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CONSCIOUSNESS LEVELS OF LIBYAN STUDENTS ON ECOLOGICAL FOOTPRINT AND SUSTAINABLE LIFE

MASTER THESIS

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ABSTRACT

CONSCIOUSNESS LEVELS OF LIBYAN STUDENTS ON ECOLOGICAL FOOTPRINT AND SUSTAINABLE LIFE

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Unconscious consumption of our sources together with increasing human population and industrialization at the present time has increased the pressure of people on nature. Deterioration of natural balance and consequently emerging environmental problems entail people to re-take up life styles and consumption habits and make controlling regulations towards environment. In this context, ecological footprint is an environmental educational tool, which is quite influent for providing individuals with sustainable consumer identity by demonstrating the level of pressure of people on nature. Based on such information, the purpose of the study is to investigate the determination of consciousness levels of Libyan university students on ecological footprint and sustainable life.

The universe of the study consists of university students studying in Libya in 2016-2017 academic year. The research exemplary consists of 246 female, 254 male, a total of 500 students studying in the same academic year.

The data was collected from the students studying in 2015-2016 academic year in Libyan universities, when they were suitable. The researcher was present with the university students while filling data collection tools and made any clarification that would be necessary. The data was analyzed by using SPSS-20 (Statistical Package for the Social Sciences) package program. In analyzing the data and investigating the statistics T-test, ANOVA, Tukey test, Frequency test, and Descriptive test techniques were used.

Based on the results obtained from the research, it was found out that consciousness levels of Libyan university students on ecological footprint and sustainable life is at intermediate level.

ÖZET

LİBYA'DAKİ ÖĞRENCİLERİN EKOLOJİK AYAK İZİ VE SÜRDÜRÜLEBİLİR YAŞAM İLE İLGİLİ BİLİNÇ DÜZEYLERİ

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Günümüzde artan insan nüfusu ve sanayileşme ile birlikte kaynaklarımızın bilinçsiz tüketimi bireylerin doğaya yaptığı baskının boyutunu arttırmıştır. Doğal dengenin bozulması ve beraberinde oluşan çevre sorunları insanların yaşam tarzlarını ve tüketim alışkanlıklarını yeniden ele almasını ve çevreye yönelik kontrol edici düzenlemeler yapılmasını gerektirmektedir. Bu bağlamda ekolojik ayak izi, bireylerin doğaya yaptığı baskının boyutunu göstererek bireylere sürdürülebilir tüketici kimliği kazandırmak için oldukça etkili bir çevre eğitim aracıdır. Buradan yola çıkarak araştırmanın amacı, Libya'daki üniversite öğrencilerinin ekolojik ayak izi ve sürdürülebilir yaşam ile ilgili bilinç düzeylerinin belirlenmesini incelemektir.

Araştırmanın evreni, Libya'da 2016-2017 yılında eğitim ve öğrenim gören üniversite öğrencilerinden oluşmaktadır. Araştırmanın örneklemini ise aynı yılda eğitim gören 246'ı kız, 254'ü ise erkek olmak üzere toplam 500 öğrenci oluşturmaktadır.

Araştırma verileri, 2015-2016 eğitim ve öğretim yılında Libya'daki üniversitelerde eğitim gören öğrencilerin uygun oldukları zaman toplanmıştır. Araştırmacı veri toplama araçlarını doldururken üniversite oğrencilerinin yanlarında bulunmuş ve gerekli olabilecek tüm açıklamaları yapmıştır. Araştırma verileri SPSS-20 (Statistical Package for the Social Sciences) paket programı kullanılarak analiz edilmiştir. Verilerin çözümlenmesinde, istatistiklerin incelenmesinde T-testi, ANOVA, Tukey Testi, Frekans testi, Descriptive test teknikleri kullanılmıştır.

Araştırmadan elde edilen sonuçlardan, Libya'daki üniversite öğrencilerinin ekolojik ayak izi ve sürdürülebilir yaşam ile ilgili bilinç düzeylerinin orta düzeyde olduğu görülmüştür.

Anahtar Kelimeler: Ekolojik ayak izi, sürdürülebilir yaşam, çevre bilinci, çevre eğitimi.

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ABBREVIATION

SPSS: Statistical Package for the Social Sciences

X: Arithmetic Average

N: Number of People

(%): Percentage

t: t value for T-test

p: Level of Significance

f: Frequency

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CHAPTER I
INTRODUCTION

This section consists of titles of problem statement, problem phrase, aim of the research, importance of the research, premises of the research, limitations of research and definitions.

