². It is believed that the forth geological epoch had formed most of the Libya Landscape. Libya is situated within the sub dry climate is characterized with rarity of rain fall, which in then caused a wide spread of desertification where huge fertilized hands became dry areas, lacks plantation and animals, therefore resulting in a very poor environmental. The phenomena of desertification is due to far always climate condition as a result of drop in rain fall, in addition to the situation as a result of the area within a sub-desert climate, causing a rise in evaporation rate transpiration a drop in soil moisture high rise in CA+ HCO₃ and bi-HCO₃ thus causing the spread of swamps and therefore rarity of plant cover in particular in the western rang.

Also the intensive irrigation process caused increase in soil salt to become a salt soil not fit for agriculture or for constructions cutting trees in addition to improper pastry. The climate conditions have played a vital role in water shortage which is one of the main problems causing an increase in desertification process.

In this study we propose for desertification eradication to use silica formation 90% of rocks metals of the earth sphere .such process come as a result of fusion. This metal is common in all earth rocks and is characterized with the ability to absorb water molecules in order to be able to form of water and provide the same to plant roots, then again compensate whatever quantity of water which may be lost by absorption of air moisture containing water.

The square meter needs 25-50kg of silica further we may attempt to fix the sand dunes and stop their marsh by planting pine trees ,oak construction of a water hole to reserve rain water in and outside of the cities and villages in order to benefit from it in crops irrigation .also eructation of five purification plants along the Libyan coast to process rain water and sanitary drainage .

This water must be used in soil fixing besides preservation of the Great Man made river which must be used for drinking purposes only. In addition to be above one may use remote sensing to be control soil marching and finding an economic plan of plantation in and outside of cities and villages via frees distribution of trees on citizens establishment of prairies within cities contraction of wind buffers around them so to prevent march .

INTRODUCTION

Know as desertification change in the properties which will lead to the creation of more drought and desert condition and deepening of the conditions of desertification through the reduction and deterioration of the load and hide the bio-energy for the ecosystem.

The natural conditions of the causes of the desertification process in the world where Walt talked climate change lead to a rise in the second xi carbon layers supreme leading to more droughts and less rain. And Libya from one of these countries that have experienced the phenomenon of desertification, due to climate conditions the moving sand dunes are heading to the result of the changes happened during the Paleocene in the era of the quartet which is believed to be a most natural feature. It seems that this topic its setting has during the Jurassic period, which include sandstone and limestone and clay which is covered with stratified deposits of sand dunes beneath the reservoir containing water and oil are concentrated in the south and center. And these deposits vary in concrete construction. Also has surface-general of the study area with some light ripples also contains volcanic cones and inciting strife. Spill along the surface of the year, but the sediment is the dominant sand dunes which rise up, and all of these features formed during the demolition and contraction to be us and the great

sand seas, and divided the marshes sand dunes and basalt deposits.

Most of these deposits formed in shallow environments may constitute a solution to the problem of desertification if it is used with due to the rock and is working to hold the water for the benefit of the plant during time.

All of these natural features during the deposition process of building demolition, which were exposed ground during the Libyan Oligocene and Paleocene in triple time and the quartet .if we follow the geological evolution of the geographical times after we have noticed that sediment along the north ,south is an unconsolidated sediment exposed to different erosion due to natural fenders Like mountains and high plateaus is the geographical location and climate change over the centuries that passed by Libya is the main reason for the spread of the phenomenon of desertification in the region .

The problem of desertification in the Libyan disease concentrates activities than a quarter of this century as a result of the result of lower average precipitation and, where had become the prevailing drought most parts of the Libya.

The aim of this study is to try to find solutions to this phenomenon, the use o sediment windy containing granules grain immersed in the surface layer of the soil in most areas of north and vice admiral fadel especially also used scientific methods and advanced techniques to combat desertification

planting trees and wind breaks on aspects of urban and agricultural areas and the adoption of the long-term irrigation and use of remote sensing system in the fight against desertification control sand encroachment .

OBJECTIVES OF THE STUDY

The aim of this study is trying to challenge the extent of the phenomenon of desertification Libya ground and crept on the sandy ground and pastoral areas and try to find solutions suggestions to reduce the spread of this phenomenon and to high Light the spread of sand dunes and try to install the soil by adding grain rock in the mountain west and center to increase the proportion of low porosity dogging the entire ground Libya. As well as finding solution to the salt flats that are widespread in the west, Libya had become need to draft a national project is called desertification , which should be used remote sensing information to monitor sand movement and erosion of different operations in the whole landslide mass

GEOGRAPHICAL LOCATION:

Libya is situated in the central coast of North Africa and vast stretches turf Saharan Africa, bordered to the east of Egypt, from the south Sudan, Chad and Niger ,west of Algeria and Tunisia .Libya astronomer extends between longitudes 9 and 25 east and latitudes 25 18 and 33 north .

