



ENVIRONMENTAL EDUCATION AND AWARENESS TO PROTECT EGYPTIAN TORTOISE (TESTUDO KLEINMANNI) BY LOCAL COMMUNITY PARTICIPATION

Murad Buijlayyil¹, Aşkın Kiraz^{2,*}

¹Alhyat Organisation to Protect Wildlife and Marine Organisms, Dernah, Libya, muradbuijlayyil@gmail.com

²Near East University, Atatürk Faculty of Education, askin.kiraz@neu.edu.tr

Correspondence: askin.kiraz@neu.edu.tr, Tel: +903922236464/5432

Abstract

This research has examined the effectiveness of education and environmental awareness of the local population in protecting Egyptian tortoises. The study aimed to obtain information about the relationship between the level of education, monthly income and its relationship to tortoise protection and the prevention of smuggling and illegal trade. The results were obtained through the preparation of a questionnaire that included 40 people from the local population. They were surveyed using the SPSS26 program. According to the results obtained by the research, significant differences were found in the environmental attitudes of the local population who did not have a chance to have a good education and their monthly income was very low. It could be said that the people who got a good opportunity for education and their economic situation is sfigure, this has a positive impact on their environmental behaviour.

Keywords: Environmental education, environmental awareness, Egyptian tortoise.

Introduction

The Egyptian tortoise, Testudo Kleinmanni, is a small terrestrial tortoise which inhabits in sandy areas and dunes throughout north eastern Libya (Schleich, 1989), Northern Egypt, Sinai and eastwards to the Northern Negev in Israel (Flower, 1933; Iverson, 1986; Mendelssohn, 1982). The Egyptian tortoise is an endangered species threatened by habitat destruction and commercial collecting. Its scientific name is Testudo Kleinmanni and its native habitat is in the region of the middle of northern Libya to Palestine and it was classified and registered for the first time in Egypt. The Egyptian turtle is currently named as one of the most endangered wild turtles in the world and in Egypt. This type of turtles is about to be extinct in Libya due to the illegal trade and smuggling of such rare creatures in large quantities (Geffen and Mendelssohn, 1991).

Currently, the International Union for Conservation of Nature ranks, this species on the “Red List” as a species highly vulnerable to extinction, which is the highest degree before extinction from the wild. The Egyptian turtle in the mid- twentieth century, according to what is known about its history, inhabited a geographical area estimated at 123610 square kilometres, but now this area has decreased to 16600 square kilometres. As for its number, it has decreased to 85% from 55600 turtles to 7470. In such case, the Egyptian turtle may become extinct within the next 20 years (Baha El Din, 2006).

Today's remaining distribution area is limited to last small populations in the three provinces of Libya (Tripolitania, Fezzan and Cyrenaica) and in the northern regions of the Negev desert, near the border of Egypt. In Egypt, the original population is considered to be

extinct. However, new populations have been successfully resettled for several years by breeding-programs (St John, 2015). *Testudo Kleinmanni* lives in Libya on solidified, sometimes very stony sandy soils or in the sand dunes of the desert on the edges areas of the Negev desert (Attum, 2007).

A hundred years ago the original range of the Egyptian tortoise existed in limited areas on, the coastal strip of Libya (approximately 90 km) through Egypt and the Sinai Peninsula to the northern regions of the Negev desert of Israel. Over the years, the habitat of *Testudo Kleinmanni* has been increasingly destroyed by human hands. The construction of large hotel complexes, the use of land for grazing livestock or military stations and roads are the main causes of this habitat destruction. But also the collection of thousands of specimens for sale in Egyptian markets and pet shops or for the illegal transport into the world, have so decimated the populations of the Egyptian tortoise, that nowadays only small populations in Libya, the origin populations are now considered to be extinct in Egypt (Murphy, 2016; Whitford, & Duval, 2019). In 1995, the Egyptian Tortoise was placed under the protection of the Washington Convention, it is listed in Appendix 1. In the IUCN Red List, it has been classified as "critically endangered" - threatened with extinction since 2003 (Mulliken, 2009).

The ecological knowledge and participation of local communities can contribute to the conservation of biodiversity. Members of a local community often have field skills, such as tracking, and ecological knowledge such as species identification, as well as knowledge of an animal's behaviour, that people from outside the community often lack (Berkes, 2004; Gerhardinger, Godoy, and Jones, 2009). Local communities often reside or use the natural resources in protected areas or parks because these areas are their traditional grazing grounds or may have religious significance. In addition, local communities may also depend on wildlife populations for food, resale of meat, or resource use. Conservationists may try to protect these wildlife resources by making conservation of wildlife financially more lucrative through alternative sources of income, such as ecotourism, employment in conservation work, or craft initiatives (Grainger, 2003; Joa, Winkel, and Primmer, 2018; Townsend et al., 2005).

Objective of Study

This study was planned and carried out for the following purposes:

- Preserving the Egyptian tortoise, especially after its release,
- Awareness and appraisal of society about the role of these tortoises in nature, especially since this species is nearing extinction,
- Local community participation and ex situ conservation has the potential to assist the recovery of the endangered Egyptian tortoise (*Testudo Kleinmanni*).

