NEAR EAST UNIVERSITY
INSTITUTE OF EDUCATIONAL SCIENCES
ENVIRONMENTAL EDUCATION AND MANAGEMENT

AWARENESS OF LIBYAN UNIVERSITY STUDENTS ON DESERTIFICATION OF ARABLE LAND IN LIBYA

MASTER THESIS

Abu Azoum ABDELRAHIM

Nicosia
May, 2019

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To the management of the Institute of Education of Sciences,

This study has been accepted as Master's Thesis by our jury on Environmental education and Administration Department.

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I approve that aforementioned signatures belong to the lecturers that are mentioned herein.

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DECLARATION

I hereby declare that all information in this document has been obtained and presented in accordance with the academic rules and ethical guidelines of the graduate school of educational science, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced all materials and results that are not original to the study.

Abu Azoum ABDELRAHIM
Environmental Education and Management

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Abu Azoum ABDELRAHIM

May, 2019

Nicosia

ABSTRACT

AWARENESS OF LIBYAN UNIVERSITY STUDENTS ON DESERTIFICATION OF ARABLE LAND IN LIBYA

Abu Azoum ABDELRAHIM

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Desertification is a severe ecological issue, including the dilapidation of land in parched, semi-arid, and dry sub-damp regions. It is caused basically by mankind activities and climatic varieties. the first step in solving any environmental problem is being aware that there is actually a problem. Hence, it is essential to ascertain the level of awareness of Libyan towards desert encroachment of arable land in Libya. 500 Tripoli university students were adopted for this study. Statistical package for social science was used for statistical analysis of data. Four variables were hypothesized for this study with 3 belonging to the independent variable. Frequency distributions, regression and coefficient of variance statistical analysis were used to determine the relationship between the independent variables and the dependent variable. From the data analysis, it was discovered that majority of the respondents that participated in the study are within the age group of 18-23 years. Also, male students participated in the study more than the female folks with percentage frequency distribution of 65.2 % and 35.8 % respectively. It was also discovered that majority of the participant are urban dwellers followed by rural dwellers. The frequency distribution did show that majority of participants are concerned about the environment and desert encroachment of arable lands in Libya. It then boils down to what is the level of awareness of desert encroachment of Libyan arable lands among the age group, gender groups, and residential location groups. For the research question 1, 2 and 3, the F-statistics is 2.597, 0.001 and 14.170 with significance value at 0.108, 0.000 and 0.000 respectively which indicates $P < 0.5$. Hence, the study affirms that there exist a relationship between awareness of desertification of Libyan arable lands and university student's age, gender and residential location.

Keywords: Desertification, environmental problem, desert encroachment

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ABBREVIATION CHART

ANOVA **:** Analysis of Variance.

EUROSEM : European Soil Erosion Model.

FAO : Food and Agricultural Organization of the United States.

GIS : Geographic Information System.

LADA : Land Degradation Assessment in Dry Lands.

MEDALUS : Mediterranean Desertification and Land Use.

RUSLE : Revised Universal Soil Loss Equation.

SPSS : Statistical Package for Social Science.

SWAT : Soil and Water Assessment Tool.

UNCED : United Nations Conference on Environment and Development.

UNEP : United Nations Environmental Program.

US : United States.

USLE : Universal Soil Loss Equation.

USLE : Universal Loss Equation.

WEPP : Water Erosion Prediction Project.

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CHAPTER I

INTRODUCTION

Desertification represents a serious environmental problem, including soil squandering within parched, semi-arid and dry sub-damp areas. It is mainly triggered by human activity and climate. As MEA (2005) stated, "desertification results from a mixture of factors that vary after a certain period of moment and vary by region." Libya faces a challenging problem of soil dilapidation and desertification due to its particular geological situation and its scandalous weather types. Projects for North Africa's environmental shift including Libya demonstrate increasingly alarming temperatures in counties which are efficiently concentrated on water and nutrition (IPCC 2007). In particular, global climate shift could further exacerbate the level of dryland squander and conceivable desertification (MEA, 2005).

Urbanization and loss of rich soils, overuse of water resources, overgrazing, soil destruction, and rapid use variability are key reasons for Libya's environmental problems. In the hot desert, despite the vast area of the country, a large proportion of the southern part of the world still holds 98% of its territory in the merit (Bin-Khayal, 1995). The primary exemption is a narrow coastal strip that extends across the Mediterranean Sea and some mountainous areas in the north and south, with sufficient rainfall for the growth of intrinsic vegetation and fruit-trees.

The desert problem could be addressed as the millennia advanced in parched and semi-dry regions. There has been a dependable connection between atmospheric and human activity differences over the lengthy term. While the population density of males and domesticated livestock stayed sufficiently small in a desertification area, the environmental outcomes of human activities were slightly immaterial or were believed to exist within an extremely restricted area.

The main emphasis on land accessibility, reducing soil decline and effective soil-water governance is crucial to areas where food safety and poverty alleviation are priorities, such as the North African area. The Food and Agriculture Organization of the USA (FAO) is presently sending the signal that it is encouraging arid and semi-arid nations to define causes for soil degradation (Nasr, 1999).

Libya has been subjected to human stress, especially in smaller areas, as a result of severe environmental problems, such as slumping and dropping the soil table, the disruption of sea water into the cool water areas, agricultural soil loss of wealth and poor effectiveness on many plants (Tantawi, 2005). The area has been under stress from Libyans, including the southern area. Each of these factors adds to the desertification problem in Libya. Desertification, property loss and drought are all about depriving people of meat and water and forcing millions of people to leave home. For food safety and the sustainability of livelihood, horticultural areas have an extremely important impact. The desertification of agricultural areas or the conversion from non-desert to forest, but also the exploitation of other wilderness uses such as managed pasture, conserving wildlife, restoration, eco-tourism and tourism, might also be forbidden (Portnov and Safriel, 2004). (Portnov and Safriel 2004).

The deterioration of agricultural biological structures due to desertification often put behind the ecosystem has ceased providing environmental facilities, and is even hard to recover in some instances. In Libya, horticultural methods are challenged primarily by the cruel land, climate circumstances and the water scheme that severely restrict crop output. The Libyan Government has also implemented numerous agricultural study operations to promote improved production in Libya. Specialists have also warned of the potential for further nutrient misfortunes of parched biological populations to lead to temperature increases and shifting rainfall models because of climate change and to render parched soils even more stale and helpless in order to support most plants (McCalley and Sparkle, 2009). Evaluation of the latest world desertion eminence have shown that exact difficult information, which would allow it to be accurately conveyed as to the level and percentage of desertification in various areas of the world, is still lacking (Mamdouh, 1999).

Individuals wherever need to understand how desertification of arable land is going to influence them and what they would be able to do to adapt, beginning with understanding what causes desertification and what impacts it has so as to find out answers and execute them (UNEP, 2003). Consequently, teaching people and making them mindful of this issue by incorporating desertification issues in instructive educational programs at each dimension in colleges in Libya, and by uncovering the misconception of students and people about desertification received from the mass media is of incredible significance. Today, ecological education of desertification in

college level is the best method to raise the ecological cognizance among countries (Taber and Taylor, 2009). College students' awareness of desertification impact, explicitly science students, is required to be one of the most elevated among students in the formal educational pyramid, and an imperative pointer to the knowledge of the overall public (AbuQamar et al., 2015).

In this literature, the need and importance of creating awareness of arable land desertification among Libyan students will be analyzed.

1.1 Aims and Objectives of the Study

The major aim of this research is to test the awareness of Libyan university student of the desertification of arable land in Libya.

The objectives are:

- To identify the factors causing desertification and make recommendations for actions to combat it.
- To analyze various ways to test the awareness of Libyan university students.
- To access the impact of not having awareness.
- To evaluate the effects of desertification.
- To depict the degree of desertification in Libya.

1.2Significance of the Study

In spite of the research dealing with Libyan university students' awareness of desertification, Libya seems to suffer from a gap in the efforts in this area. In the university curricular planning, desertification awareness is lacking. This study highlights the importance of creating awareness of desertification.

1.3 Problem Statement

Desert encroachment of arable lands in Libya is a very serious problem which threatens the environmental stability of Libya which is caused by both natural and human factors. Hence, this study will focus on the level of awareness of Libyan students of desert encroachment of Libyan arable lands.

1.3.1 Research Questions

- What are Libyan students' perceptionsof afforestation, as one of the causes of desertification?
- Is residential location one of the contributing factors to the level of awareness of desert encroachment of Libyan arable lands?
- Is there any correlation between gender factor and its correlation to desertification awareness level?

1.4 Limitations of the Study

Many Arab countries are affected by desertification. It is very vital to create awareness to the populace about the effect of desertification. However, this study is limited to creating desertification awareness in Libya. This is largely due to distance, financial and time constraints.

1.5 Assumptions

- The majority of Libyans including students have little or no knowledge about desertification.
- The majority of Libyans get their information on desertification issues through local sources.
- The Libyan government has a role to play in improving desertification awareness in Libya.
- Desertification is a major problem in Libya.

CHAPTER II

LITERATURE REVIEW

The review of this literature is focused on desertification in Libya. Basically, for this research, emphasis will be on awareness of desertification of arable land in Libya among university students.

2.1. A Brief Overview of Libya

Libya has a large area of around 1600,000 sq. km (Libya General Arranging Chamber 2003) of the north part of the African continent. Libya lies somewhere between 18 and 33 degrees north and 9 and 25 degrees west of latitude. Its climate is largely governed by Mediterranean and Sahara environment differentiations (Tantawi, 2005). The Mediterranean is seen as the Mediterranean coast with a 1900 km long coastline from east to west (Abu, 1995). As stated in the general population assessment (Libyan General Office of Data and Documentation, 2006) in 2006 the population of Libya is around 5,657,692 million.

It is hard to construct up much of the country in the vast area and in the troubling inherent setting. Water shortages and relentless climatic circumstances have hindered the expansion and development of human motion in these desert circumstances. The advanced and inhabited areas are thus small and limited in scrutiny with the nation's complete land. In the largest portion of the country, the desert environment is gaining, with only a narrow bay reaching throughout the Mediterranean which encompasses bay and northern hills, the Mediterranean being relatively cool and cloudy in summer with two temporal periods in summer and autumn (Mansour et al., 2011).

However, a big section of Libya meets a great deal of aridity and not much humidity. In summer, the temperature ranges from medium to low in winter. In early Spring in August the temperature gets the highest and in winter the lowest is registered. Libya has a humid environment and a few months a year rainfall is approximately restricted (October-Spring) (Emgaiili, 1995). Rainfall is the main component of humidity in Libya; it is, in any event, fugitive and limited (El-Tantawi, 2005).

In Libya, the development of horticulture is highly dependent on water scheme due to this sporadic layout of rainfall. Precipitation in Libya is extremely incompatible, thus limiting the dependence on agrarian manufacturing rainfall. For example, only 32% of all corn is generated under a rain-fed situation: 38% of barley 25% of date, 29% of cardiac muscles, 34% of veggies and 24% of olive (Fao 2005).

