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Awareness of desertification of arable land among university students in Libya

Conciencia de la desertificación de la tierra cultivable entre estudiantes universitarios en Libia

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ABSTRACT

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 to be aware of the actual problem. Hence, it is essential to ascertain the level of awareness of Libyans towards desert encroachment of arable land in Libya. 500 Tripoli university students were involved in this study. Four variables were hypothesized for this study with 3 belonging to the independent variable. 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 the level of awareness of desert encroachment of Libyan arable lands among the age, gender, and residential location groups. The study affirms that there exists 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, Libya.

RESUMEN

La desertificación es un problema ecológico grave, que incluye la dilapidación de la tierra en regiones secas, semiáridas y secas subhúmedas. Es causada básicamente por las actividades de la humanidad y las variedades climáticas. El primer paso para resolver cualquier problema ambiental es ser consciente del problema real. Por lo tanto, es esencial determinar el nivel de conciencia de los libios sobre la invasión del desierto de tierras de cultivo en Libia. 500 estudiantes universitarios de Trípoli participaron en este estudio. Se hipotetizaron cuatro variables para este estudio con 3 pertenecientes a la variable independiente. La distribución de frecuencias mostró que la mayoría de los participantes estaban preocupados por el medio ambiente y la invasión del desierto de las tierras de cultivo en Libia. El estudio afirma que existe una relación entre la conciencia de la desertificación de las tierras de cultivo libias y la edad, el género y la ubicación residencial de los estudiantes universitarios.

Palabras clave: desertificación, problema ambiental, invasión del desierto, Libia.

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I. INTRODUCTION

Desertification represents a serious environmental problem, including soil erosion within parched, semi-arid and dry sub-damp areas (Aboud, 2009). It is mainly triggered by human activity and climate. As Capozzi et al., (2018) stated, "Desertification results from a mixture of factors that vary after a certain period of time and vary by region." Libya faces a challenging problem of soil dilapidation and desertification due to its particular geological situation and its weather types (Davis, 2005). Projects for North Africa's environmental shift including Libya demonstrate increasingly alarming temperatures in counties which are efficiently concentrated on water and nutrition (Daza, Laguna, Monjeau, & Abramson, 2019). In particular, global climate shift could further exacerbate the level of dry land destruction and conceivable desertification (Gamoun, Belgacem, &Louhaichi, 2018).

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 (Gomaa, 2012). 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 (Hossein, Moghaddam, Sedighi, &Fasihi, 2018).

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 (Jiang, Bao, Jiapaer, Guo, & Zheng, 2019). 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 (Jiang & Lin, 2018).

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 crop 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 (Joseph, Gbenga, &Langyit, 2018). 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 (Mckay, 2016).

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

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 (Querol et al., 2019). 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 awareness among countries (Sherif, Sultan, &Sturchio, 2019). 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 (Standen, King, Millard, Gr, &Arriaza, 2018).

In this study, the need and importance of creating awareness of arable land desertification among Libyan students formed the basis of this study

II. 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 evaluate the effects of desertification.
- To depict the degree of desertification in Libya.

III. SIGNIFICANCE 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.

IV. 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.

V. METHODOLOGY

This section examines the structure and methodology of the study adopted. Firstly, the assessment of the study adapts 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.

A. Research Structure

The structure of this survey in 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.

B. Research question

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?

C. 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 included age, gender and location. While the dependent variable was "Awareness of desertification of arable lands in Libya" (Figure 3.1).

D. 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.

F. 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).

G. Sample Description

Students aged between 18 - 40 years from University of Tripoli were the participants in this research. A total of n= 500 students were interviewed. The student population size used for this study is 270, 0000.

H. 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 determined as samples N=500, between the ages of 18-40.

I. 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.

J. 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.

K. Data Analysis

All the data collected through questionnaires were 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.

L. 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. Cronbach alpha statistical factor was used to analyze 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.

M. 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.

VI. FINDINGS AND INTERPRETATIONS

Results of the data analysis from the sourced data are presented in this section. 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.

A. 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 thevariables in this

study. From the age frequency distribution as presented in Figure 1, we can conclude that the age group of 18 to 23 has the highest percentage frequency distribution (47 %).

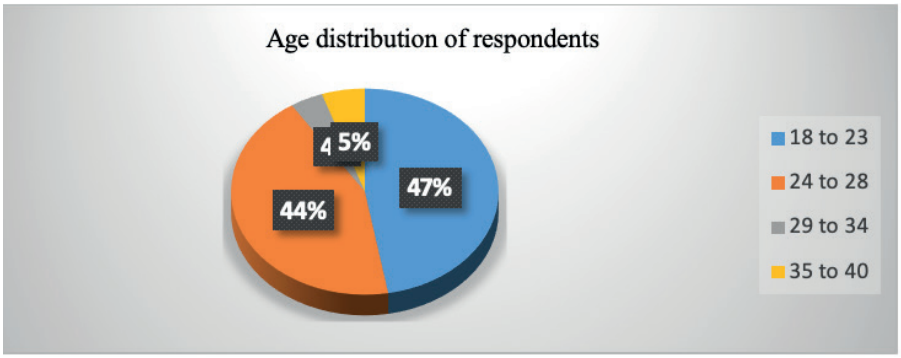

Figure 1 Age frequency distribution of the participants

B. 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 2, males have the highest gender percentage distribution (65.2%).