Research Questions

In line with the purpose of the study, the following research questions were formed and the study was completed in parallel with these research questions.

- Does the level of education impact the preservation of Egyptian tortoises?
- Does the monthly income make any difference in the process of smuggling and selling Egyptian tortoises?
- What is the level of environmental awareness of the local population?
- What is the effect of attending environmental lessons and lectures on preserving Egyptian tortoises?

Study Area

The study was conducted west of the town of Darnah, in the east of Libya, near Wadi al-Naqa to the west of Derna, about 10 km (32°44'57.0"N 22°33'08.7"E) since this region is rich in biological variety and also is one of the suifigure lands for the Egyptian tortoise to live in. for several reasons, the most important of which is the abundance of food and the good climate for the breeding of these tortoises.

Methodology

In this study, the collection and analysis of the data obtained in line with the aims and sub-objectives of the study was carried out according to qualitative research methods. This study mainly focused on determining the efficiency of the local population to improve environmental awareness in the region. This study was based on a field study conducted in the western city of Derna, Libya. The method applied in this study to make it more reliable is the qualitative method using the structured research form.

Participants and Samples

The study was conducted in the eastern part of Libya among 40 local people in Wadi Al Naqa, west of the city of Derna, Libya. This study has focused on adult and eligible population and the criteria used in this study include being a permanent resident in the study area and on willingness to adhere to the study protocols and complete the study. Each person was given structured questionnaire by researcher. Participants were first informed about the purpose of the study, and it was explained to the participants that they would make a scientific contribution by filling out this form. With the foresight that it might involve a sensitive and illegal situation, it was stated that no identity information would be requested from the participants, and their sincere answers would never be used against them.

Data Collection Tools

In this study, which was planned to increase the environmental awareness of the local population in the protection of the endangered Egyptian turtles, a structured interview form was prepared by the researcher. The first section of that form involves a demographic information form, in which personal information was measured first. The demographic form focused on educational statuses, information about monthly income and whether a person previously attended environmental lectures or not. As the second section, the Egyptian Turtle Awareness Form prepared by the researcher in a structured manner in accordance with qualitative research methods was also used. The structured form was created in line with the opinions of five experts in the fields of science, linguistics, biology, ecology and environmental education. The questions in the measurement tool are structured to uncover the scope of environmental awareness, gain insight into preventing the large number of illegal smuggling and sales of Egyptian turtles, and revealing the impact of turtle reduction on the environmental balance in Derna, Libya.

Data Analysis

The data obtained in this study, which aims to reveal the awareness of the participants about the protection of the Egyptian tortoise and the environment, was personally analysed by the researcher. The data obtained in the study were analysed by content analysis in accordance with qualitative research methods. The analysis of the obtained data is presented

comparatively with figures of frequency and percentage. Percentage calculations are based on the number of respondents rather than using a total sample.

Validity and Reliability

In order to make the research reliable, validity and scientific process research ethics were taken into consideration. Questions were given directly to the participants. The researcher showed a serious attitude in order not to affect the research and made explanations when necessary. The researcher gave the participants the required time while applying the forms and acted objectively in adverse situations.

Results and Discussion

A qualitative research approach was used to achieve the aims of the study. This research includes the general information and the statistical analysis of the data collected according to the research procedures described.

Figure 1.
Relationship Between Education Status and Collected Tortoises to Be Sold