This is within the semi-arid climate, which is sometimes characterized by low rate of precipitation over the year , declines sharply towards the sea on the coast rise and fall in the south you will find further north ,covering most of its sand dunes because empty vegetation .

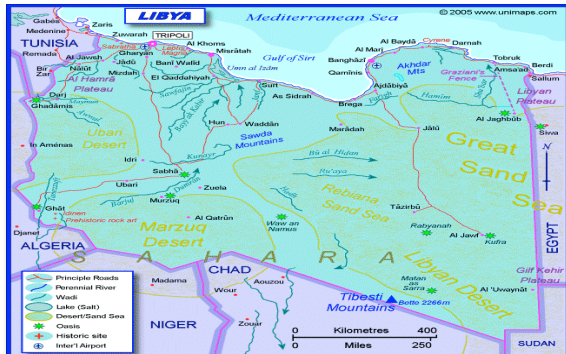


Figure .1. Map of Location study

THE MOST IMPORTANT AREA OF STUDY SEDIMENTARY

Enjoy mass along the long length of the southern coast of the Mediterranean, up to 200 m above sea level in western germane went down in the center and increase height has spoken to us we head east .

Divided the region into configurations sediment deposits and valleys and flats and shallow depressions and therefore deposit of river terraces and cliffs, sand dunes a wide spread. We note interventions sandstone with sand dunes, with a thickness of 23m reflects the presence of erosion subjected to erosion, water pouches in the western, northern parts of salt marshes overlaps with sand dunes with a thickness of 350m which sits on a vast area lacks the rocky highlands which plays a major role in

preventing the vegetation and the soil surface salty sea-water intrusion into aquifers of water, which Zadeh in the problem of desertification.

The eastern range note a high prevalence of red soil mixed sediment rock, clay, most of the valleys are not in the direction of an organized network of branches, which spread north, south in the center where the high side of the valley no more than about 5m that most of these shallow valleys rates active during the dry season rainfall, prevails in the region configurations and Eocene era where it appears in region of eastern explicitly soil formation, red, black knit.

Tnevsm configuration the region to deposits and deposits of valley and flats , shallow depressions and river terraces and while we note the widespread occurrence of sand dunes, where almost cover most areas of Libya , which mixes up thickness to 23m and reflects the presence of erosion ,landslides of water we note in the parts western north interventions also sand dunes , which may reach 350m thick and the great salt flats of up 120, km in area of the visitors and zaltan and abe-kemash it lacks the rocky highlands, which prevent soil erosion and Salinization while lacking vegetation w seawaters intrusion z aquifers as a result of the pressure drop the class .

The eastern range we note a high prevalence of mixed – rocky soil, which contributed to the spread of semi-heavy trees, and pastures and farms that rely on rainy season, but these areas need a water drainage system to prevent soil erosion and they lack the systems water storage in dams either the southern scale drought ,which we like be cause :_

- 1- Dimension with the sources of moisture.
- 2- Dry lack of systems rain storms.

The distances from the sea are the main cause in the process of drying the southern region, which contributed, to the spread of the great sand seas and dunes are widespread, with a thickness of 400m, there is the age of Eocene formations in the ranges of consecutive falls in you, II find further north and east, where in the south disappear under the sea and the sand dunes that were almost most of Libya territory.

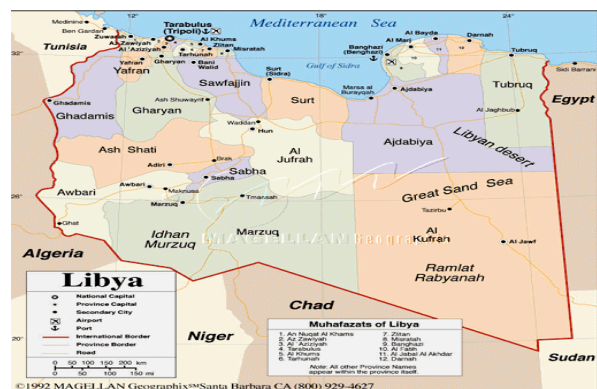


Figure 2. Configurations of Libya regions

COFIGURATIONS AND FOUR-TIME TAIK:-

These configurations include time for varying types of sediment and flood wind and sea, which basalt accumulates even in the present time of these deposits are:

- 1-Alluvial deposits:

Spread on the scope of the northwest area of Hamada in red, which depends on groundwater and irrigation systems lack of good as least by the rainfall area is speak dry .

2-bedrock the desert pavement: It covers the southwest and southeast which is overlapped with some gravel.

3-continental sand: Cover vast areas in the central southeast of the ranger and veins Which include deposits consist mainly of quartz.

4-sand beach : concentrated along the coast line from the head should be named by a calcareous sand mixed with callouts the navy ,we have no more than a narrow bar is 100m adjacent to marine coasts .this inward movement of sand by wind beach composed thickness up 12 ?