Climate circumstances in Libya, therefore, severely restrict agricultural development. In addition, in reaction to continued population growth and comparing increasing water requirements for residential, industrial as well as agricultural uses, Abufayeda and El Ghuelb (2001) announced that this shortfall will undoubtedly increase in the future. At current, the application for water exceeds the usual water resources limit, which makes it a vital condition for the integrated leadership of water resources with a specific attention to non-conditional water resources; desalination and reuse of waste water (Verhoeven &Whereida, 2007).

With the rapidly growing population and poor rainfall, the circumstances of water scarcity become increasingly difficult. The elevated temperatures and low rainfall introduced poor greenery, extended land disintegration and degradation throughout the area and placed the area at greatest risk of desertification. The annual evaporation degree is around 1700 mm near the oceans (Libyan General Planning Council, 2003) and 6000 mm in the main and southerly areas.

Groundwater is the main water source in Libya, accounting for more than 97% of all water consumed for various reasons. Groundwater is categorized as viable and inexhaustible groundwater in Libya. Safe water production has been estimated in 5 notable water bowls at an annual rate of 3,000 million cubic meters (Libyan General Planning Council, 2003). All things accomplished, Libya is considered to be one of the areas with poor inherent soil density due to reduced annual levels and sporadic rainfall dispersion. In addition, overgrazing in many areas of the country has also extended the path to the crush of inherent soil and soil degradation. The severity of the problem of desertification has inevitably increased (Saad et al., 2011).

2.2. Concepts and Definitions of Desertification

The term “desertification” has more than one hundred meanings, evidence of the intricacy of the problem (and the diversity of shareholders to whom it is pertinent) (Glantz, 1977). In overall, the common point on which all the definitions agree in that desertification is observed as an adverse ecological process.

As indicated by definition in convention to battle desertification (UNEP, 1994), desertification implies land dilapidation in parched, semi dry and dry sub muggy territories coming about because of different variables, including climatic variety and human activities. Furthermore, soil disintegration phenomena are the consequence of mind boggling collaboration amidnatural (e.g soil properties and atmosphere conditions) and human components (for example over-grazing, over-cultivation and deforestation) (EEA, 2005).

Another definition, according to Brandt et al, (2003), Tanrivermis (2003) and Salvati et al. (2008), is that land degradation implies decrease or transitory loss of the organic and financial efficiency of irrigated and non-irrigated agricultural land, fields, rangeland, and forests. It is trusted that land degradation results from different variables, including climatic dryness, poor soil and vegetation quality, and pressure due to horticulture strengthening, populace development, urban sprawl, and industrial concentration (Salvati and Zitti, 2005).

Dregne (1982) characterized desertification as the impoverishment of earthly biological communities under the effect of man. It is the procedure of decay in these environments that could be estimated by diminished profitability of desirable plants, unwanted changes in the biomass and the diversity of the micro and macrofauna and flora, accelerated soil deterioration, and increased hazards for human occupancy.

2.3. Review of Desertification

Mainly human activities and climate varieties cause desertification. This is because dryland biological systems are incredibly helpless against abuse and inadequate land use, which would all undermine land waste and efficiency. Dryland-biodiversity systems are increasing pressure to give administrations, for example for human and domesticated animals food, scrounge, fuel, construction

materials and water, irrigation, and health. A mixture of human components and climate elements is credited with this expansion. These are still not limited to population pressure, financial and strategic factors, problems with globalization and soil use, and climatic procedures, droughts and anticipated decreases in accessibility of freshwater due to global warming (Williams & Agricultural, 2015).

Desertification includes degradation of soil in arid, semi-arid, dry areas of sub humidity. This is mainly due to the activities of people and the climate. The fact that the development of existing deserts does not reflect desertification is often misunderstood.This occurs due to the bio-deficiency of the dryland. Overgrazing, over-growing, expanded fires, water depletion, deforestation, overdrawal of soil water, increased salt and global environmental change are essential explanations behind desertification. More than 1/3 of the world territory is spread by these desertification masses. This dry land is extremely vulnerable to excessive abuse and unreasonable use of land. The country's wealth could all be undermined by dispositions, political insecurity, deforestation, overgrazing and poor irrigation. More than 250 million people are affected by desertification specifically. Furthermore, in over one hundred countries, some thousands (or one billion) people are at risk. These people include a significant number of the most affluent, the least developed, and the political powerless inhabitants of the world. (Source: Convention against Desertification by the United Nations: An Explanatory Leaflet).

The loss of organic or financial productivity and intricacy in croplands, fields and forests will also include desertification. Over-development, over-grazing, deforestation and poor water system practices are the commonly cited types of unsustainable land use. 70% or somewhere within 3,600 million hectares of the dry land in the world (barring hyper-parched deserts) is degraded. While drought is regularly linked to land squandering, it is an innate wonder when precipitation for a while is totally below traditional recorded dimensions.

The World Bank assesses that in the desertification-influenced areas an annual wages inevitable at world level is up to 42 billion dollars per year while the annual costs of fighting the slackening of land cost only 2.4 billion dollars each year. Desertification has enormous monetary results. Taking all things together, more than 110 countries have desertification in drought. Desertification is mostly damaged in

Africa, Asia and Latin America. Latin America and the Caribbean, although better known for their tropical forests, are in fact about a quarter of a desert and drylands. In many of these dry areas, land degradation and pressure on land assets are the cause of soil corruption (Williams & Agricultural, 2015).

The International Panel on Climatic Change's latest report shows that tropical deforestation is responsible for approximately 20% of earth's gaseous emissions. The end of this harmful pattern is currently seen as the most effective and productive approach in a viable way against global temperature change, its second biggest cause (Nicholas Stern's Report on Financial Environmental Change–October 2006), but it also protects the rich and essential biodiversity in these forests.

Desertification has been characterized as land dilapidation in the areas of the dry and semi-dry and sub-damp, due to the various variables, including climate varieties and the activities of humans, by a UN Conference on Environment and Development in 2007. The focus of the meeting was on how the prolong on a sustainable improvement worldwide can be relieved from the natural context. These regions face real physical limitations linked to lack of water assets, low plant profitability and the general impotence of natural framework and capacity. Every single creature and plant species is a model for modification and obstruction, but the pressure exerted by the rapidly developing populations and their domesticated animals effectively exasperated biological partners and formation. In many places around the world and in creating nations specifically (Williams & Agricultural, 2015), desertification has turned into a longstanding and gradually extreme issue.

Dismantling of soils is the most immediate effect of deforestation. An estimated 15,000 sections of the land (61 km 2), including dams, water system frameworks, streets, the beachfront and the marine biological communities are washed away each year with erosion. Equally, soil decay reduces land efficiency, exacerbates dry spells and ultimately causes desertification, which increases the weight of other land and trees.

Land waste and desertification expenses mostly include the damage to streams, canals, dams and repositories due to the dregs. Normally, these are harder to investigate and the rancher cannot specifically feel a significant number of the effects.

Reynolds and Stafford-Smith (2004) recommend that a rating be made between local and nearby expenses. Supervisors may not be allowed to suffer from gully erosion in neighborhood land, but expanded sedimentation could lead to real costs for decreases in power age for the administrator of the hydroelectric dam downstream. These problems confuse moderation in desertification.

According to the United Nations Environment Program (UNEP), 35% of the world's territory–the consolidated area around North and South America–and the employment of the 850 million people that occupy the land are at risk of desertification.Currently, 21 million hectares are decreased every year to a state of closing or complete uselessness. Projections to 2000 show that this disaster will happen if countries neglect to undertake therapeutic activities (World Bank, 1992).

2.4 Causes and Consequences of Desertification

In ongoing decades, Libya has seen huge improvement in different fields, especially in the parts of horticulture and industry. Be that as it may, such improvement has put negative impacts on nearby biological systems, particularly in touchy and delicate regions because of progress underway examples, and the need to give nourishment necessities to the developing populace. Subsequently,this lead to the increase of pressure on officially restricted normal assets, and in this way raising area corruption and desertification issues. There are a few characteristic and human factors that reason land debasement in Libya (Ben-Mahmoud et al., 2003).

The normal elements mainly include atmospheric, wind and temperature changes. In the light of changes in external and internal impacts in the air framework (Emgaili, 1993), the climate is different starting with a setting then the next. Due to geological time, the climate of the African landmass has varied enormously, with wet and dry ages flourishing. Dry ages have led the Sahara to rise, and the current land climate is a continuation of the dry climate begun since the Sahara, with a global drought-driven inclination in recent years. Continued wind and erosion of water are therefore side effects in Libya on land settlement and desertification (Emgaili, 2003).

Although climate elements play a key role in the spread of the wonders of desertification, human action has a bearing on natural assets and people asconsequences of dry season. Many human components are added to weaken

ecological circumstances and the impact of desertification in Libya. The increasing population pressure on innate properties (e.g. water, soil, vegetation), poor administration and abused by elements or people of innate property, mainly led to desertification. Anthropogenic problems leading to the decline of soil and vegetation in Libya include over-exploitation and evacuation of natural vegetation in negligible regions (v) soil-abuse on arable land and urbanization (Libya General Arranging Board, 2003).

A number of adverse environmental, financial and social effects are caused by desertification directly or indirectly (Nahal 1987). Therefore, the output of inborn pastures, forests and vegetable groves declines. In times of progressive famine, it is seen that the grain generation in the dry and minimal zones of the Middle East is declining significantly. In this case, we are watching the situation decline. Furthermore, a decreased production of animal results in weakening of the peaceful situation and thereby reduces the output of meat and milk. The decrease in soil fertility, changes in the physical and synthetic properties of desertification, and water erosion is combined with indefensible effect. This could lead to a decrease in the amount of horticultural assets and to a decrease in the arable land area, which has negative financial results. The forestry and inorganic pasture due to deforestation leads to endless growth in the number of animals beyond the conveyor limit leading to creature food being brought in from abroad and to severe monetary misfortunes. This affects domestic pay (Nahal, 1987).

In addition, desertification has many natural repercussions. The decrease in biodiversity as it adds to the devastation of the living areas of animals and plants and microbes is a noteworthy result of both local and global desertification (Abahussain et al., 2002). Biodiversity ill-fated animals and plant sorts and species in a delicate environment are also planned to stimulate hereditary erosion. There's no exclusion in Libya.

The desertification results are generally supported by the poorest and helpless people in the world. Desertification adds to food insecurity, shortages of water, monetary difficulty and social and political turmoil.

Loss of topsoil leads to a decline in nutrition. Reduced food production leads to hunger, poverty and immigration.

The continued appetite, misery, and migration is an impediment to achieving the Millennium Goal, with extraordinary hunger being destroyed in the first place.

Water loss without trees or vegetation causes distraction of soil by rare flashes of flooding. The water on the surface is then quickly lost as the waterways and lakes disappear. The evaporation in lakes, rivers and reservoirs, combining with sedimentation, means water loss as well as loss of land and displacement.