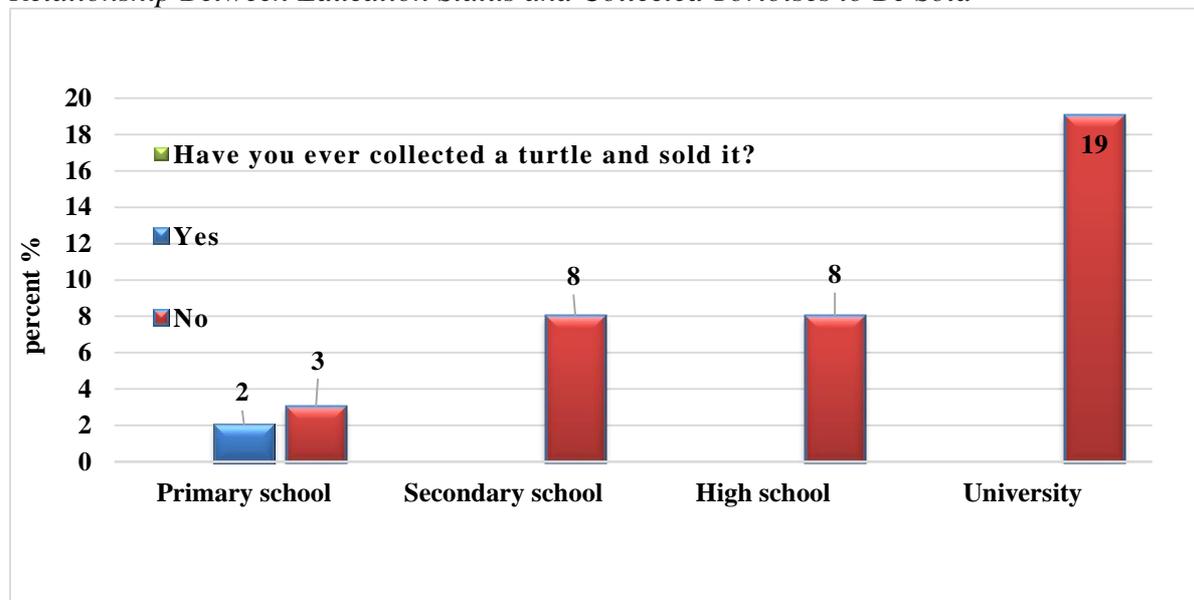


Figure 1 examines the relationship between education level and turtle sales. This figure can be interpreted as the reflection of the level of education on environmental awareness. Well-educated people, unlike those who do not have a good education, have not collected and sold Egyptian turtles before. People with low education levels are targeted by smugglers because they do not know enough about the importance of these endangered tortoises' species.

Figure 2.
Relationship between Income Monthly and Collected Tortoises to Be Sold

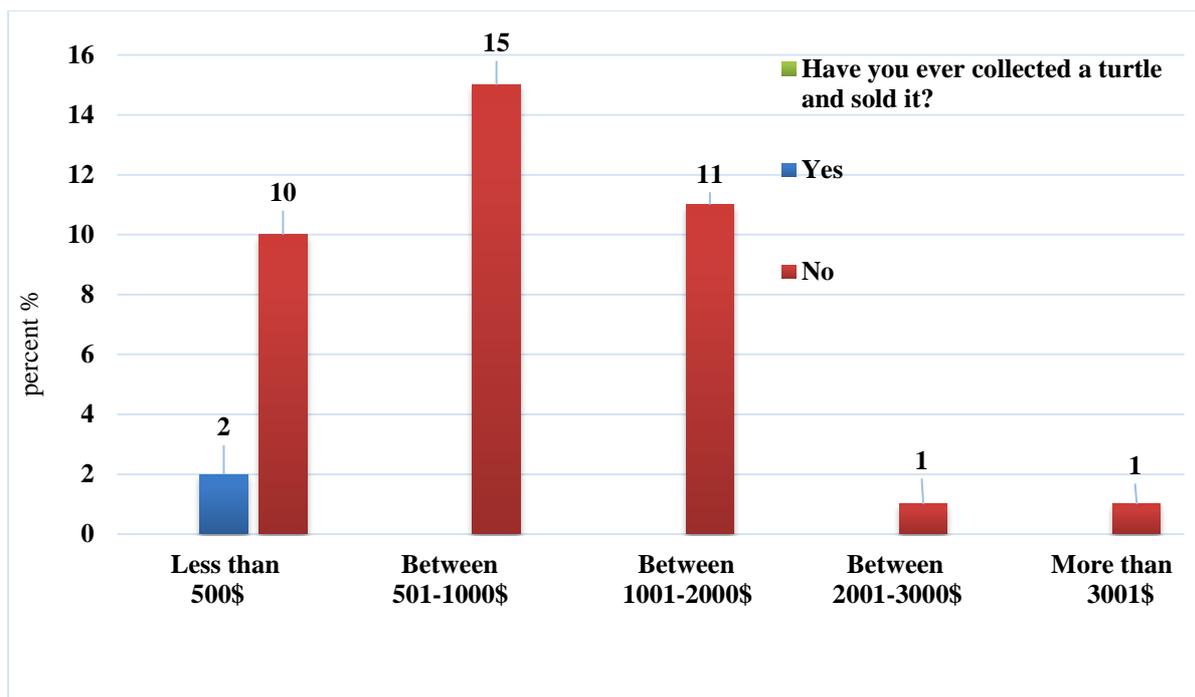


Figure 2 examines the relationship between monthly income and turtle sales. As can be seen from the figure, those with a monthly income of more than \$ 501 have never sold turtles. This figure reveals that, in fact, the financial situation affects environmental awareness. People can resort to illegal methods for the sake of earning money and easily ignore the balance of nature. Smugglers use such people by paying low-income people and using their simple financial situation.

Figure 3.