5-Rocky hills: it is formed as a result of the coherence of sand and limestone is concentrated in the mountain west and five.

6-sediment flats and bottoms: it is found in the eastern and western ranges, a term for salts which are deployed in a large that these deposits play a significant role in the mutually acceptable understanding the process of desertification and spread widely as a result of concern for nature reserves and openness of the region to plant and drift different.

THE MOST IMPOTANT GEOMORPHOLOHC FORMATIOS IN THE REGION.

Libya extends along the coastal plain of southern Mediterranean coast vary in height above sea level and are not dry valleys towards organized net work of branches in the north-western, north-eastern region particularly in the valley of the hills and will almjin valley gene and the other, but no more than the increase for both sides of the valleys 5 m. These valleys shallow and clear and often covered by the advancing sand dunes and marshes are found near the beach related to each other. In the region – pointing only rock area iii and iv include the plains where the third composition of the five episodes, which dates back to the Miocene period, which follows the sandstone and the plains of the quaternary period to include configurations where--- gergaresh and the mountain west and limestone which belongs to Holocene which also includes marsh sediments sands Beach water and sediment deposits as well as modern valleys. The most important configuration in the region:

III configurations eras of the composition of the five .it covers a limited area of the western part of the area and originally consisted of similar flats in the lower part consists of the composition of limestone Marley reflects the configuration episodes .

IV.this consists configuration periods of gergraesh composition of the crust is composed of Limestone rocks, where this configuration is alkalesh superman gray there is also a class as well as the intersection is marked with a cruising stretches along the eastern part of the region. The eastern part of the scope being expanded south wards and disappears into the Holocene show most of the surface rocks in the region in the form of reddish-brown crust rigid type with up to 2 m thick where as deposition configurations flats water and sediment deposition as well as the valleys of small modern sand bead greeted no configuration Holocene.

Theses sediments of small ponds within the continuum, stretching along the shore of a different shape from each other, the Holocene sediments are spread in different parts of the region except the beach, which is limited to the narrow belt expending along the bead. Also erosion can not affect the rocks of the region where the ill-pointing bows and meanders slightly from the sidewalks which are sedimentary show as well as some tears in the direction of the north-west of the region.

ANALYSIS OF THE NATURAL CONDITIONS:

First, geomorphologic conditions:-

Include all the surrounding plains of the period named by the head to the east to the west should be running large tracts descend sharply towards the inside which takes into gradually increase as we get farther from the sea, either east or west this elevation is and dunes, continue to rise to about 1600 almost above sea level to the north of the scope of the depressions occupied by the oases, the coastal plains of the region is a series of hills and sand dunes ,and some plateaus valleys where the main deposits in the north eastern red and black oil descend to the valleys of shallow semi-active during the dry seasons rain full, either the central part and descend to him and valleys will be empty the gene and Suez is large and slave from the south towards the north and the sate permanent flow, either the western part of it valley almjin and castor and others. These valleys may have played a major role in soil erosion to the due to the lack of dams and spread the desert bedrock and contain poor desert scrub important we can say that the high drought and low vegetation wildlife and a calcareous soil loose poor arid also contains calcareous soil organic loose and I said precipitation.

Second, the climate conditions of the region:-

A-Rain: - Libya from the areas controlled by the system of (Mediterranean climate hot summer rating winter dry) this climate is characterized by cyclonic rain that falls on the northern regions including eastern vice admiral fade especially because of the high and the ease of salutation with air .the average precipitation in the region to 200mm and less than in the western side of up to 100mm and less than in south up to 50mm. this is due to less air masses and the inability of the air saturation moisture ,also the location of the region in the semi-arid climate which led to the expansion of desertification area and who believes that circumstances change is the main reason for it .

B- in air pressure and wind:- air pressure plays an important role in moving the wind , which is one of the components of the soil sector. The study area is located within the areas of high pressure in winter and summer low-pressure areas and most of the region winds northeastern trade winds in winter and dry summer and the local over the site between two dry climate make the area where they operate by the northeaster basin and that caused the arability of region cyclone movements and lead to air currents carrying loose soil summer air as it moves from the high pressure to the north towards the tropical low pressure over the desert, which rises and drives the local winds due to low humidity and increase the rate of evaporation and transpiration , as a result of the lack of natural resources such as fenders mountains and hills make the region a reality in the wind-blown trade winds are especially strong winds because of the decrease in temperature and passed over land in the movement of sand dunes ,the local soil-borne winds around agriculture areas which reduces the production and the resulting lack of a move to vegetation and nature reserves .

SOIL REGION:-

Soil due to sediment the fourth time it deposits any newly formed because of the slow decline of the sea and is in these configuration :-

- 1- Deposits – dry
- 2- Recording desert
- 3- Salt marches to the lack of life and interaction.