1.1. Problem Statement

All parts forming the universe in the system where the universe operates perfectly are linked to each other by an enormous balance. The most important factor in human life, who is one of these parts forming the universe, is the balance factor. Undoubtedly, the most powerful part of this balance is a natural balance developing automatically between human and the environment. As the systems bringing together the natural balance are linked to each other with long relationships, any harm that may occur in any ring of the chain affects the entire chain and deteriorates the balance, and such situation causes environmental problems to emerge. Efforts of people to deteriorate the natural balance and dominate it have caused break the chain and so it has put the environment in a deterioration process.

The environmental problems emerging in a different way in the process of experiencing production and consumption processes impairing the natural balance have become a problem threating the existence of all living creatures as well as the environment. These problems experienced by both people and environment are linked to so many factors and processes like population growth, unconscious usage of natural resources, deterioration of wild life habitat, extinction of many plants and animals, natural dangers, urbanization and difference in wealth among countries (Bozkurt, 2010).

As it is known, people have survived with the environment in peace for a very long period of human history. The wastes also that were produced by human being who lived as hunter in the first period without causing any environmental problems were transformed to be harmless to the environment within its own circle and so no environmental problems were caused. People began to use the environment effectively upon the transition into agricultural community. Especially, people who adopted a sedentary life in very productive and well-watered areas used the environment in agriculture and tended to accumulate the wastes in certain places. People who used the environment constrictedly in previous periods with the transition to industrial

community had to use more of the environment in order to meet the increasing raw material and energy needs (Bozkurt, 2010).

The factories replaced the local production in agricultural communities with the industrialization process, and the increased fabrication caused an increase in level from rural areas to urban area. The improved industry, rapidly growing world population and accordingly urbanization and having better life conditions caused people to use excessively and unconsciousnessly and energy production and the natural sources consumption. Consequently, the world has become in such a position that it cannot roll back its presence of natural resources, in other words, it cannot renew itself (Yıldız, Sipahioğlu and Yılmaz, 2008).

Overcoming biophysical boundaries may lead natural balance and the systems forming the basis of economy to be impaired. So, this may be difficult to reach a certain life quality in future and to lead such life. However, complex structure of natural systems makes it difficult to determine at which point life style goes away from sustainability in connection with a certain consumption level. Ecological footprint is an indicator measuring ecological sustainability in a certain category within the framework of narrow definition of natural services that are benefited. This conception that was developed by Mathis Wackernagel and William Rees at the beginning of 1990s, is defined in terms of biodegradable productive area needed for meeting the production of natural resources including agriculture, stock farming, fishery industry and forest products and the demands like the region where CO_2 absorption and infrastructure that will be installed on it. We can reduce damages that we give to the environment by learning about our ecological footprint. Ecological footprint consists of different consumption categories that are food, sheltering, transportation, energy, consumption goods and services (Wackernagel and Rees, 1996).

Environmental awareness and sensitivity should be developed in order that people could sustain their life in a healthier and safer environment. The objective of a quality environmental education is to develop environmental awareness and sensitivity of individuals from every segment of society. Individuals should be taught from early ages about environmental education, environmental knowledge and sensitivity. Individuals should be trained to be environmental-friendly as of their primary education even pre-school period in order to ensure the protection of environment. In this way, as

improvements like rapid exhaustion in non-renewable resources and unceasing expectations of mankind that will disquiet people, destruction and deterioration in renewable resources as well as noise and aesthetic deterioration reduce, the speed of sustainable development and renewable energy will increase (Öztürk, 2010 transferring from DPÖ).

Teachers who are one of the most important factors of training individuals sensitive to environment and aware of environmental problems, have important role in raising individuals. The fact that students educating future's adults are aware of the environment, environmental problems, ecology, sustainability and ecological footprint matters will make individuals that they raise be aware of such matters too. In this study, the opinions of Libyan university students regarding their consciousness levels on ecological footprint and sustainable life were investigated and evaluated.

1.2. Problem Sentences

What are the consciousness levels of Libyan university students on ecological footprint and sustainable life? Based on the phrase of this problem, the sub-problems of the study are as follows;

▪ Do the consciousness levels of Libyan university students on ecological footprint and sustainable life differ according to gender?

▪ Do the consciousness levels of Libyan university students on ecological footprint and sustainable life differ according to the population level of the area where they live?

▪ Do the consciousness levels of Libyan university students on ecological footprint and sustainable life differ according to monthly income level of their family?