Relationship between Education Status and Received Environment Lessons

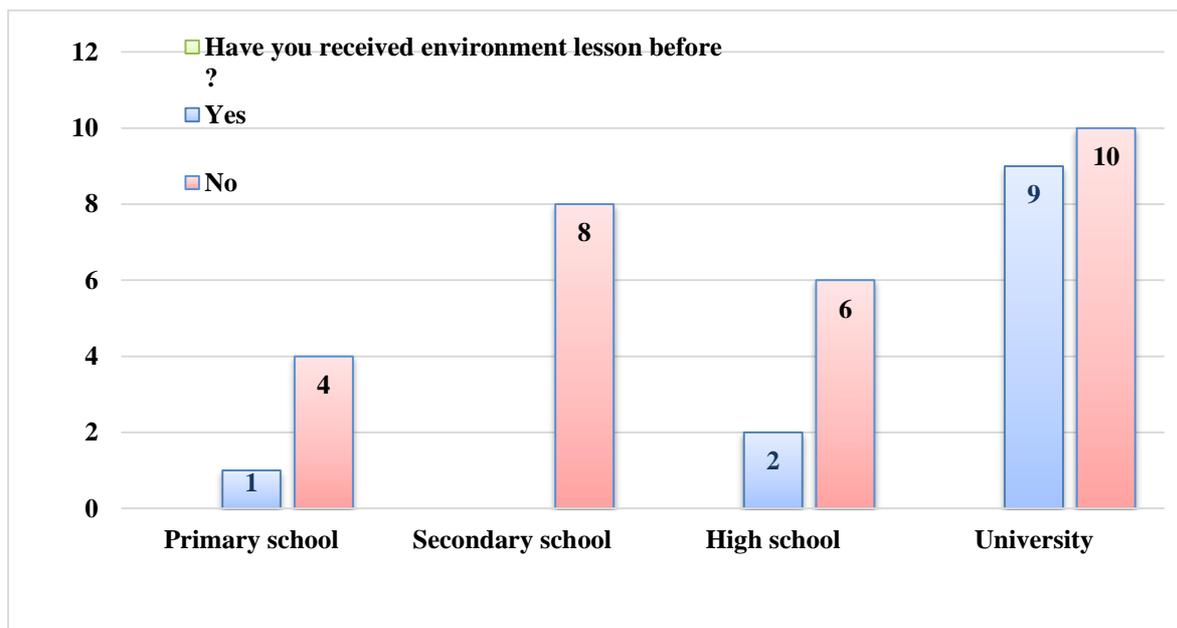


Figure 3 shows the relationship between education level and taking lessons on the environment. "Yes" answers are mostly intended for students studying at universities. It is obvious that taking environmental awareness lectures and conferences is an effective reason for increasing environmental awareness and culture in society.

Figure 4.
Relationship between Education Status and Reducing Smuggling

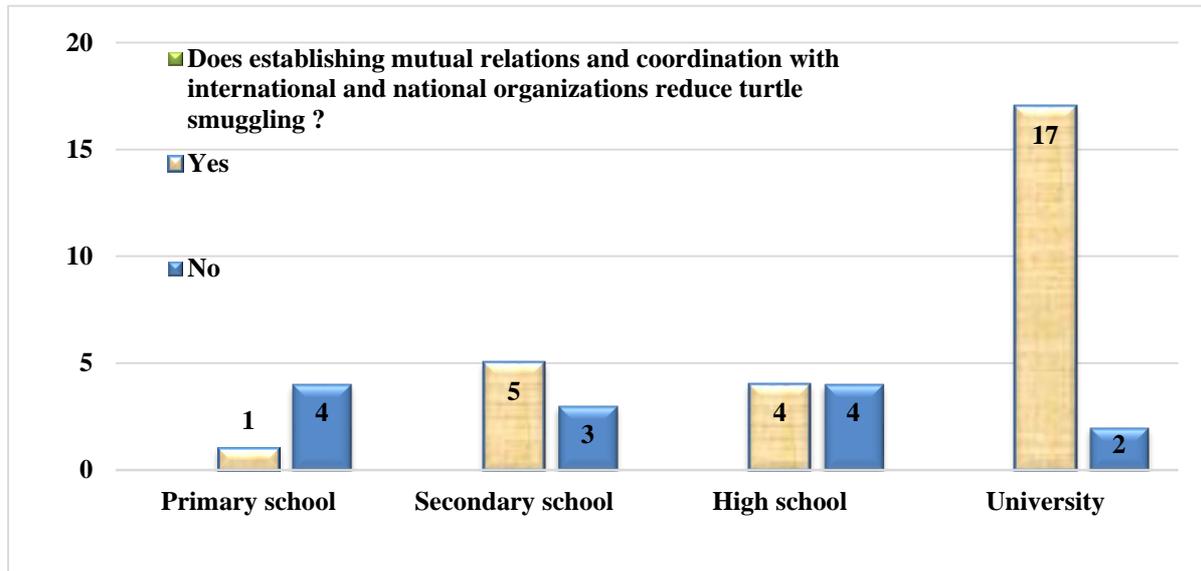


Figure 4 examines the effects of international and local organizations operating in the fields of education and environment on raising environmental awareness. Many of the responses to nature conservation stem from the notion that collaborating with such communities is effective. The majority of "Yes" answers are from a higher education level.