This region is characterized by the presence of non-saline sonic soil and wetland contains a high percentage of salts and the pressure of salt horizon a high proportion of calcium carbonate, including **soils** :-

Soil coast line extend this range in the form of a relatively narrow strip along the sea from the top should be well-ramble the east the distance of 1900km at a depth of 100km and dominated by sub-humid climate in the high land areas where the :-

*Desert soil: it cover vast areas of the bed, al-hamada and south parts of the heat and interfere with the coast plain in some areas.

*Soil Mediterranean: a red structure is distributed in the eastern and easy where they overlap with the sand turned into sandy.



Figure 3. Types of soil in north Libya

WATER AREA:-

Water from the important things to sustain life on earth Libya is one of the water poor countries due to lack of precipitation and the Libya water due water and seawater intrusion and the Libya water due to low precipitation rate as well. The Libya of geographical access mala cause the air to maximize the fall semi-arid rain clouds that contain them on the slopes facing the wind, the landing of the air on the slopes of the background air is compressed by the decline continued and dry, so that temperature and humidity is relatively less, leading to total endowment of water evaporation in the clouds for these reasons this region is semi-arid ,low rain full and a climate of semi-desert Libya relies on groundwater resources of the existing reservoirs rocks almallision quarter in time .Where they are concentrated in Layers of sandstone , limestone and coherent pumping water from the safes at different depths so as to reach deepest in the northwestern part to 100m and pumped from the formation and dear abouchebp and average depth 70m to 350m sheep a well region , while water is pumped in the range north – eastern and south- eastern side of the basin contains a turf injury and Miocene and Pliocene ,depth of wells from 150m 200. This is consistent configurations with high porosity either the southeastern part contains rocks that this rocks that time quarter, which contain a large inventory of water is exploiting this stock

in the great Man river project which south kafa towards to north . Meson and to the water situation in Libya poor water sources because the water recharge in the low rate of precipitation Lang the year, which contributed to the expansion of the scope of desertification and land production of creaks and reduced vegetation cover, the high rate of evaporation and humidity, dry winter led to the deposits of the region . the large alluvial flats salt, gypsum, the spread of saline soils by drought throughout the region no lack of water (ph) such problems have affected the regions Economy and reduced the presence of dense plant cover and model farm. Here we must consider the problem of the establishment of water dams desalination plants along the sea coast and push it towards the region to river the industrial area and take advantage of the river, the settlement and various wildlife : - soil disassembled easily deployed in the western.

*soil sediment distributed along the coast saline.

*sand soil covering most of the Libya territory

Scale southern desert a soil poor are always to the wind because of the disintegration and sold habitat frequent which comprise the:-

*sandy soil, spread in most parts of Libya is non varying strength and dry in most areas of concentrated mass vice admiral especially in the south.

*sand soil of the continental margin, cover vast areas in the southern provinces, including Hamada red bed and infidels who are poor. That most of the areas covered by the Libya poor dry sandy soils and various soil types and is not having the capacity to retain water as a result of the very low on their lists .this is invasive of soils in Libya dry most of the year are poor in organic matter and contains limestone formation and the water level in dry most of the time and the moisture of the hot and dry ,desert covered bedrock are weak in construction .low power ,the formation of small clusters due to soil erosion disintegration ,the disintegration of granules ids not singular, but in the form of blocks all contributed to the spread and expansion of desertification area in Libya . Granules by calcium carbonate the soil interaction due to the presence $CaCO_3$ and bicarbonate salts ,organic matter decline and increase the mud ,also contain dissolved salts and gypsum .this lack of soil nitrogen are important in configurations protein deficiency and burn the tops and edges of the leave ,as well as a few and also contribute to the processes of photosynthesis and deficiency delayed maturity and poor roots of the problem of soil in this region due to the presence of salts significantly and drought throughout the year and the increase in transpiration and said organic material which does not retain water .