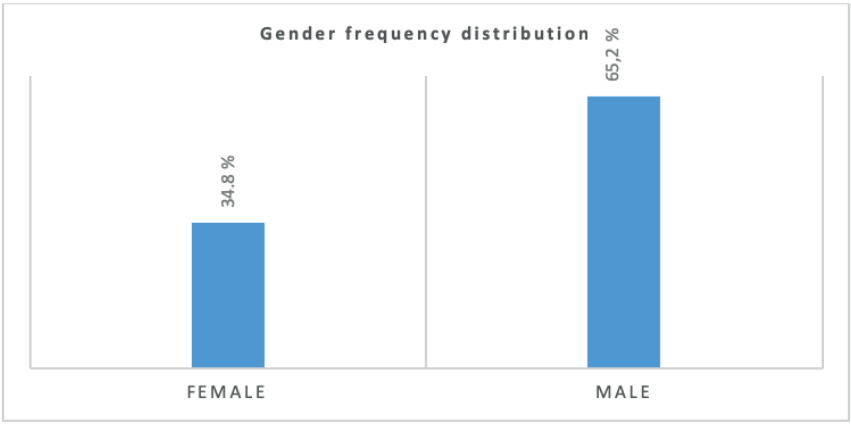

Figure 2 Gender distribution of the participants

C. Distribution of the participants' current level of study

Presented in Figure 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 3 shows that the 3rd year students have the highest percentage frequency distribution (40 %).

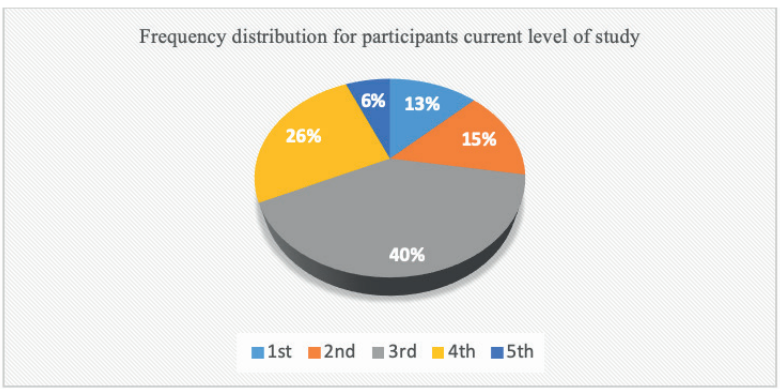

Figure 3 Distribution of the participants' current level of study

D. Distribution of the participants' current settlemt.

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).

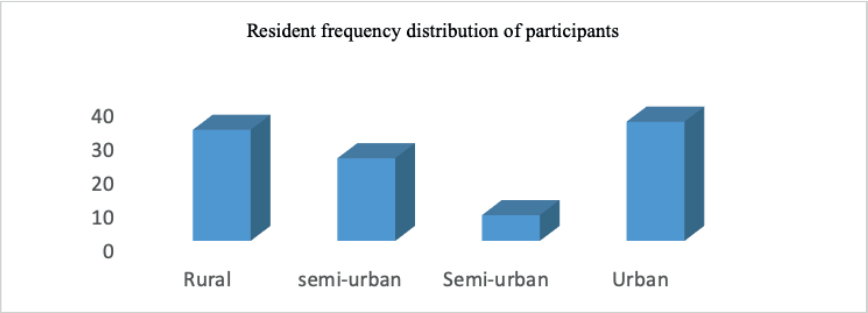

Figure 4 Distribution of the participants' residential area

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 %).

E. Reliability statistics

Table 1. 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 1, the Cronbach alpha reliability is 0.856. Therefore, the study scale is categorically reliable.

F. 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 2).

Table 2 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

G. ANOVA for research question 1

Table 3 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 3 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

H. Coefficients of variance determination for research question 1

Table 4 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 Coefficients of variance for research question 1

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

a. Dependent Variable: Desertification awareness

I. 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 5).

Table 5 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

J. ANOVA for research question 2

Table 6 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 6 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

K. Coefficient analysis for research question 2

Table 7 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 7 Coefficient analysis for research question 2

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

a. Dependent Variable: Desertification awareness

L. 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 8).

Table 8 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

M. ANOVA

Table 9 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 9 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

N. Coefficients

Table 10 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 10 Coefficient for research question 3

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

a. Dependent Variable: Desertification awareness

VII. 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),(Gunduz, et al, 2017). 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 are more than the female folks with percentage frequency distribution of 65.2 % and 35.8 % respectively the findings is in line with study by Benabderrahmane, 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 raises questions on 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.

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