Figure 5.
Relationship between Education Status and Protection of Turtle Species through an Education Program

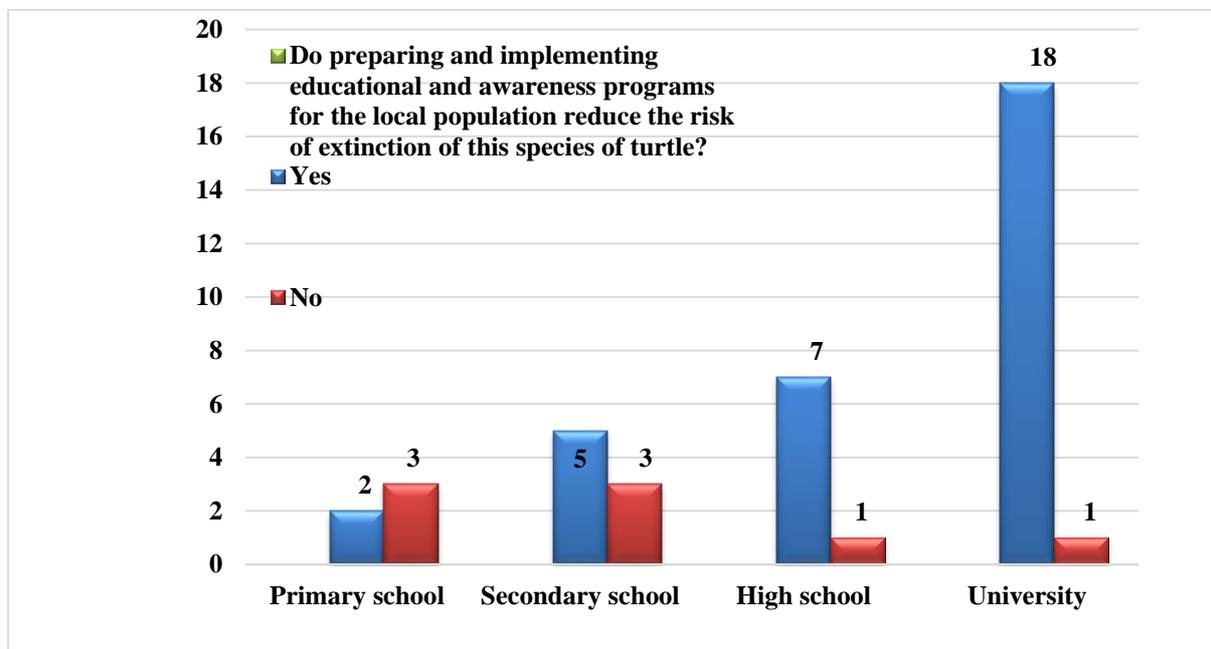
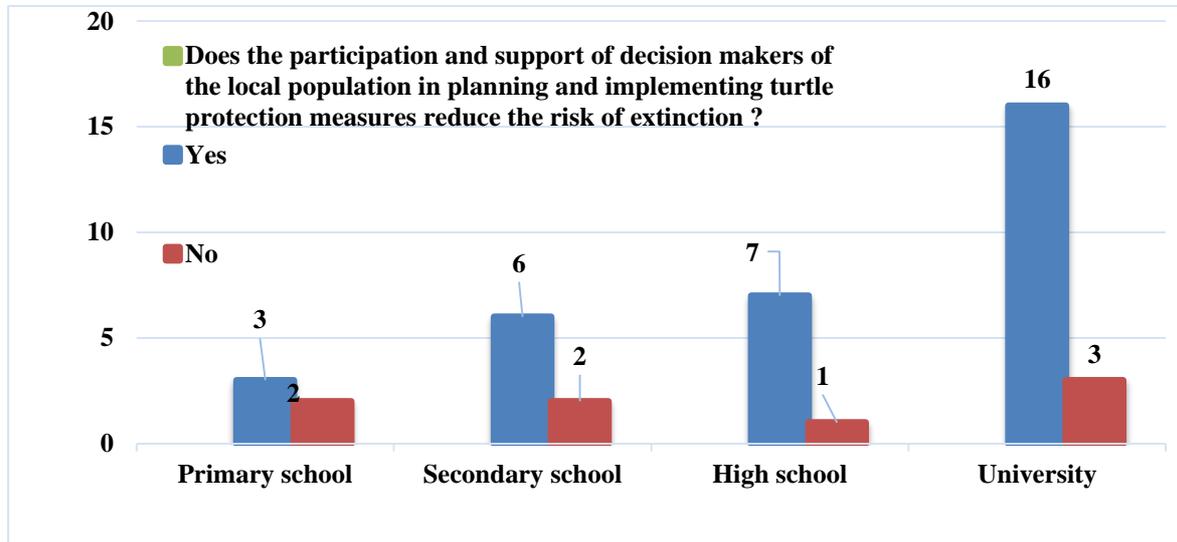


Figure 5 shows the relationship between educational status and the implementation of education and awareness programs for the local population to reduce the extinction risks of such turtle species. It also appears that most of the responses to the decision to implement education and awareness programs for local residents, including university students, are "yes"

because of their knowledge of the importance of protecting Egyptian turtles in the local environment.

Figure 6.

Relationship between Education Statuses and Planning Turtle Protection Measures



In Figure 6, the relationship between the participation and support of local decision-makers in the planning and implementation of turtle protection measures that reduce extinction risks and their educational status is analysed. It seems that most of the "yes" responses come from university students who accepted this support. As the education level increases, the idea that it will benefit everyone in terms of providing logistical and financial support to the local population is spreading. It is believed that those who do not agree with this support idea do not trust decision-makers.