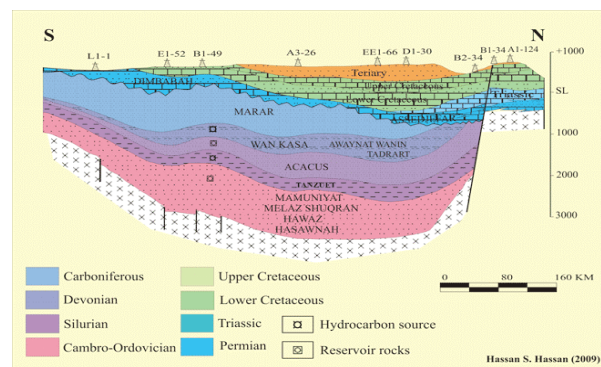


Figure 4. Cross section of reservoirs north west Libya

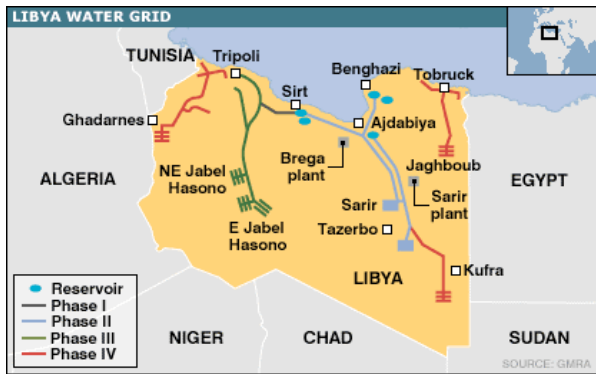


Figure 5. Map of Man Great River

TYPES OF SAND DUNES IN THE REGION:

***sand crescent:** The occur in the region not such a huge sand-offs, refers in the direction of wind movement in the wind is the source of the central role this type in the southern region, the spread of sand dunes in the region led to low activity which threatens agricultural production region, which is spreading along the coastal region of the high side chains of longitudinal flats , and given the very low this has resulted in a dunes in the low-lying areas and genesis in the form of ponds .and contains and dunes on 1% m and the degree of interaction (ph) usually confined to the 7.9 and the capacity of exchange of captions low due to lack of clay granules containing 1% to 10% calcium carbonate salts and contain a low percentage of nitrogen and the lack of the element phosphorus ,iron and zinc and it is very permeability making it a poor diet and chemically due to factors of disintegration and lack of cohesion ,which led to the conversion of this soil to the soil unsuitable for absorption and the inability to retain water because of the high permeability and the prevailing belief that the genesis of dunes in the region due to lack of vegetation and the activity of erosion and air and water erosion ,causing the elimination of a lot of agricultural .Land and the spread of sand dunes unfit for cultivation.

***soil erosion area:** soil erosion occurs whether air or water due to lack of vegetation and occurs during the rainy season during the flow of the valleys and floods

Occurs soil erosion area in two phases:

1-phase I: is the separation of the soil by rain falling and this of the water.

2-phase II: the transfer of soil particles are separated by water or wind on the surface and are divided into:

A-erosion class, covers has which is the removed of a thin layer of the soil surface and is usually not clearly marked.

B-erosion tabular occurs as a result of the ongoing focus of the movement of water on the surface in small channels. The erosion tabular is result the concentration of running water on the surface or in large assemblages of the hill sides.



Figure 6. Sea sand in desert south Libya

EROSION FACTORS

1-Human practices wrong:- rights have played and continue to play a key role in balancing prejudice and natural human practices to the eradication of natural vegetation and the accompanying collapse of soil structure and the deterioration of properties which was subject to erosion, water and air through :- A-fires: that causes the elimination of soil fertility and left at the mercy of water erosion and the elimination of the antenna as a result of vegetation cover, leading to conversion to the beads and sand flats.

B- Cutting down trees.

C- non-application of crop rotations in the region and the inability sedimentary pastoral grazing of natural reproduction.

D- Plowing season: displays the round to the deterioration of land to degradation as a result of the continuing and plowing under the harsh environmental conditions exposing it to erosion, especially during the wind.

E-Turned the area of pastoral and forests to agriculture land causing a decline in production of the land and desertification.

TYPES OF EROSION IN THE REGION:

1-Erosion geologist: a result weathering processes where matter is distributed origin to other places.

2-Aaccelerated erosion: it occurs between the compositions of good soil because of weathering.

3-Erosion antenna: the most dangerous types of erosion that has affected the region because of the number of activity wind occasionally cultivated land to turn into loose soil or carried over as a result of the impact of rainfall on vegetation cover lost ground and lost organic matter, became the soil in the form of dust makes it easier for wind transport and carry. the problem of erosion in the region due to the lack of vegetation which led to the loss of vast tracts of agricultural land and low way,due to the loss of topsoil nutritious foodstuffs .this is causing great of agricultural land depositing sodium water calcium and magnesium rations and concentration of carbonate and bicarbonate which has caused salinity and thus degradation of agricultural land and the occurrence of the phenomenon of desertification in the region .



Figure 7. Erosion of sand dunes south Libya

HUMIDITY IN THE REGION:

Humidity is the amount of water in the atmosphere and consists humidity due to the factor of evaporation and transpiration from the sea, soil and vegetation. Where there may transpiration and evaporation in the agricultural areas in the region because of drought and the inability of the soil to retain moisture due to drought and high temperatures .Libya with high humidity levels due to its proximity to the sea and the high temperature and also because of the ability of warm air to carry quantities of an environment of humidity.