Economic loss at global level is estimated to be roughly US$ 42 billion each year, foreseen annually in areas quickly affected by desertification.

Loss of cultural identity and difficult immigrant lives undermine social security. In Africa, many people have been internally displaced or forced to move to various countries. The Californian immigrants experienced similar situations in the 1930s (Prince &Exupery, 2019).

2.5. Process of Land Degradation and Desertification

Desertification sets in when people aggravate innate equilibria by over-abusing innate assets. Human activities are to a great extent purposeful and, however, frequently dependent on numbness, are for the most part determined by rising need as well as greed. Overexploitation of innate assets, for example, unsuitable agricultural practices and overgrazing are believed to spur dilapidation of land that identifies with degeneration of soil and vegetation cover (Rapp 1974). There are numerous procedures of land dilapidation.As indicated by FAO (1984), the principle forms are soil degradation, soil erosion and vegetation cover degradation.

This regularly expands soil erosion, soil depth decrease, impeded lushness of the soil, and loss of natural matter, and energizes lessened land profitability and biodiversity and expanded desertification. The soil erosion forms are a noteworthy worldwide ecological issue and are in charge of land dilapidation. In semi-humid and semi-parched regions, water erosion and the related loss of soil supplements are the fundamental issues. In dry terrains (semi-dry and arid regions), wind, erosion and salinization are the prevailing issues. In the Mediterranean districts, water erosion as

well asagricultural bungling are the significant reasons for land dilapidation. Water erosion is specifically constrained by various elements that interface with each other: climate, vegetation, soil properties and geography. In semi-arid- grounds, water erosion is a noteworthy wellspring of soil dilapidation, joined with vegetation cover demolition, it adds to an expansion in land dilapidation dangers. According toKoohafkan and Ponce-Hemandez (2004), the procedures are entangled and comprising those emerging from human activities, soil erosion, decay of the physical, chemical and organic and long -haul loss of innate vegetation. These conditions happen together with social, political, monetary, and cultural components to influence land adversely (Abdalrahman, 2013).

2.6 Desertification Detection and Alleviation

Due to the severe results of desertification, there should be a feeling of criticalness in the endeavors to fight it. The initial step is by observing which should be possible by estimating land dilapidation and desertification processes. The current standard techniques for undertaking such estimations are still especially flawed and are not financially plausible. These ordinary techniques have customarily been short of institutionalization due to the scope of criteria and markers. The different information sources accessible utilizing remote sensing offer the likelihood of increasing natural information over both extensive zones and moderately prolonged stretch of time periods. Though nobody could affirm that remote sensing could substitute conventional sources of information for stock and checking, there is, notwithstanding, an undeniable role that it will play in surveying and observing desertification. It has been shown that satellite-based and airborne remote detecting and geographic data frameworks offer a significant potential in evaluating and observing desertification in the Middle Easterner world (Shariff, 2016).

In spite of the mindfulness on desertification, the Middle Easterner nations still can't seem to gauge the dimension of danger presented by different natural, financial, social, cultural, political and security results of this issue. Methods to fight desertification in the Arab countries change as indicated by the diverse reasons for desertification as the speed activities and the vision to handle this issue. In any case, they all look to reduce the circumstance of drought and desertification by taking soundmeasures in accordance with the national plans of every nation. Since the

Nairobi Conference in 1977, most Arab nations endeavored to create methodologies to fight desertification and execute the proposals and choices radiating from the conference and have created national plans on fighting desertification temporarily. The Middle East countries have made a few endeavors to make joined structures and establishments to encourage collaboration to defeat the issue of desertification and to repair the harm it caused. In addition, some provincial activities were built up including the Green line projected to the nations of North Africa, the undertaking of Green line in the Eastern Middle East countries and the task of Green line to the Arabian Peninsula. The principle point was to expand the green regions so as to stop sand infringement and to ensure the horticultural land. At the national dimension, a large group of tasks identifying recovery of land, pasture improvement, irrigation, extension of forestation and sand ridge adjustment notwithstanding different methods were actualized in all the Arabian nations (Shariff, 2016).

2.7 Assessment of Land Degradation and Desertification

There are a wide range of methodologies for surveying land dilapidation as well as desertification yet there is no single best worldwide technique since they are chiefly founded on master assessment. By and by, field perceptions and estimations, efficiency decreases, estimations of land users, remote sensing and modeling are basic methodologies for surveying land dilapidation. Land debasement evaluation is perplexing as many kinds of dilapidation could happen in one spot, subsequentlyutilizing similar techniques, devices and methodologies for surveying diverse sorts of dilapidation in one spot is troublesome. A few strategies have been created and defended to accumulate.However, much valuable information as could be expected dependent on its investigation zone and information accessibility.

Observing the areas and dispersions of land-cover changes is imperative for evaluation of dilapidation and building up linkages amidpolicy decisions, administrative activities and ensuing land use activities. Utilizing satellite information in variation identification gives a suitable and steady evaluation of variations in land-use trends over various size scales (Prakash and Gupta, 1998).

A unified land coverordering scheme has been built up for grouping of pictures (Zhou et al., 2008), and a few examinations have been utilized; ThematicMapper (TM)

to arrange information (Li et al., 2004). A spatial tenacity (Landsat-TM) at a size of 20 to 30 m will be satisfactory for land use order (Lilies and Kiefer, 1994).

This investigation applies methods to the examination of region utilizing Landsat TM and Enhanced Thematic Mapper plus (ETM+) satellite information to distinguish and arrange land cover (for example vegetation, urban regions, bushes, uncovered soil, rain fed and watered land) over a 24-year time frame at 8-year intervals from 1984 to 2008. This enablesvariations in land cover to be recognized and the accumulating of long span land coverantiquities (Duncan et al., 2010).

Managed cataloging and post catalogindetection systems connected to Landsat pictures with visual translation give a general thought regarding the structures of land covervariations (Shalaby and Tateishi, 2007). On account of confinements, for example, the temporal resolution of the Landsat TM picture and picture cataloging methods, visual elucidation is an effective strategy for arranging intricate and heterogeneous scenes. Kappa factual examination and error matrices could be utilized to test the precision of the order of the land spread guide with ground truth information (Guler et al., 2007).

Utilization of remote detecting could produce a land cover guide which gives numerous advantages to follow land cover variations. These provide information about any area at various periods of time, making it conceivable to screen and record the past or current status of a specific locale (Bharti et al., 2011). Utmost consideration has been givento change location for understanding the foundations of positive and negative effects land cover (Pungetti, 1995). Variation detection is the most usually utilized quantitative technique to recognize land cover and land use variations in an investigation zone (Wu and Zhang, 2012). Remote detecting can delineate numerous territories under some particular desertification process; evaluation and checking of vegetation dilapidation and erosion (Ostir et al., 2003). It was appeared in specific cases that land cover examination permits distinguishing proof of explicit highlights of desertification (FAO 2005).Remote detecting is the best and proficient instrument to survey temporal variations even in little scales. However, it will never permit perception of or recognize the causes, levels and kinds of dilapidation (Lantieri 2003).

During the 1980s, Geographic Information Systems (GIS) began to be presented in land use planning divisions (Eastman 1999). When utilizing GIS, a specialist for the most part assembles an assortment of data on discrete subjects, for example, vegetation, soils, climate, geography and topography that is composed in individual layers. Point by point learning of the landscape is needed when arranging such innateaspects. These different layers of data would then be able to be laid more than each other at any single position or region that is of intrigue. GIS is along these lines utilized for putting away and recovering the current database data, breaking down and coordinating it and after that creating interpretative maps dependent on information qualities (Burrough 1991).

The information control and examination work decide on the data that could be produced by the GIS (Aronoff 1991). Control and examination allude to the recovery of information from the geological database and the making of new data by consolidating this information.The investigation and control are done through GIS directions and capacities (Tomlin and Johnston 1988). Cartographic displaying has been effectively connected in fields, for example, ecological planning, land assessment, and forestmanagement (Burrough and McDonnell 1998).

By and large, the land cover and land use maps that are a piece of the GIS database are the consequences of directed cataloging of remotely detected information and precision evaluation, making utilization of GIS maps.GIS is the best device for dealing with this mind- boggling wonder as it is a mapping framework with the capacity to digitize maps, overlay spatial information and show the results as maps. Inside GIS, seeing and overseeing land cover segments, for example, regular vegetation and soil types just as atmosphere and geology information is conceivable and all such information could be broken down inside one structure. Application of a fitting hypothetical model might help distinguish the causes of land debasement, which is the initial move towards its decrease. Land dilapidation has been evaluated utilizing various diverse procedures, for example, the fundamental rule of Global Assessment of Soil Degradation (GLASOD), which gives data about soil and land debasement and increase mindfulness for the need of soil and vegetation upkeep (Bridges and Oldeman 1999). GLASOD has been connected on an overall scale and its evaluation gives information on erosion power and conveyance over the world just as the sorts and level of degradation (Bridges and Oldeman 1999). The maps of Oldeman

et al. (1990) distinguished zones with a specific severity of erosionrisk, regardless of the makes that drove such erosion. In any case, no remote detecting or field estimations have been incorporated, it depended on expert suppositions (Jones et al. 2003) and on reactions to a questionnaire sent to perceived specialists around the globe. A portion of the perceived specialists did not answer the surveys at all and some addressed couple of parts just, therefore, outcomes delivered from such kinds of models are not precise, mind boggling and difficult to use for local examination (Jones et al. 2003).

Land DegradationAssessment in Drylands (LADA) methodology considers biophysical factors and social-economic driving forces. It depends on the DPSIR structure where D demonstrates the main impetuses, P the pressures, S the state of land and its versatility, I the effects of the expanded or diminished pressures, and R the reactions by the land clients to discharge or lessen the pressure on the land. The project is expected to make a creative nonexclusive commitment to procedures and checking frameworks for land debasement in Argentina, China, Cuba, Senegal, South Africa and Tunisia (Kapalanga, 2008). Since LADA is worried about soils for horticultural purposes it incorporates land client opinion, field criteria, field checking and profitability changes (FAO, 2005). Conversely, remote detecting systems ought to be utilized to watch pointers, for example, land cover and land use variation, vegetation clearing and fragmentation (Burning and Lane, 2003).

To evaluate soil erosion and to create ideal soil erosion the executive's plans, numerous erosion models, for example, Universal Soil Loss Equation (USLE) (Wischmeier and Smith, 1978), Water Erosion Prediction Project (WEPP), Soil and Water Assessment Tool (SWAT), and European Soil Erosion Model (EUROSEM) have been created. Among these models, the USLE has remained the most pragmatic technique of assessing soil erosionprospective in the fields and to evaluate the impacts of various control executives' practices on soil disintegration for almost 40 years (Kinnell, 2003) while different procedure based on erosion models have serious information and calculation prerequisites. Although initially created as an empirical model, updates of the USLE could prompt an applied model that gives an ability to broaden well past the conditions experienced in the related information collection (Kinnell 2007).