Figure 7.

Relationship between Education Statuses and Foreign Partners

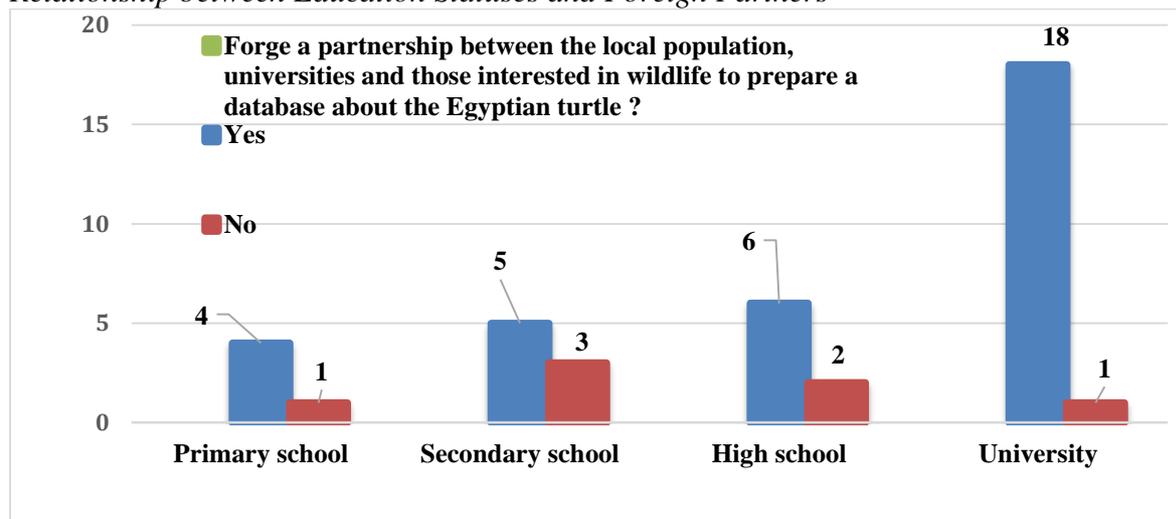


Figure 7 shows the relationship between educational status and establishing a partnership between the local population, universities and foreigners interested in wildlife to prepare a database on Egyptian turtles. Most of the positive responses given were received from university students. Because it is thought that there will be a mutual benefit between

researchers, university students and local population in order to prepare and protect a database on the Egyptian tortoise and to know its role in the local environment.

Figure 8.
Relationship between Education Statuses and Providing Governmental Support

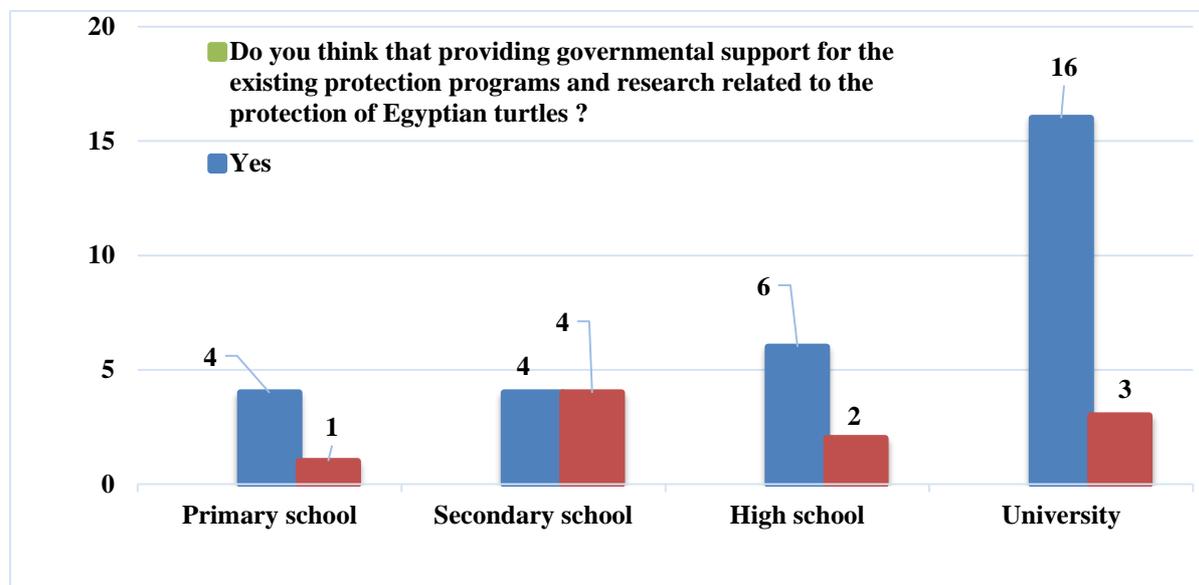


Figure 8 shows the relationship between educational status and state support for current conservation programs and the frequency of research on Egyptian tortoise conservation. Most of the "Yes" answers also come from university students. It would be appropriate to emphasize the importance of state support in the preparation of environmental awareness programs with government support within the Ministry of Environment in order to protect biological diversity and ensure that all kinds of wildlife, especially the environment, are not removed from nature. It can be seen from these data that the awareness that Egyptian turtles are under the threat of extinction is related to the people's education level.