REASONS HUMIDITY LEVELS IN THE REGION:

- 1-High temperatures which cause evaporation of the liquid.
- 2-wid and currents in the region that carry steam to the atmosphere.
- 3-the warm air in the region carry water in large quantities.
- 4-near the area of the sea increased from high levels of humidity in the region we not that rates in the region of high humidity in the summer because of warm air and has the ability to carry the water while the less moisture winter because of cold air and dry, cause of desertification in the region :-



Figure 8. Erosion soil of valley flooded west Libya

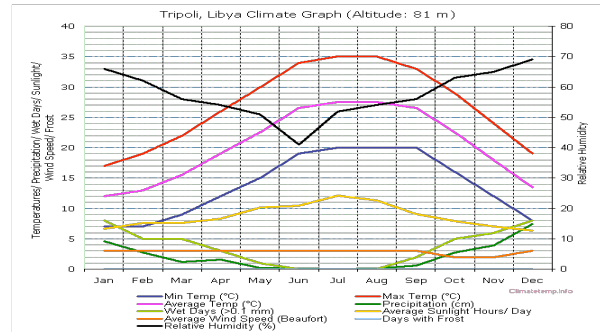


Figure 9. Climate changes of Libya

REASONS FOR THE PROBLEMS OF DESERTIFICATION IN THE REGION

*The First Natural Causes:

- 1-diffusion of sand dunes in the region come from wind or wind erosion, which destroys vegetation but will rob the soil surface of productive land, the establishment of this sand when the wind collision obstacle or a group of plants as the rocks around which leaving the area behind it and a smaller range before it reduces wind speed and accumulate some sand on the slip up diagonally in the direction of the wind-layered puzzles.

TYES OF SAND DUNES AREA:

- 1-sand offs, it is found in places where the lack of vegetation to note that they occur in the region dramatically and vast area are composed in a long string in the form of mounds separated by valleys in the direction perpendicular to the direction of wind movement .it is important that we can say-that the humidity of a winter and low be a great summer by the warm air in the region and increase transpiration and evaporation due to heat and dry sometimes. One of the main plant growth and presence of moisture from the soil must be saved by: the use of methods of land preparation in the field and even contribute to the transfer of larger quantities of water during the rainy seasons as well as water purification and intensification of surface vegetation moisture through the book cohesion soil particles by dense trees.



Figure 10. Erosion sand dunes centre Libya

SOIL SALINITY CAUSES OF THE REGION:

- 1-weathering factors in region by a strong heat and drought.

2-transfer salinity by the wind through the transfer of salt to the soil other than saline.

3-salinity transfer by capillarity of the surface water flowing.

4-by the time the fourth residue of the salt marshes of the waters of the waters of the valley during the seasons of rainfall and where a strong flow as the concentration of salinity in soil and increased salinity of the soil by mixing the soil water, high concentration passing on the salt flats causing most of the high salinity of the soil region which suffers from the concentration of calcium sulphate

THERE ARE REASONS FOR SALINIZATION OF THE REGION

1-the relative concentration of carbonate and bicarbonate in the salt marsh.

2-the relative concentration of sodium in irrigation water .

3-total concentration of salts dissolved in water flowing towards the soil and passed the flats



Figure 11. Transportation of sand by windy

DAMAGE CAUSED BY THE CONCENTRATION OF BICARBONATE AND CALCIUM SULFATE IN THE SOIL REGION:

1-reduce the abundance of water the plant and its ability to absorb the water.

2-presence of salts directly leads to poisoning of the plant.

3-anther problem of soil salinity of the study area originally to see the spread of the marshes and the erosion of water and air and lack of interaction (ph) due to lack of water and lack of vegetation.

4-lack of water resources and the low rate of rainfall.

*Second the Human causes:

1-cutting down trees as we know that the climate of the region located in the semi-desert by vast sand dunes and the vegetation covers less due to drought and lack of rain contributed to the lack of thick vegetation and the rule of the dry climate where the trees desert region and less of forests and natural reserves and the region is characterized by the presence of trees long desert drought-tolerant pastures in the form of a scattered and not of a high density and also salt – tolerant ,rate and lack of rain led to a lack of forests and trees long contributed to soil salinity in a few seedlings and fruit farms and has taken rights in the process of logging and grow towards agricultural land on

the covers of plant and raise the temperature of the atmosphere by burning trees and release CO₂ gas ,which raises the temperature a combustion process produces carbon and rise into the air in the form smoke where he works on the composition of the withdrawal of these fires and mound to develop the emerging trends and the strong convergence of low-level wind turbulence represent a microcosm of the hurricane –like storm and high-harvesting operations as well as lead to sand dune encroachment and the activity of local wind and the transfer of sand to agricultural land as well as the transfer of soil flats .the process of planting trees and plants create a balance of dynamic and live for many microorganisms that increase soil fertility thus creating a biological balance must be pointed out here the need to educate citizens to not to cut trees and try to contribute in increasing in the sea .