Numerous refinements and corrections have been made to deliver the Revised Universal Soil Loss Equation (RUSLE), yet it overrates soil erosion if the surface of soil has a high ability to penetrate precipitation.This is because of the absence of a spillover factor in the RUSLE (Risse et al. 1993). The level of overestimation falls as the capacity of the soil to produce surface overflow increments. Various models have been created to endeavor to beat error in valuation of soil erosion by considering brief timespans instead of over a year (Kinnell (2003), for example, the MUSLE (Williams 1976) which performed better than USLE in evaluation as well as expectation of soil loss (Arnold and Allen 1996). Notwithstanding, MUSLE gauges the general loss of soil amid a solitary precipitation occasion thus would needrainfall intensities from various measures spread over the examination area, which are not accessible here thus MUSLE isn't proper for this investigation. Land dilapidation could likewise be assessed through forecast of the measure of soil erosion utilizing USLE approach (Htun et al. 2008).

Fitting and steady quantitative systems for soil erosionevaluation and expectation could be given by USLE (Wang et al. 2009). USLE is especially suitable in light of the fact that it might empower a linkage to be built up amid land cover, topography, soil qualities and farming practice and soil loss, especially through water erosion. USLE has been generally used to give a quantitative and reliable methodology for assessing soil loss in sloping regions. USLE has had a very significant effect on how study on the preservation of soil is directed over the entire globe. It can predict the conveyance of soil erosion spatial patterns and assess its causes (Wang et al. 2012a). The USLE holds numerous advantages in view of an apparent simplicity of parameterization use and prompts an increasingly reasonable methodology that gives an adaptable limit past the experienced conditions in the related informational index (Kinnell 2007). In spite of the fact that USLE has met with practical accomplishment as support for the decrease of soil erosion, it cannot reenact soil erosion as this is a dynamic procedure dissipated through watersheds and time evolving.

Land desertification could likewise be assessed utilizing the Mediterranean Desertification and Land Use (MEDALUS) strategy, which recognizes regions that are undermined by desertification. MEDALUS has been utilized in Greece (Giordano et al., 2002), Italy (Basso et al., 2012), Portugal, and numerous different nations, for

example, Egypt and Algeria (Benabderrahmane and Chenchouni, 2010). MEDALUS has been utilized to survey and study the causes and reactions that add to affectability to desertification of every essential land unit representing anEnvironmental Sensitive Area (ESA) and the interrelationship amid land uses, land cover variation and land dilapidation. With regards to the MEDALUS, a distinction is made amid the procedures of desertification in European Mediterranean situations and those which happen in some much dryer districts. Although the two models have been utilized in the Northern Mediterranean zone, neither has recently been connected in any district of Libya.

2.8 Combating Desertification

Since the mid-1960s, the most ideal way of fighting desertification in Libya has been genuine action (Bin Mahmoud 2000). These measures represent a component of a wide-ranging approach within the structure of the National Farming Arrangement that takes account of the goals of progress in the neighborhood and the cruel natural conditions in the country. These measures include controlling sand ridges, founding of windbreaks, reforestation of the neglected timberland land, creating porches that combat the breakdown of the soil, safeguarding runoff in rural incline, and pursuing a rare horticultural cycle to maintain soil fertility, especially in the grain areas, as well as assuring and improving.

Literature says that despite the achievements of certain efforts to achieve the ideal goals, others did not achieve the same achievement due to lack of relevant legislation and legislation relating to earth insurance (Libyan Bureau of Urban Arrangement, 2005).

However, better practices by managers in land use could slow down the process of desertification. In the previous four decades, Libya has taken numerous measures and actions to reduce desertification. In many regions (that is forest, pastures, fixing of sand dune, preserving soil and water, protecting against erosion and agronomy incorporated), significant desertification systems can be described by the government in implementing the various activities. Libya has taken great account of improving and preserving water resources through a strict short-term and long-term policy to maintain a genuine water supply channel. There are many different activities that contribute tothe protection of land and maintain its soil strength, for example

following the strategy of crop rotation to maintain its soil power, in particular for grain cultivation development areas; reforestation of waste land; securing and improving innate pastures; creating financial non-agronomic activities, especially in terrestrial areas.

Libya has been extremely careful with improving and promoting pasture and establishing pastoral activities that rely on logical techniques to safeguard the environmental balance. A number of projects have been undertaken to control pasture and to restore degraded land. Significant efforts are being carried out in order to maintain regular environmental balance in reforestation lands compromised by erosion and desert infringement. They include the area and soil security and the provision of part of what forests require to fight against unfair trees cuts and forestry to improve their efficiency, the establishment of botanical centers, support for timber planting, wind screening and defense barriers as well as addressing the needs of public activity. Their activities include securing of land and ground. Moreover, one of the worthwhile initiatives is to define access rights and to keep certain species cut, to protect them from insect damage and the organization of pasture in inborn forests. The country has witnessed tree planting campaigns since the 1990s, involving the most deserted and debase led land for balancing the natural environment, establishing land restoration for national parks and reserves, in order to preserve biodiversity and ensure that unusual creatures and plants are not destroyed. for the reforestation of debased and deforested lands to pay for misfortunes The Board's approaches are distressed by overgrazing, over-exploitation of water and land, over-development of peripheral lands, deforestation and the use of inappropriate technologies (Mansour et al., 2011).

The human community has a variety of choices on the nature of our lives and the state of the world. Each of these choices will determine what kind of world our children and grandchildren are living in. UN Secretary-General Kofi Annan. Desertification measures should be aimed at people and society. Here are ways of achieving a more sustainable land use. The problem will become more obvious, indigenous trees and trees will be planted, sustainable agriculture will continue, renewable energy will be used, people will be mobilized and involved, women empowered and rural markets will be developed.

2.8.1 Desertification in Libya

On 17 June 1994, the Convention against Desertification was adopted and on 17 June 1994, "World Day to Battle Desertification and Famine," is observed every year. The reason for the World Day is to raise awareness of desertification and to encourage activities which will heal a portion of desertification results and prevent further soil and water depletion. The desertification agreement was highlighted at the 2002 World Summit on Sustainable Advancement as a vital tool for the abolition of destitution in the drylands.

The squandering of drylands blocks efforts to overcome misery and hunger and will hinder the achievement of the Millennium Development Goals if they do not change. A concern about desertification was made in 2006 as the International Year of Desertification (IYDD). In this effort to increase awareness about desertification all nations were encouraged to embrace exceptional activities to stamp the year (Prince &Exupery, 2019).

University students in Libya need to be aware of desertification and its consequences and how to mitigate the impact of desertification. Therefore, raising awareness by creating a curriculum in the school will really help them to be informed of what desertification can lead to in Libya.

8.2 Planting and Protecting Indigenous Trees and Shrubs

The benefits of trees are enormous in anticipation of desertification or restoration of degraded land. The initial phase in stopping desertification is typically planting trees to:

- Stabilize the soil
- Shield it from extreme sunlight, strong brisknesses and sandeleaning
- Block precipitation to shield the soil from splash erosion
- Preserve moisturization and help to recycle local water from rainfall through the cupboard and is consumed by humus
- Stock up soil nutrients
- Absorb carbon dioxide

The over-abuse of indigenous trees and the introduction of non-local species

could prompt environmental disturbance.

It is important to recover imperiled native species. The foundation of temporary insertions is a technique for enabling the innate regeneration. This arrangement is essential in line with the customer's wishes. The seed banks, places where seed is put away for temporary use to grow or for long-term conservation, are another strategy. When efforts were made to introduce exotic species to Tunisia for the refining of tainted land, the indigenous pastoral plants were not given an effective consideration. In 1986, the Arid Region Institute of Tunisia produced a gene bank of indigenous dry and desert rangeland plant species. This gene bank is included in national desertification and national biodiversity programs (Prince &Exupery 2019).

2.8.2.1 Community Forests

The goal of the community's forestry industry is to address the issues of people in such a way that forest products are reasonably accessible. Local people are entitled to use and manage forests for their own benefit. The municipality project could also include the planting and planting of land, schools, medical clinics, shrines, mosques, hallowed regions, parks and rivers. Schools association helps to increase tree planting awareness. Trees and shrubbery also create food and high-estate forest products for local communities while playing an important role in the soil improvement, watershed securing, (Prince & Exupery 2019).

2.8.3 Developing Sustainable Agricultural Practices

Ranchers live in agreement with their environment by expanding the number of trees in rural areas. The land is benefiting from the presence of ranchers and the ranchers benefit from their own desertification control. Agroforestry is a training course that includes valuable, multifunctional trees and shrubs into the cultivation frameworks. Agroforestry frameworks include cultivation of alleys, windbreaks, riparian coats and forestry. The trees cover land and domesticated animals, provide habitat for wildlife and control the erosion of soil. Leguminous species increase the fertility of the soil, fruit trees feed, trees like Acacia Senegal provide gum and prescription, and various satisfactory trees give fodder. Bolstered or perused by animals should provide protein, nutrients and components of minerals that are often affected by grassland pastures in the dry season. The proposed species, which are

extremely dry, have protein-rich units that provide fodder for large animals. Bonding, contour binding and terracing are erosion-stopping systems. With the bonding matrices of earth mounds, areas of the earth are enclosed to prevent waste and allow rainwater to penetrate to recharge the water table and to preserve the surface. For example; the use of fertilizers and leguminous fruit rotation in order to improve soil fertility must be complemented by various methodologies, for example physical structures such as bonds. Terracing, the development of gully checks and forestry support for soil and water conservation work in Eritrea (Prince &Exupery 2019) are concerned.

2.8.4 Utilizing Alternative Sources of Energy

The sustainable use of vigor means ensuring that the present and future generations receive sufficient vitality while at the same time protecting the earth. This should be possible through the use of renewable energy sources and a more vigorous use. Prosopsis is an innate fuelwood in dry and semi-dry areas with rapidly growing drought and salt-tolerant. In view of its high warmth, the wood has been designated "wood anthracite." By advancing replacement life sources and by improving the productivity of the current use of vitality the pressure on innate vegetation cover could be reduced. Moderate wood enhanced ovens are one way of providing a safe and lively environment. The use of fuel saving stoves, called mogogos, has been advanced in Eritrea Concern (Prince & Exupery, 2019).

2.8.5 Mobilizing and Involving People

The convention will focus on people who suffer from the desertification effects and who best understand the ecosystems in which they live, must choose how to restore dented land and counteract further degradation. The Convention requires the construction of associations with influenced populations and their actors, the national government and bilateral and multilateral donors. The motivation behind the associations is to establish national programs of action to deal with desertification. Over the years, local populations in Africa have developed strategies for monitoring and anticipation of soil and wetland, domesticated plants and animals. Without respecting the balance of the biological ecosystems of drylands, specialized developments are regularly derived from wetter environments. There is a wide range

of biophysical, financial and social conditions in drylands. Therefore, for the distinctive conditions, different sets of solutions to fight desertification will be needed. The action plans should provide for the use of existing local information (Prince & Exupery, 2019).