Figure 9.
Relationship between Education Statuses and The Impact of Education and Awareness On Smuggling

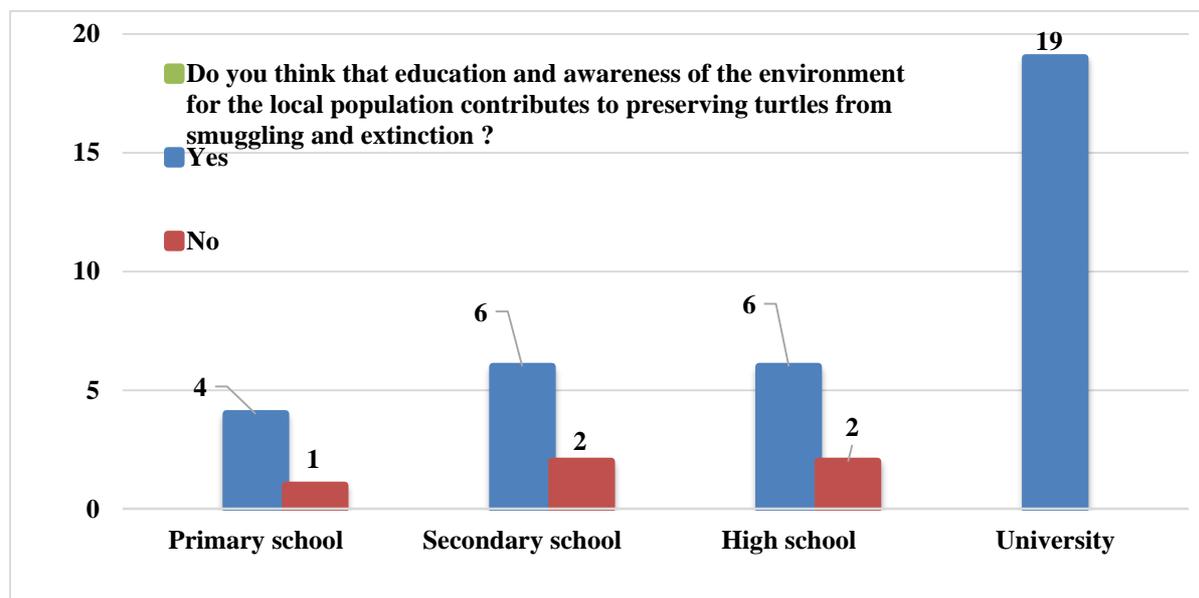


Figure 9 shows the data on the prevention of smuggling of turtles and protection against extinction by increasing the educational status and environmental awareness. Most of the answers are given as "Yes". Increasing environmental education and environmental awareness will contribute to positively changing the behaviour of the local population. Raising the level of environmental education, creating an environmentally friendly person and increasing the protection of the environment is an important contribution to the protection of Egyptian Tortoises.

Figure 10.

The Relationship between Education Statuses and Identifying Areas to Prevent Collecting Turtles