2-recess exploitation of agriculture land ,rights have played and still plays a key role in balancing the natural prejudice since his appearance on earth and practices exercised rights in the eradication of natural vegetation which accompanied the collapse of the structure of the soil and the deterioration of properties which cause them to drift as a result to the exploitation of poor agricultural land through the use of the plow and primitive roads in the processing of land and also the neglect of the land plowed for a long time ,exposing it to air erosion as well as seasonal tillage operations lead to degradation as a result of tillage and cannot be returned under the harsh environmental conditions which result in erosion and soil erosion including sand dunes .

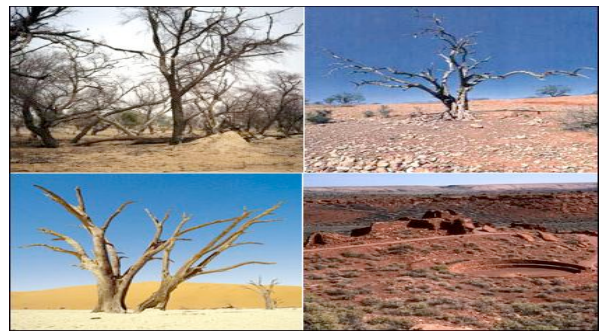


Figure 12. E .Desertification by human

ABUSIVE USE OF FARMLAND CAUSES OF DESERTIFICATION IS IN THE FOLLOWING:

1-was not suitable to use including the land

2-intensive agriculture is not sound

3-agriculture organization of the fragile land

4-inappropriate use of agricultural land by industrial projects and housing.

5-inappropriate use of rangelands and forests by removing them should be noted here that there should be strict laws are already applicable to every citizen to cut a tree plow pastures place to be punished.

3-overgrazing, we also know that the trees a short desert region of drought-tolerant and salinity is low density is a good place for camel grazing animals in the region and the lack of trees make the area a poor quality animal fodder and livestock grazing operations in the area due to the natural pastures that cannot meet the needs of animals from feed units of food, and overgrazing is not the application of pastoral session which led to the inability of the plant from reproducing naturally pastoral

,it is well known that the region characterized by the presence of the jungle and scattered desert plants which grow as a result of drought in the region are also infested shrubs long and close to the salt flats for it fasting the line stock animals cattle and camels but not many due to the lack of future plans for the development of grazing led to a decline in production due to low pressure and grazing durable throughout the year .here must consider the need to lock so that it grows well and trying to grow good pastures and forests ,establishment of wildlife for the growth of trees and the coexistence of animals in order to create the biological balance in the region, the establishment of water supply alskiet industrial and artificial lakes ,irrigation animals and trees in the region .

CONCLUSIONS AND RECOMMENDATIONS

THE FIRST RESULTS:

1-sand dune encroachment Libya regions prone to the encroachment of sand dunes due to lack of vegetation and the absence of a mechanism to install and see the solution in this issue:

- *planting trees and plants that demonstrate the sand dunes and contribute to the maintenance of land and increase the mineral materials as well as the aquaculture and animal breeding.
- *investment in the construction of the ground soil and through forestation and the establishment of good pastures and long – term investment return fast because it is aimed to build the soil and sand dunes fixation over a long period .
- *the establishment of mixed plantations and settlement which contributes to the creation of agricultural areas as well as the establishment of permanent vegetation and wildlife zoos and cultivation of huge trees.
- *trying to grow palm trees that can withstand drought through the establishment of the plastic cover on the horizon of the soil first to try keep for a long time until it feeds the plant .
- *try to study the movement of sand through remote sensing to establish a center in the region for the forest.
- *dune stabilization with asphalt , sprayed asphalt heated to the point 50c under pressure of 2.7 kg Lcm² in the form of spray rate of 2.5% hectares and planted trees before spraying (plastic) cover to protect it and use the sand coastal plastic as follows :
How to reduce windy erosion:-
 - 1-the establishment of windbreaks to reduce wind speed.
 - 2-the use of vertical farming
 - 3-try to retain vegetation reduce travel
 - 4-add organic matter to the soil so do not convert to the sand dunes.



Figure 14. good Framers in north Libya

THE SECOND RESULTS:

3-Improve the soil region,

A. How to deal with soil salinity region:-

- *soil of the region suffers from high salt due to the spread salt marshes.
- *plowing the ground and developed in a manner so as to not allow a good long-term tillage and must be grown quickly.
- *treatment of salt marshes by adding fertilizer and chemicals to increase the degree of interaction (ph) to 6.5 to 7 to become a good and the establishment of salt-tolerant trees on them .
- *try to wash the soil with irrigation water by salinity such as industrial water from the river by building canals and the establishment of desalination plants and try to treat and benefit from them .

*try to instill the marshes and irrigation surface water to wash the excess salt and to increase interaction and the establishment of berm around the marshes to reduce the spread the region.