2.8.6 Empowering Women

Millennium Development Goals 3 aim at promoting equality between men and women and empowering them. In order to achieve the objective, the system in Ireland is focused on. The Irish guide currently considers it a central necessity for all advancement mediations to advance sexual orientation equity. Women are the important food, fuel and water suppliers for their families in livelihood economies, but their entry into land is declining. The best way of building food security, reducing population development and calming nature pressure lies in putting resources into women. Women's empowerment is essential for sustainable development of innate assets. Endeavor is expected to prepare more women in forestry and innate asset exercises to upgrade their cooperation from local to international policy in every respect (Prince & Exupery, 2019).

2.8.7 Development of Local Crops and Rural Markets

This Convention proposes the development and improvement of rural markets by dry resilient and salt-resistant crops. Consideration of whether or not they were domesticated should be paid to neighborhood plants. A large range of plants suitable for local conditions must be cultivated. Both solid soils and sustainability are guaranteed by organic diversity of crops. Natural development should also be energetic, since this framework reduces damage to the land and mitigates some of the adverse effects of monoculture. The neighborhood exchanges and the production of nearby products, both agricultural and non-agronomical, are expected to support close markets. The emphasis on exports of non-refined goods has a negative impact on the neighborhood economies. If this situation could change more wages could be earned without so much damage to soil. Access to companies was increased through arrangements and recovery of extension and feeder roads (Prince &Exupery 2019), a feature of the Concerns Livelihoods programs in both the Democratic Republic of Congo and Sierra Leone.

2.8.8 Enacting Legislative Acts to Combat Desertification

Libya has updated a few laws with a range of additional and supplementary measures to monitor, protect and limit urban improvement to the detriment of farmlands and limit the weakening of water assets just like the fitting system for efforts to combat desertification and to fulfill the objectives and needs of their farm. In any case, declarations of these laws, administrative permits, guidelines and checks will be insufficient in themselves, because their implementation, control and development must also be regulated by them. The different investigations, insurance and supervision agencies need guidance on the hugeness and extent of the distinguishing impacts and causes of desertification, as well as their likely role in alleviating the extreme restrictions and the following pressures. There is, therefore, a need for expectations of rare dry spells and deficiencies in the inherent assets of affected regions (National Desertification Committee, 2002).

The following are the following Legislative Decision No. 33 of every1970, and No. 46 of 1975, in order to shield horticultural lands from settlement development; Legislation No. 5 of 1982 in order to protect pastoral and forest areas, amended by Law No. 14 of 1992 and Law No. 7 of 1982 with a view to the safeguard of nature: Legislation No. 5 of 1972 and Legislation 7 of 1982 (General Environmental Authority, 2002).

2.8.9. Constraints and Prospects

Despite the efforts and accomplishments made to date, desertification needs to take into account its components and causes, manifestations and destructive effects. Wissenschaftler, natural resources manager and conservationist, identified various obstacles and challenges which should all be tackled, including (I) shortage of water assets and progressive dry spell periods which limit the achievement of horticultural activities, land recovery and development (2) Environmental change will cause district climate change that affects power and the recurrence of atmospheric factors such as temperature, precipitation, precipitation and drought (IPCC, 2007).

Water shortages in Libya are endemic and precipitation changes may represent a strain on the resources of freshwater, vegetation and wilderness (Tantawi, 2005). Today, many regions are inclined to desertification and the situation could become

even worse if environmental change and human exercises continue to cause land degradation in the nation. Climate elements contribute to both desertification and water shortage, and these problems are not exacerbated by unnecessary weather changes. It is not financially useful to restore the majority of the decertified land on the earth. However, if people cease to overuse and asset over-exploitation, desertification can be monitored everywhere and Board practices can effectively be executed (Mansour et al. 2011).

CHAPTER III

RESEARCH METHODOLOGY

This section examines the structure and methodology of the study adopted. Firstly,the assessment of the study adopts the views of the Libyan university students followed by the assessment of data collection and analysis tools. This section shows the correct analysis strategies. It illustrates the methods and methods used for the collection and analysis of information. The sample size, structure of analysis and method are definitely explained. In addition, this section discusses the procedures adopted and the tools used for information collection and also the various field problems and moral considerations experienced. This part also includes the statistical evaluation of factors contributing or hindering students ' awareness of destruction of arable land in Libya by Libyan universities.

3.1 Research Structure

The structure of this survey uses a quantitative approach in order to determine students' awareness of the desertification of Arable lands (Benabderrahmane, and Chenchouni, 2010). This approach is the statistical analysis of the data collected through questionnaires. Based on the objectives of the study and what the research intends to achieve, hypotheses and research questions were formulated and evaluated.

3.2 Sub-problems

Research Question 1

- Is age a factor that contributes to the level of desertification awareness among Libyan students?

Research Question 2

- Is gender a factor that contributes to the level of desertification awareness among Libyan students?

Research question 3

- Is residential location group a factor that contributes to the level of desertification awareness among Libyan students?

3.3 Research Design

The preferable study methodology to be adopted for this study will be in-line with the research questions and aims (Yin, 1994). The quantitative approach to questionnaires is a popular and an essential tool for acquiring public knowledge and natural hazard perception information. It is simple to administer, coded and analyzed together, allows comparisons to be made, and quantification to occur, while avoiding irrelevant responses (Benabderrahmane&Chenchouni, 2010). The completed questions are more likely to be produced. Nominal, ordinal, interval and ratio levels in closed questions are used to determine the degrees of difference.

The research design for this study entailed describing the objective of the study in relation to the problem statement for the study. The design aimed towards acquiring a deeper understanding of the factors posing as challenges to awareness of Libyan students of desertification. Statistical approach was adopted for clearer understanding of this concept.

The fundamental part of the study was the determination of the relationship between the study variables (Dependent and independent variables).The independent variables includedage, gender and location. While the dependent variable was "Awareness of desertification of arable lands in Libya" (Figure 3.1).

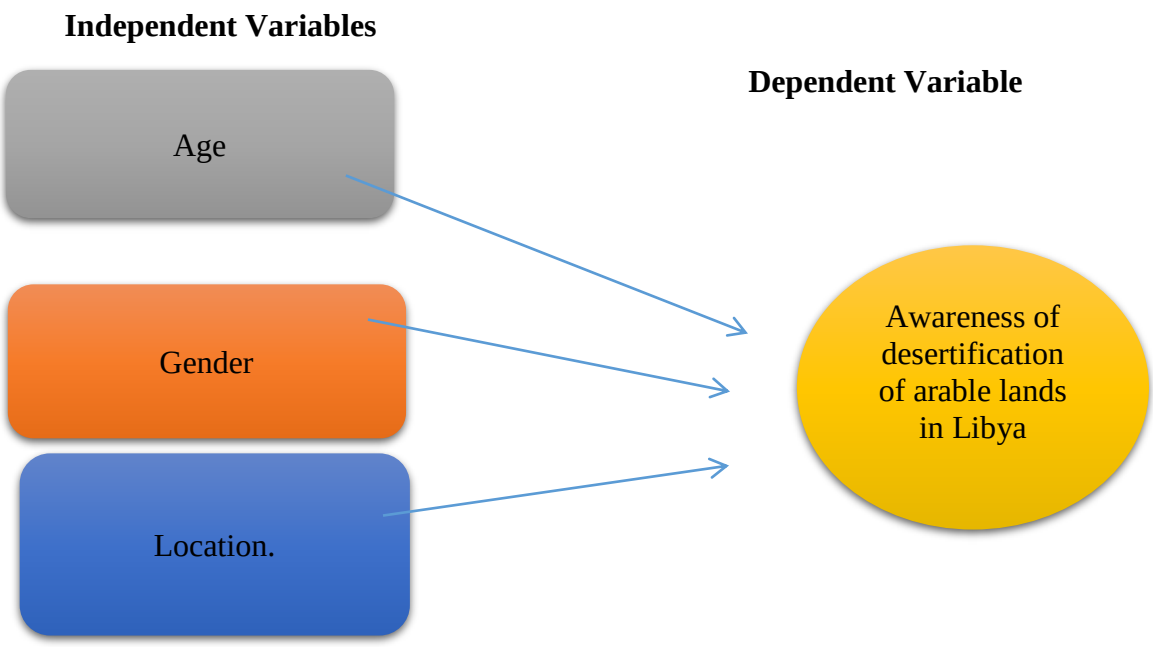

Figure 3.1 Summary of study research frame wor

3.4 Research Approach

In accordance with Copper's study, the research approach is quantitative (2006). Selectivity and distance from the object of research characterize a quantitative approach, while measures toward the research object characterize a qualitative approach (Bird, 2009). The quantification of data and generalizing results for the population of interest and the measurement of the impact of various opinions and views on a selected sample is a quantitative approach, while the qualitative approximation is a qualitative one for understanding underlying reasons and motive and providing insights into the identification of problems. The search for knowledge implies a quantitative approach that measures the phenomena of our reality and explains them.

3.5 Sampling procedure, sample population and sample size determination

3.5.1 Sample Design

- Population (270, 000 Libyan University students)
- Sampling Frame (students perusing their studies in Tripoli University)
- Sampling Unit (A student in Tripoli University)
- Sampling Technique (Non-probability convenience sampling method)
- Sample Size (500 out of 530 questionnaires were subjected to data analysis).

3.5.2 Sample Description

Students aged between 18 - 40 years from University of Tripoli were the participants in this research.A total of n= 500 studentswere interviewed**.**Due to the population of Libya of about 5.5 million, the idea of this type of sample was based on 1.7 million students, of whom 270,000 studied at the university level (the World education news).

3.5.3 Sample Size

The sample size used in thisstudy was determined in practice based on the cost of collecting data and the need for sufficient statistical capacity. The students in the University of Tripoli were randomly determinedas samples N=500, between the ages of 18-40.

3.5.4 Questionnaire Design

The questionnaire was designed in line with the objectives and study questions so as to capture the full view of respondents on the various factors revealing their awareness of desertification of arable lands in Libya. The questionnaire was composed of five parts:

Part A: Respondent's profile.

Part B: Non-aware of environmental problems and challenges

Part C: Non-aware of causes of desertification

Part D Non-aware of effect of desertification

Part E: Non-aware of desertification

Five hundred (500) comprehensive questionnaires were made available in line with the above reasons and due to the financial constraints of the study.

3.5.5 Data Collection

The sample area was Tripoli University. The method of questionnaire distribution was through one-on-one distribution method. The reason for this was to ensure clarity during the administration of the questionnaires, which were distributed in April as the students were still at university.

3.5.6 Data Analysis

All the data collected through questionnaireswere sorted out and put into statistical package for social sciences (SPSS) for statistical analysis which included ANOVA, co-efficient and correlation of variables, t-test, and regression analysis. The data were tested for their reliability by Cronbach's alpha reliability statistics.