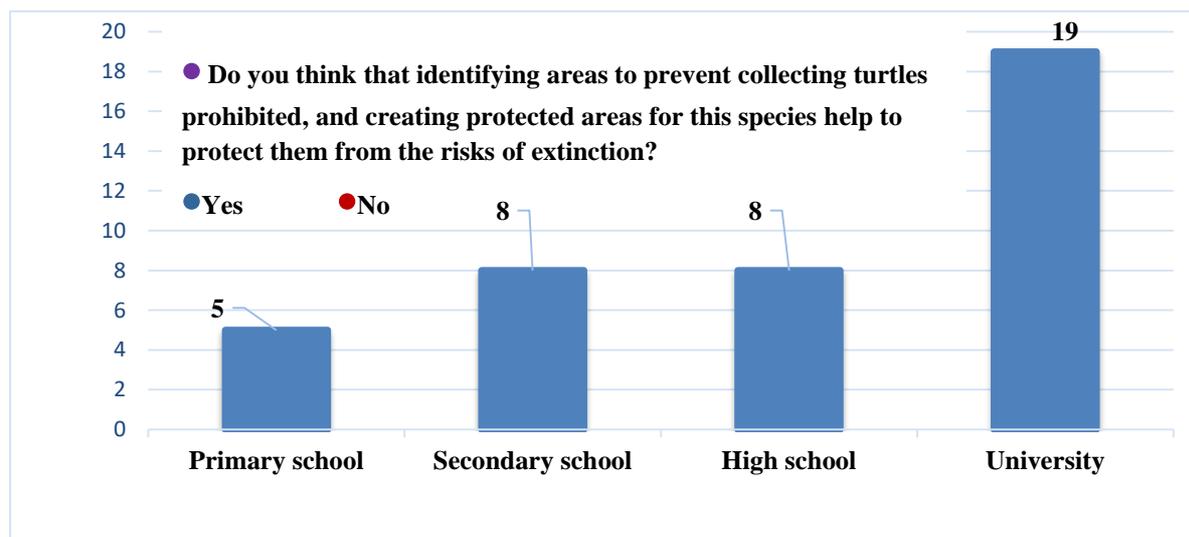


Figure 10 shows the relationship between educational status and identifying areas that prevent turtles from gathering and establishing protected areas to help protect these species from extinction risks. As can be seen from the figure, all answers are "Yes". Education level does not seem to make a difference at this point. It is known that the preparation of protected areas where Egyptian turtles are gathered for smuggling is prohibited. This rule is one of the most important factors contributing to the protection of turtles from illicit trade and their increase in reserves.

Discussion and Conclusion

This study aims to increase the awareness about environmental education among the local population in the Wadi al-Naqa area to help for reducing the risks of extinction in the Egyptian tortoise.

1. The answers given to the question used in this study were compared with the education levels of the participants. Answers vary according to education level, and the majority of positive answers belong to university students.

2. As a result of the evaluation of the answers given by the participants to the question about their monthly income, it was understood that the answers vary according to the economic situation. Most of the answers are that the monthly income is between medium to low and this is an important factor in this study and has an impact on the protection of turtles and their protection from illegal trade.

3. As a result of the evaluation of the answers given by the participants to the question regarding their taking environmental lessons, it was seen that most of the "yes" answers were received from university students. This means that environmental classes are being taught at the university and is a positive sign in the process of raising environmental awareness, thereby contributing to the conservation of Egyptian turtles.

4. Most of the answers given to the question that establishing mutual relations and coordination between international and local environmental organizations will reduce turtle smuggling are "yes". Answers came from university students due to their knowledge of the positive aspects of international environmental organizations through the exchange of experiences in the field of conservation of nature and biodiversity, particularly in the field of conservation of turtles.

5. Most of the views that the preparation and implementation of education and awareness programs for the local population reduces the risk of extinction of such turtles have been in favour of developing programs that further educate the community about the risk of removing a species from the biological environment.

6. Respondents were asked for their views on the participation and support of local decision makers in the planning and implementation of turtle conservation programs that reduce the risk of extinction. Many of the answers supported the participation in decision making and the initiation of local programs that helped reduce the risk of extinction of turtles.

7. Participants in the study were asked for their views on "establishing a partnership between the local population, universities and those interested in wildlife to prepare a database on Egyptian turtles that contributes to the reproduction of this species in nature". According to the answers, it was seen that the participants from the university education level with scientific research knowledge dealing with the environment and wildlife protection area supported this partnership.

8. The final question of the research is "Do you think that detecting areas that inhibit turtle picking is prohibited, and the creation of protected areas for these species helps protect them from extinction risks?" After knowing the danger posed by the massive smuggling and congregation of Egyptian turtles causing an imbalance or disturbance in the ecosystem, all the responses supported the idea of protected areas.

In order to increase environmental sensitivity in the first place, the level of awareness of the local population about the environment and the protection of species from extinction should be raised, and family levels of awareness of environmental sensitivity should be raised. To increase the environmental perception of the participants, adding mandatory environmental lessons to the curriculum in primary, middle and high schools, the students' knowledge and sensitivity will increase and their positive behavior to the environment will be developed.

For the biological diversity, especially in the field of protecting Egyptian tortoises, it is also necessary for the legislative authority to make more efforts to enact applicable laws, and for the executive to enforce these laws, and to punish those who do not obey them. In addition to all this, it is estimated that the planning activities undertaken by the government, educational institutions and NGOs to support formal and informal education will increase environmental attitudes and awareness to protect the Egyptian tortoise from extinction.

As a result of the analysis of the data, it was determined that there are differences in environmental awareness and environmental culture, especially in education level and monthly income. Analysis show that those who collect and sell turtles cannot find a good educational opportunity and their monthly income is low. Financial status and educational

background is a strong cause in Egyptian tortoise smuggling operations. The low level of education indicates that the presence of turtles in nature affects the awareness of their active role in protecting environmental balance and biodiversity.

Recommendations

Based on the results of this study, the following recommendations have been developed.

1. With intensive workshops and training courses, environmental awareness and education of local people can be increased in the protection of Egyptian turtles and their environment.
2. Due to its negative role in protecting living things and the environment in general, the state needs to develop a strategy to combat poverty and unemployment.
3. A national database of turtle numbers and locations should be prepared to contribute to their conservation, and community engagement with local and international environmental organizations should be ensured.
4. In regions where turtles are located, celebrations, festivals and events should be organized every year with the participation of local people, and the role of turtles in environmental balance and biodiversity should be clarified.
5. All guilty should be punished in order to prevent the illegal sale and smuggling of turtles and not to expose the Egyptian tortoise to abduction or risk of extinction.

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