B. How soil aeration region:

By keeping soil moisture is soil aeration by adding organic matter and tillage operations to strengthen the construction formation and disposal excess water by agricultural drainage and the use of plastic sheets rains the heat and evaporation of water reserves.



Figure 15. Maintenance of soil

METHODS FOR MAINTAINING MOISTURE IN THE REGION:-

- 1-maintenance of surface to increase the absorption of water and this operation is designed to hold the water the surface to increase the quantity of the soil to lose water
- 2-vegetation, it helps effectively prolong the survival of rain on the earth's surface and the alleviation of severe rain and thus force the amount of water equivalent to several times.

MATERIALS MOISTURE CONSERVATION AND SOIL AERATION:

- 1-article Hikas donal, a solution mixing surface soil in the depth of 1cm .a decrease from the evaporation of moisture and increase the activity of bacteria.

2-article alchorosol, mixed with water and soil are covered when sprayed layer plastic rubber and processes as well as the lights to make it easier to accept an adequate amount of rain.

CULTIVATION OF THE SOIL REGION REQUIRES THE FOLLOWING:

- 1-study of the preservation and maintenance of soil moisture.
- 2-elimination of weed
- 3-building dams to hold the water for irrigation of soil scientific methods
- 4-preventing soil erosion through the establishment of windbreaks.
- 5-the application of crop rotations and the creation of beam with trees
- 6-raise the interaction (ph) in the soil by adding salt minerals and fertilizers
- 7- To use the river water in the industrial laundry saline soils in the region

RECOMMENDATIONS

Cultivation area could be developed as follows:

- 1-improvement the genetic makeup of plants for the production of varieties with high.
- 2-cultivation of plants that can retain moisture for a long time.
- 3-trying to develop crops and increase production
- 4-improve the soil region by the addition of minerals which increase the interaction (ph)
- 5-mixed plantation establishment and the provision of adequate water them
- 6-take advantage of the great artificial river water through the construction of artificial channels into the region
- 7-the establishment of desalination plants.
- 8-the construction of dams for impounding the water of the valleys.

SOLUTION FOR THE REDUCTION OF DESERTIFICATION REGION:

- 1-planting of trees to prove sand dunes such as picking acacia pine juniper tree in large quantities and dense .
- 2-try planting palm tree and olive trees, through the establishment of plastic materials in the first horizon of the soil retain water for a long time addition of organic matter to install the humidity.
- 3-distribution plant trees on the citizens of the free to be planted.
- 4-the establishment of wildlife and pastoral land plots were fenced and protected allocated to the soil and the proliferation of wildlife and stability and the introduction of wildlife to it
- 5-the establishment of desalination plants and tries to dig wells and desalination the urgent use of the waters great man river to provide water in the region.
- 6-improve the soil by adding organic materials and planting trees to increase soil organic matter and reduce the proportion of the salts.
- 7-the establishment of plastic sheets to raise the temperature, moisture conservation and reduction of evaporation and finished products.
- 8-the construction of dams on the valleys and terraces the stands and try not to expose the soil to erosion.
- 9-the proper use of a land of agricultural and farming system and follow the guide the use of machinery to plow the land and

establishment of centers of awareness rationalization of the farmers.

- 10-planting trees and plants that retain moisture for a long time.
- 12-the establishment of wildlife and forests with vast areas of hundreds of hectares of sand dune fixation region deployed.
- 13-the establishment of parks to the soil from erosion and to create a biological balance
- 15- a center for remote sensing to analysis the climate conditions of the region and control the movement of sand dunes by the sensor .

CONCLUSION

We can say that desertification phenomenon of the Libya due to climate changes in the location of the region semi-dry desert, this sit has led to the creation of desert areas poor vegetation and animal and water due to lock of rain underground stockpiles and the proliferation of high sand dunes and salt from the soil through the proliferation of flats.

We conclude this paper with reference to need establish economic plans for the development of the region's economic and agricultural by improving climate conditions in the region such as the establishment of desalination of sea water and planting tree vast region and the establishment of nature reserves the land agriculture projects and to provision of water from the great man river, and desalination plants ,as well as improving the soil by adding minerals and fertilizers necessary marshes and forests which bear the salinity and soil moisture conservation through plastic materials ,important biological balance in the region by improving the conditions of the region climatically and biological for further development of the region and reducing the spread of deserts and sand dunes in the region by following the methods of sound development and future plans .

REFERENCES

- 1-water between the consideration and application, Dr Hassan slaoui
- 2-desertification in North Africa and Libya. Dr Ali Hassan
- 3-Libya soils. Dr.Khaled ben mahmoud Ramadan
- 4-Meterology. Dr.Mohammed ahmed alntah
- 5-Farmer Journal. No. 19. Year January 1979
- 6- Farmer Journal. No. 23. Year April 1983
- 7-Farmer Journal. No. 29. Year January 1993
- 5-Engineering Journal. No. 20-25. Year March 1989