3.5.7 Validity of the questionnaires

In survey analysis, internal coherence is usually adopted. It measures how well the various items in the survey measure the same notion. The calculation for the Cronbach alpha statistical factor analyzes the internal consistency.

Cronbach alpha analyzes the internal consistency between the combined groups of items. It is a statistical concept that demonstrates the uniformity of the dimensions. Generally speaking, 0.70 and higher reliability coefficients are considered

acceptable.

3.5.8. Ethical Considerations

Adequate care was taken to ensure that the privacy of respondents and firms that participated in this study was entirely confidential. However, respondents who took part in the study willingly volunteered to respond to the survey questions.

CHAPTER IV

FINDINGS AND INTERPRETATIONS

In this chapter, the students from the University of Tripoli analyze data from distributed questionnaires. The analysis of data was conducted using the Social Science Statistics Package (SPSS). This chapter includes also results and focuses on the descriptive statistics for demographic variables, the analysis of correlations and regression as tools to test the research questions.

4.1 Demographic background of the participants

4.1.1 Age distribution of the participants

Part of the variables chosen for this study is the Age group as a substantive factor in determination of awareness of university student of desert encroachment. Hence age group difference is considered as one of the variables in this study. From the age frequency distribution as presented in Figure 4.1, we can conclude that the age group of 18 to 23 has the highest percentage frequency distribution (47 %).

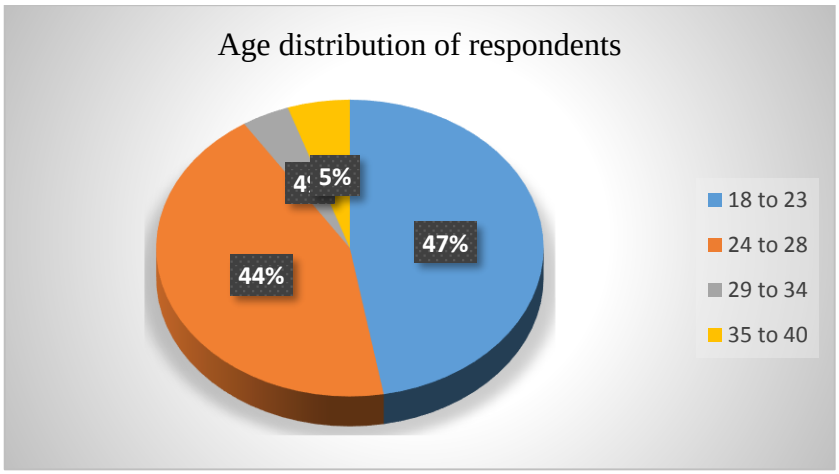

Figure 4.1 Age frequency distribution of the participants

4.1.2 Gender distribution of the participants

Gender factor is one of the variables considered in this study. It is hypothesized in this study that there exists a discrepancy among the gender groups in relation to their level of awareness of desert encroachments of arable lands in Libya. As presented in Figure 4.2, males have the highest gender percentage distribution (65.2%).

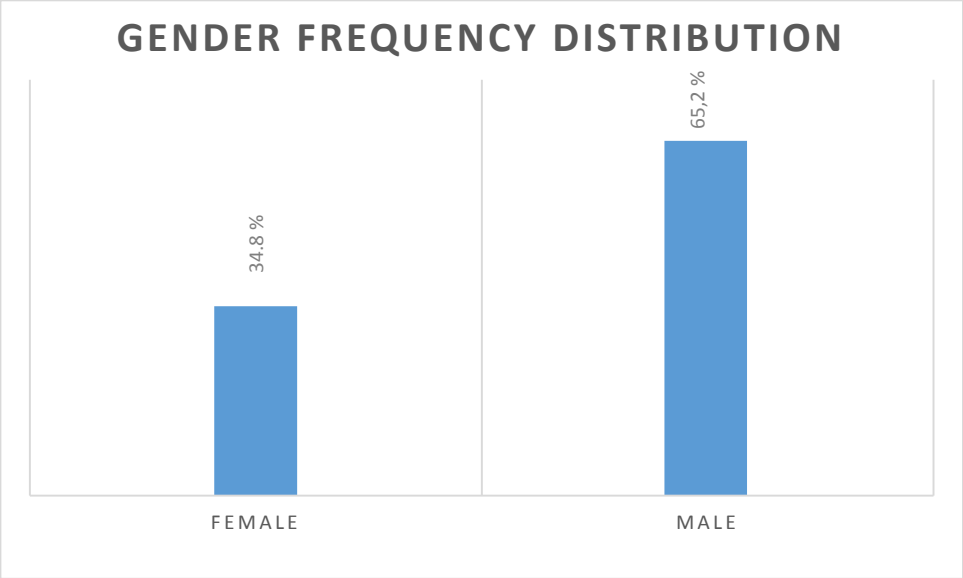

Figure 4.2 Gender distribution of the participants

4.1.3 Distribution of the participants' current level of study

Presented in Figure 4.3 is the frequency distribution of the students' current level of study. This is essential as it will determine if there exists a relationship between desert encroachment awareness and students level of study. The percentage frequency distribution as presented in Figure 4.3 shows that the 3rd year students have the highest percentage frequency distribution (40 %).

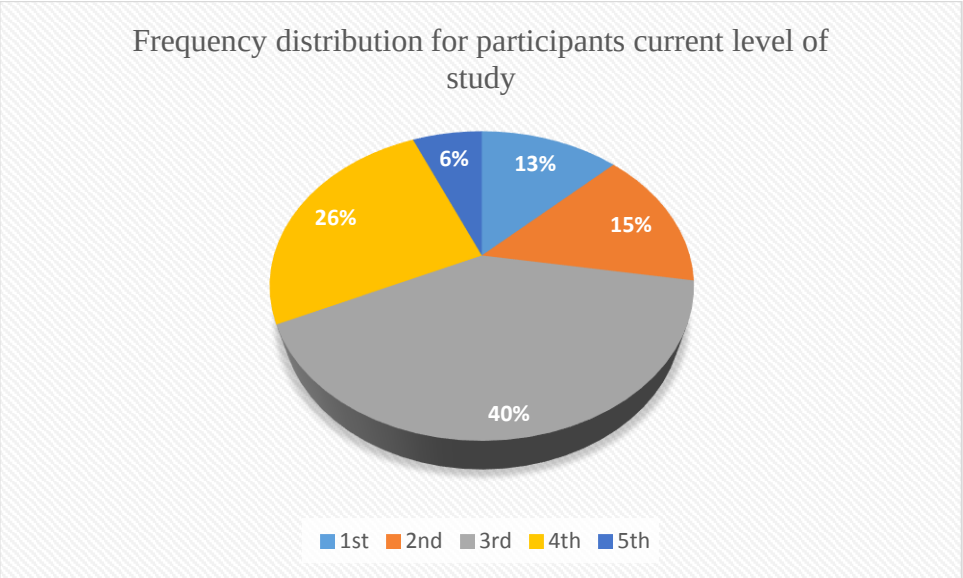

Figure 4.3 Distribution of the participants' current level of study

4.1.4 Distribution of the participants' current level of study

Awareness of environmental problems also relates to locations, as there are areas and locations that are most devastated by environmental degradation while some are not. Hence, this study intended to evaluate the awareness of Libyans of desert encroachment with regards to their dwelling area. From the distribution frequencies, it became obvious that the majority of the participants are from Urban settlement (Figure 4.4).

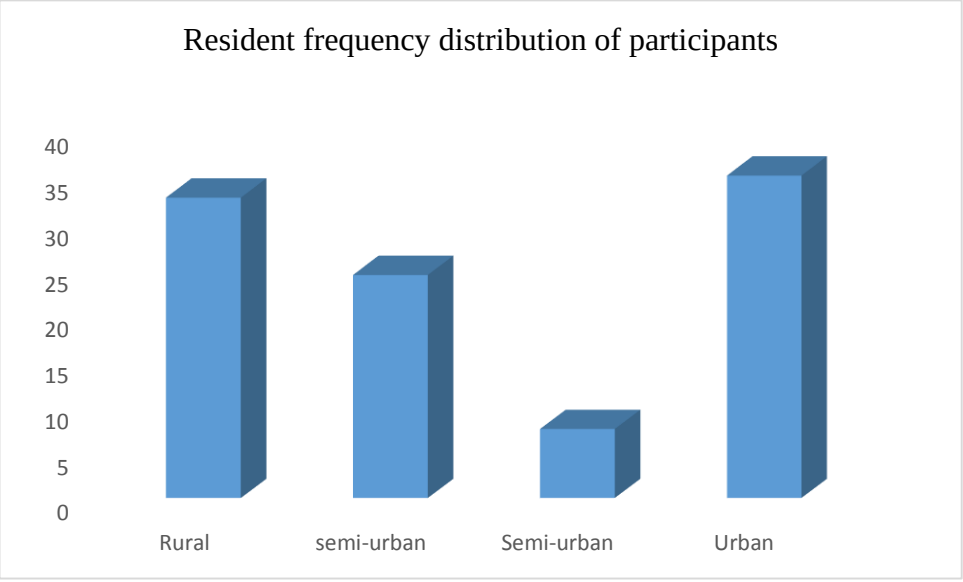

Figure 4.4 Distribution of the participants' residential area

Awareness of environmental problems also relates to locations, as there are areas and locations that are most devastated by environmental degradation while some are not. Hence, this study intended to evaluate the awareness of Libyans to desert encroachment with regards to their dwelling area. From the distribution frequencies, it became obvious that majority of the study participants are from Urban settlement (35.2 %).

4.2 Frequency distribution analysis of responds to questions by the participants

Table 4.1

Response to the question "I am concerned about the environment**"**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	10	2.0	2.0	2.0
	Moderately disagree	8	1.6	1.6	3.6
	Slightly disagree	26	5.2	5.2	8.8
	Slightly agree	228	45.6	45.6	54.4
	Moderately agree	228	45.6	45.6	100.0
	Total	500	100.0	100.0	

The study tried to reveal the level of concern of Libyan students towards environmental related issues. From the findings of the study, we discovered that the majority of the students slightly and moderately agreed to that notion (45.6 and 45.6 % respectively) as presented in Table 4.5.

Table 4.2

Response to the question "I am concerned about the extinction of endangered species"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	.8	.8	.8
	Moderately disagree	14	2.8	2.8	3.6
	Slightly disagree	72	14.4	14.4	18.0
	Slightly agree	266	53.2	53.2	71.2
	Moderately agree	144	28.8	28.8	100.0
	Total	500	100.0	100.0	

Desertification of arable lands is likely to lead to the extinction of endangered species as a result of drought and other environmental problems. Hence, it is essential that students should be aware of and concerned about the various factors that lead to desert encroachment. Form the frequency distribution table in Table 4.6 above, it can be seen that the majority of the respondents

Table 4.3

Response to the question "I am concerned that oil exploration has affected some localities in Libya"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.4	.4	.4
	Moderately disagree	18	3.6	3.6	4.0
	Slightly disagree	156	31.2	31.2	35.2
	Slightly agree	234	46.8	46.8	82.0
	Moderately agree	90	18.0	18.0	100.0
	Total	500	100.0	100.0	

Oil exploration is one of the main source of economic revenue in Libya. However, there is little to know preventive measures towards cubing the environmental impact of oil exploration in Libya. The non-awareness of the

environmental hazard caused as a result of oil exploration has been implicated to be one of the causes of negative attitude towards monitoring the adverse effect of oil exploration to the environment in Libya. This study once again tried to ascertain the participant's awareness of this notion. Form the findings as presented in Table 4.7 above it was revealed that the majority of the respondents slightly agreed that they were concerned about the effect of oil exploration on the environment.

Table 4.4

Response to the question "Desertification is an environmental problem"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.4	.4	.4
	Moderately disagree	8	1.6	1.6	2.0
	Slightly disagree	32	6.4	6.4	8.4
	Slightly agree	280	56.0	56.0	64.4
	Moderately agree	178	35.6	35.6	100.0
	Total	500	100.0	100.0	

The students were asked to share their opinion towards desertification as an environmental problem. As represented in Table 4.8 above it can be seen that the majority of the respondents (56%) slightly disagreed that desertification is an environmental problem.

Table 4.5

Response to the question "The changes in water quality have affected some localities in Libya"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	10	2.0	2.0	2.0
	Moderately disagree	10	2.0	2.0	4.0
	Slightly disagree	30	6.0	6.0	10.0
	Slightly agree	238	47.6	47.6	57.6
	Moderately agree	212	42.4	42.4	100.0
	Total	500	100.0	100.0	

Changes in the water quality is one of the attributes of desertification by Libyan students as if this has been the situations in some localities in Libya. From the findings of this study as presented in Table 4.9 frequency distribution revealed that the majority of the participants slightly agreed that there were changes in water quality among certain localities in Libya. This is something to look into as changes in water quality results in a lot of health risk both to humans and animals.

Table 4.6

Response to the question "Desertification is a treat to biodiversity"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	1.2	1.2	1.2
	Moderately disagree	30	6.0	6.0	7.2
	Slightly disagree	86	17.2	17.2	24.4
	Slightly agree	268	53.6	53.6	78.0
	Moderately agree	110	22.0	22.0	100.0
	Total	500	100.0	100.0	

In response to the question on desertification being a treat to biodiversity, the majority of the respondents (53.6%) as presented above, indicated that they slightly agreed with this issue.

Table 4.7

Response to the question "Deforestation is part of the causes of desertification"

		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly disagree	8	1.6	1.6	1.6
	Moderately disagree	26	5.2	5.2	6.8
Valid	Slightly disagree	142	28.4	28.4	35.2
	Slightly agree	232	46.4	46.4	81.6
	Moderately agree	92	18.4	18.4	100.0
	Total	500	100.0	100.0	

In response to the question on deforestation being one of the causes of desertification, the majority of the respondents (4646%), as presented above, indicated that they slightly agreed with this issue.

Table 4.8

Response to the question "Deforestation without sufficient reforestation has resulted in damage to habitat, biodiversity loss and aridity"

		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly disagree	6	1.2	1.2	1.2
	Moderately disagree	10	2.0	2.0	3.2
Valid	Slightly disagree	46	9.2	9.2	12.4
	Slightly agree	276	55.2	55.2	67.6
	Moderately agree	162	32.4	32.4	100.0
	Total	500	100.0	100.0	

In response to the question on deforestation without sufficient reforestation has resulted in damage to habitat, biodiversity loss and aridity, the majority of the respondents (55.22%), as presented above, indicated that they slightly agreed with this issue.

Table 4.9

Response to the question "Due to deforestation, the most dramatic impact is a loss of habitat for millions of species"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	1.2	1.2	1.2
	Moderately disagree	38	7.6	7.6	8.8
	Slightly disagree	124	24.8	24.8	33.6
	Slightly agree	264	52.8	52.8	86.4
	Moderately agree	68	13.6	13.6	100.0
	Total	500	100.0	100.0	

In response to the question above, the majority of the respondents (52.8%) as presented above, indicated that they slightly agreed with this issue.

Table 4.10

Response to the question "Trees support the water cycle by returning water vapor back into the atmosphere"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	8	1.6	1.6	1.6
	Moderately disagree	40	8.0	8.0	9.6
	Slightly disagree	124	24.8	24.8	34.4
	Slightly agree	264	52.8	52.8	87.2
	Moderately agree	64	12.8	12.8	100.0
	Total	500	100.0	100.0	

In response to the question on trees supporting the water cycle by returning water vapor back into the atmosphere, the majority of the respondents (52.8%) as presented above, indicated that they slightly agreed with this issue.

Table 4.11

Responses to the question "Deforestation increases the soil erosion"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.4	.4	.4
	Moderately disagree	22	4.4	4.4	4.8
	Slightly disagree	98	19.6	19.6	24.4
	Slightly agree	256	51.2	51.2	75.6
	Moderately agree	122	24.4	24.4	100.0
	Total	500	100.0	100.0	

In response to the question above, the majority of the respondents (51.2%) indicated that they slightly agreed with this issue.

Table 4.12

Responses to the question "Trees also play a critical role in absorbing the greenhouse gases that fuel global warming."

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	14	2.8	2.8	2.8
	Moderately disagree	46	9.2	9.2	12.0
	Slightly disagree	136	27.2	27.2	39.2
	Slightly agree	240	48.0	48.0	87.2
	Moderately agree	64	12.8	12.8	100.0
	Total	500	100.0	100.0	

In response to the question above, the majority of the respondents (48.0 %) indicated that they slightly agreed with this issue.

Table 4.13

Responses to the question "There been a decrease in agricultural production from oil exploration Zones in in Libya"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	22	4.4	4.4	4.4
	Moderately disagree	50	10.0	10.0	14.4
	Slightly disagree	154	30.8	30.8	45.2
	Slightly agree	218	43.6	43.6	88.8
	Moderately agree	56	11.2	11.2	100.0
	Total	500	100.0	100.0	

43.6 % of the participants indicated that they slightly agreed with this issue.

Table 4.14

Responses to the question "There has been decrease in yield of harvest due to deforestation"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	8	1.6	1.6	1.6
	Moderately disagree	30	6.0	6.0	7.6
	Slightly disagree	134	26.8	26.8	34.4
	Slightly agree	266	53.2	53.2	87.6
	Moderately agree	62	12.4	12.4	100.0
	Total	500	100.0	100.0	

The majority of the respondents (53.2 %) indicated that they slightly agreed with this issue.

Table 4.15

Responses to the question "There is a link between desertification and the rise in health care issues"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	24	4.8	4.8	4.8
	Moderately disagree	82	16.4	16.4	21.2
	Slightly disagree	252	50.4	50.4	71.6
	Slightly agree	122	24.4	24.4	96.0
	Moderately agree	20	4.0	4.0	100.0
	Total	500	100.0	100.0	

In response to the question above, 50.4 %, as presented above, indicated that they slightly disagreed with this issue.

Table 4.16

Responses to the question "The environment can recover on its own desertification"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	12	2.4	2.4	2.4
	Moderately disagree	106	21.2	21.2	23.6
	Slightly disagree	222	44.4	44.4	68.0
	Slightly agree	154	30.8	30.8	98.8
	Moderately agree	6	1.2	1.2	100.0
	Total	500	100.0	100.0	

44.4% of the participants indicated that they slightly disagreed with this issue.

Table 4.17

Responses to the question "Should the Libyan government laws on desertification be more strict, less strict or about as strict as they are"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	14	2.8	2.8	2.8
	Moderately disagree	70	14.0	14.0	16.8
	Slightly disagree	222	44.4	44.4	61.2
	Slightly agree	174	34.8	34.8	96.0
	Moderately agree	20	4.0	4.0	100.0
	Total	500	100.0	100.0	

In response to the question above, 44.4 % of the participants indicated that they slightly disagreed with this issue.

Table 4.18

Response to the question "There is a link between desertification and dryness of streams"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	1.2	1.2	1.2
	Moderately disagree	66	13.2	13.2	14.4
	Slightly disagree	186	37.2	37.2	51.6
	Slightly agree	220	44.0	44.0	95.6
	Moderately agree	22	4.4	4.4	100.0
	Total	500	100.0	100.0	

44.0 % of the respondents admitted that they slightly agreed with this issue.

Table 4.19

Responses to the question "Desertification makes Libyan lands to be prone to wind erosion."

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately disagree	16	3.2	3.2	3.2
	Slightly disagree	108	21.6	21.6	24.8
	Slightly agree	226	45.2	45.2	70.0
	Moderately agree	136	27.2	27.2	97.2
	Strongly agree	14	2.8	2.8	100.0
	Total	500	100.0	100.0	

45.2 % of the respondents slightly agreed with this issue.

Table 4.20

Responses to the question "Desertification causes extreme climatic conditions"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately disagree	16	3.2	3.2	3.2
	Slightly disagree	106	21.2	21.2	24.4
	Slightly agree	246	49.2	49.2	73.6
	Moderately agree	132	26.4	26.4	100.0
	Total	500	100.0	100.0	

49.2 % of the respondents indicated that they slightly agreed with this issue.

Table 4.21

Responses to the question "Desertification causes the migration of youths to urban cities"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately disagree	20	4.0	4.0	4.0
	Slightly disagree	100	20.0	20.0	24.0
	Slightly agree	268	53.6	53.6	77.6
	Moderately agree	112	22.4	22.4	100.0
	Total	500	100.0	100.0	

53.6 % of the respondents slightly agreed that desertification caused the migration of youths to urban cities.

Table 4.22

Responses to the question "Desertification causes low yield of crops"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately disagree	12	2.4	2.4	2.4
	Slightly disagree	108	21.6	21.6	24.0
	Slightly agree	260	52.0	52.0	76.0
	Moderately agree	120	24.0	24.0	100.0
	Total	500	100.0	100.0	

The majority of the respondents (52.0 %) admitted that they slightly agreed with this issue.

Table 4.23

Responses to the question "I am fully aware of desertification concept"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately disagree	14	2.8	2.8	2.8
	Slightly disagree	108	21.6	21.6	24.4
	Slightly agree	268	53.6	53.6	78.0
	Moderately agree	110	22.0	22.0	100.0
	Total	500	100.0	100.0	

In response to the question above, 53.6% admitted that they slightly agreed with this issue.

Table 4.24

Responses to the question "I have access to information regarding desertification of arable lands in Libya"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately disagree	12	2.4	2.4	2.4
	Slightly disagree	128	25.6	25.6	28.0
	Slightly agree	220	44.0	44.0	72.0
	Moderately agree	140	28.0	28.0	100.0
	Total	500	100.0	100.0	

44.0 % stressed that they slightly agreed with this issue.

4.3 Reliability statistics

Table 4.25

Cronbach's Alpha Reliability analysis

Cronbach's Alpha	N of Items
.856	24

Through quantitative analysis, the reliability and validity were determined, but not for cases where the data were evaluated, since opinions and answers from respondents could change at any one time. The quality of the data was expressed by using validity and reliability.

Contribution of the supervisor and also professionals in environmental education studies has strengthened the validation of the questionnaires.

Internal consistency was used to analyze how the same concept was measured in the study by different items. The internal consistency of the data was examined using Cronbach alphabetical factors.

Cronbach alpha is a statistical expression that indicates scale proximity. Generally accepted is a reliability coefficient of <0.07>. As shown in the table 3.1, the Cronbach alpha reliability is 0.856. Therefore, the study scale is categorically reliable.

4.4 Regression, Coefficients and ANOVA analysis of the research questions

4.4.1 Research question 1 (Age group as a factor that contributes to level of desertification awareness by Libyan students

Statistical analysis such as ANOVA and coefficient of variance was used to evaluate the data related to research question 2

4.4.1.1 Model summary for Research question 1

The R-Square (R^2) measurement coefficient (0.005) shows that regression equation has an exploratory power. This means that only 0.5 percent of the age group has an impact on the factors that make Libyan students aware of desertification.

Table 4.26

Model summary for research question 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.072[a]	.005	.003	.58408

a. Predictors: (Constant), Age group

4.4.1.2 ANOVA for research question 1

Table 4.27 reveals an F-statistic of 2.597 with a significant value of 0.108 which indicates that $p < .05$. Therefore, this study affirms that age factor is statistically significant in predicting the factors that contribute to level of desertification awareness by Libyan students.

Table 4.27

ANOVA result for research question

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.886	1	.886	2.597	.108[b]
	Residual	169.892	498	.341		
	Total	170.778	499			

a. Dependent Variable: Desertification awareness

b. Predictors: (Constant), Age group

4.4.1.3 Coefficients of variance determination for research question 1

Table 4.28 reveals a Beta value of 4.28 which confirms the positive relationship that exist between age groups as predicting factor in the level of desertification awareness of the Libyan students. The T- test value is 24.585 which also support the notion that age difference is part of the factors that affects the level of desertification awareness in Libya.

Table 4.28

Coefficients of variance for research question 1

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.236	.172		24.585	.000
	Age group	-.067	.042	-.072	-1.612	.108

a. Dependent Variable: Desertification awareness

4.4.2 Research question 2 (Gender group as a factor that contributes to level of desertification awareness by Libyan student).

4.4.2.1 Model Summary for research question 2

The R Square (R^2) coefficient of determination is 0.009, it shows the exploratory power of the regression equation. This implies that gender groups only account for 0.9 % impact on the factors that contribute to the level of desertification awareness by Libyan student.

Table 4.29

Model summary for research question 2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.002[a]	.009	-.002	.58560

a. Predictors: (Constant), Gender group

4.4.2.2 ANOVA for research question 2

Table 4.30 reveals an F-statistic of 0.001 with a significance value of 0.000. Therefore, this study affirms that gender factor is statistically significant in predicting the factors that contribute to the level desertification awareness by Libyan students.

Table 4.30

ANOVA result for research question 2

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.000	1	.000	.001	.000[b]
	Residual	170.778	498	.343		
	Total	170.778	499			

a. Dependent Variable: Desertification awareness

b. Predictors: (Constant), Gender group

4.4.2.3 Coefficient analysis for research question 2

Table 4.16 reveals a Beta value of 3.968 which confirms the positive relationship that exists between gender groups as a predicting factor in the level of desertification awareness of Libyan students. The T- test value is 22.629. This also supports the notion that gender difference is part of the factors that affects the level of desertification awareness in Libya.

Table 4.31

Coefficient analysis for research question 2

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.968	.175		22.629	.000
	Gender	-.002	.046	-.002	-.035	.972

a. Dependent Variable: Desertification awareness

4.4.3 Research question 3 (Residential location group as a factor that contributes to the level of desertification awareness by Libyan student).

4.4.3.1 Model Summary for research question 3

The determinant coefficient R Square (R^2) is 0.028, showing the exploratory power of the equation of regression. This means that student residence has an impact of only 0.5% on the factors that contribute to Libyan students' awareness of desertification.

Table 4.32

Model summary for research question 3

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.166[a]	.028	.026	.57744

a. Predictors: (Constant), Residential location

4.4.3.2 ANOVA

Table 4.33 reveals an F-statistic of 14.170 with a significance value of 0.000. Therefore, this study affirms that students' residential location difference is statistically significant in predicting the factors that contribute to the level desertification awareness by Libyan students.

Table 4.33

ANOVA result for research question 3

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.725	1	4.725	14.170	.000[b]
	Residual	166.053	498	.333		
	Total	170.778	499			

a. Dependent Variable: Desertification awareness
b. Predictors: (Constant), Residential location

4.4.3.3 Coefficients

Table 4.34 reveals a Beta value of 3.094 which confirms the positive relationship that exists between gender groups as a predicting factor in the level of desertification awareness of Libyan students. The T- test value is 13.342. This also supports the notion that students' residential location difference is part of the factors that affects the level of desertification awareness in Libya.

Table 4.34

Coefficient for research question 3

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.094	.232		13.342	.000
	Gender group	.242	.064	.166	3.764	.000

a. Dependent Variable: Desertification awareness

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Desert encroachment has proven to be an environmental hazard which not only affects humans, but also affects the biodiversity in the biosphere. Some of the associated climatic conditions as a result of desertification include extreme drought, poor water condition, poor performance of agricultural crops etc. The first step in solving any environmental problems is to be aware of the actual problem (Abahussain et al., 2002). Hence, it is essential to ascertain the level of awareness of Libyans towards desert encroachment of arable land in Libya. This study involved 500 students from Tripoli university. Statistical package for social science (SPSS version 21) was used for statistical analysis of the data. Sourced data were tested for their reliability using Cronbach's alpha reliability test which showed a value of 0.856 which is accepted as the value should be ≥ 0.70. 3. The variables were hypothesized for this study through 3 independent variables (age, gender and location). Frequency distributions, regression and coefficient of variance statistical analysis were used to determine the relationship between the independent and the dependent variables.

From the data analysis, it was observed that the majority of the respondents were within the age group of 18-23 years. Also, the male participants in the study more than the female folks with percentage frequency distribution of 65.2 % and 35.8 % respectively the findings is in line with study byBenabderrahmane, and Chenchouni, (2010). It was also discovered that the majority of the participants were urban dwellers followed by rural dwellers. The frequency distribution did show that the majority of the participants were concerned about the environment and desert encroachment of arable lands in Libya. It then boils down to what is the level of awareness of desert encroachment of Libyan arable lands among the age group, gender groups, and residential location groups**.** For the research questions 1, 2 and 3, the F-statistics is 2.597, 0.001 and 14.170 with significance value at 0.108, 0.000 and 0.000 respectively which indicates $P < 0.5$. Hence, the study affirms that there exists a relationship between awareness of desertification of Libyan arable lands and university students' age, gender and residential location.

5.2 Recommendation

The issue of environmental problems cannot be over emphasized as it directly affects humans, animals and the entire biosphere. Awareness of environmental problems can go a long way in cubing the negative impact it leaves in its wake. From the research findings, we discovered that location, gender and age are part of the factors that contribute to the level of awareness of environmental problems. Hence, this study recommends the teaching of environmental education to all humans regardless of age, gender and location. Also, this study recommends that governments should endeavor either through the media to make sure that environmental education reaches even to the remote areas in Libya. This study has thrown more insight onto awareness of desertification and hence so many factors need to be addressed. It further recommends that such studies should be conducted both in areas that are prone to environmental problems and those areas that are not. Also, study of the various factors that impedes the non-awareness of desert encroachment such as media publicity, government intervention and incorporation of environmental education in academic learning should be carried out.

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Annex 1: Questionnaire

NEAR EAST UNIVERSITY

DEPARTMENT OF ENVIRONMENTAL EDUCATION AND MANAGEMENT

Questionnaire

Dear participant,

I kindly invite you to be part of this study titled "Awareness of Libyan University students of desertification of Arable land of Libya".

This questionnaire is intended to be filled by Libyan nationals.

T thank you in advance for your contribution.

Section A: Demographics of respondents

Please tick (√) the appropriate space.

1) Age?

○ 18 to 23

○ 24 to 28

○ 29 to 34

○ 35 to 40

2) Gender?

○ Male

○ Female

3) In what year are you?

○ First Year

○ Second Year

○ Third year

○ Forth year

4) How would you describe the area in which you are living?
   - ○ Ur ban
   - ○ Semi-urban
   - ○ Rural

Part Two

Attitude/Motivation Test Battery (AMTB)

1- Strongly disagree
2- Moderately disagree
3- Slightly disagree
4- Slightly agree
5- Moderately agree

Section B: Non-awareness of Environmental problems and changes

5. I am concerned about the environment	1	2	3	4	5
6. I am concerned about the extinction of endangered species	1	2	3	4	5
7. I am concerned that oil exploration has affected some localities in Libya	1	2	3	4	5
8. Desertification is an environmental problem	1	2	3	4	5
9. The changes in water quality has affected some localities in Libya	1	2	3	4	5
10.Desertification is a treat to biodiversity	1	2	3	4	5

Section C: Non-aawareness of causes of desertification in Libya

11. Deforestation is part of the causes of desertification	1	2	3	4	5
12. Deforestation without sufficient reforestation has resulted in damage to habitat, biodiversity loss and aridity.	1	2	3	4	5

13. Due to Deforestation, the most dramatic impact is a loss of habitat for millions of species	1	2	3	4	5
14. Trees support the water cycle by returning water vapor back into the atmosphere.	1	2	3	4	5
15. Deforestation increases the soil erosion.	1	2	3	4	5
16. Trees also play a critical role in absorbing the greenhouse gases that fuel global warming.	1	2	3	4	5

Section D: Non-awareness of the effect of desertification in Libya

17. There has been a decrease in agricultural production from oil exploration Zones in in Libya	1	2	3	4	5
18. There has been decrees in yield of harvest due to deforestation	1	2	3	4	5
19. There is a link between desertification and the rise in health care issues	1	2	3	4	5
20. The environment can recover on its own desertification	1	2	3	4	5
21. Should laws be more, less strict or remain as they are?	1	2	3	4	5
22. There is a link between desertification and dryness of streams	1	2	3	4	5
23. Desertification makes Libyan lands to be prone to wind erosion.	1	2	3	4	5
24. Desertification causes extreme climatic conditions	1	2	3	4	5
25. Desertification causes the migration of youths to urban cities	1	2	3	4	5
26. Desertification causes low yield of crops	1	2	3	4	5

Section D: Awareness of Libyan University students of desertification

27. I am fully aware of desertification concept	1	2	3	4	5
28. I have access to information regarding desertification of arable lands in Libya	1	2	3	4	5

THANKS

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ORIGINALITY REPORT

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