▪ Do the consciousness levels of Libyan university students on ecological footprint and sustainable life differ according to the educational background of their parents?

▪ Do the consciousness levels of Libyan university students on ecological footprint and sustainable life differ according to their monthly income levels?

▪ What are the consciousness levels of Libyan university students on ecological footprint and sustainable life?

1.3. Purpose of Research

This study was carried out in order that consciousness levels of Libyan university students on ecological footprint and sustainable life could be determined and evaluated.

1.4. Significance of the Research

Another conception emerging with sustainability concept in the conducted studies for the environment is ecological footprint. Ecological footprint is a tool showing us how much of the nature we use and how much space we need to recycle those we consume through our consumption habits. Ecological footprint is the most popular analysis of the world measuring sustainability, but there are very few studies conducted so as to use ecological footprint applications in a supportive way for environmental education. When ecological footprint is investigated scientifically, it helps students to see the effects on environment as a whole through their problem solving and critical thinking skills. At the same time, it is an extremely influent educational tool in teaching students by integrating their learning in the classroom with social matters and personal preferences. Lack of education and insensitivity of people who have the most active role in ecosystem, where both viables and non-viables live, are the biggest factors in deterioration of the ecological balance and pollution of the environment. That is why people have important roles in protecting, not polluting and reclamation of the environment. Protection of the environment could only be ensured by raising awareness of general public, elimination of indifference to the environment and giving sufficient training on environment in this respect (Öztürk, 2010).

As ecological footprint is a tool showing the extent to which individuals are sensitive against the environment, it contributes to increase the sensitivity and development of environmental awareness of such individuals. There are very few comprehensive researches that were carried out before regarding the issue of integrating ecological footprint into educational process in order to make environmental education more effective. This research is expected to be one of the rare studies conducted in our country in respect of using ecological footprint as a tool in environmental education.

1.5. Hypotheses

- It is assumed that students will answer the measurement scales given to them sincerely and in an unbiased way.

- It is accepted that selected group for the research will represent the universe within the specified limits where they are taken to.

- There has been neither positive nor negative interaction among the participating students to the research during application process.

1.6. Limitations

Every research contains certain limitations. Limitations of this research;

- Sustainable life and ecological footprint subject

- 500 individuals in the exemplary group

- University students in Libya.

1.7. Definitions

The conceptions defined in this research were used in the following significations:

Ecological Footprint: It can be defined as the area where the sources that people or ecological society having a certain life quality and consumption habits are produced and the wastes emerging from the use of these sources are rendered harmless, and being productive in terms of ecology having certain borders (irrigable land, woodland, grassland, the area where the sea and carbon dioxide are absorbed) (Marin, 2004).

Sustainable Life: Ensuring the welfare and happiness of people is not possible by consuming too much and possessing more. That is why people should learn how to keep consumption level in a way to allocate a share for those living today and will live in future, and be happy and peaceful. The single way that all creatures could survive in future is to search for a sharing and living arrangement setting off this target and understanding of life. There should be a sustainable life in order to ensure that. It is a condition of life that all creatures on the biosphere are protected. It is to provide an opportunity to meet the needs of future generations and help them develop by creating a

balance between people and nature and not consuming all natural resources (Harris, 2000).

Sustainable Development: The conception of sustainable development can be described as making plan without consuming all natural resources and creating a balance between people and nature, without endangering development, life and needs for today and for the future by letting generations to meet their own needs and make development today and the futures (Harris, 2000).

Environment: The media consisted of organic and inorganic matters where all creatures of the world live and which both affects and is affected by creatures (Alım, 2006).

Environmental Education: It is a continuously learning process among disciplines which provide knowledge, ability, value and experience for solving environmental problems in order to let individuals develop susceptibility and awareness of their environment and leave it healthy and clean for the next generations by having them identify the values, attitudes and concepts regarding the environment (Vaughan, et al., 2003).

Environmental Awareness: Make awareness about the importance of environment and environmental problems (Pandey, 2006).

CHAPTER II
THEORETICAL FRAMEWORK

2.1. Definition of Environmental Education

The environment is a multi disciplinary place/atmosphere unit formed of both living and non-living factors (Kemp, 2003). Environment is a conception comprising all viable and non-viable creatures and all interactions among them. Even though we have scientific information and technology, we need the environment too much in order to live healthily in terms of air, water, food, sheltering and energy. As a result, we are each an inseparable part of the environment. Environmental science is an interdisciplinary field studying interaction between the systems arranging life on earth and human activities (Miller and Spoolman, 2009).

The environment is said to be the milieu where creatures live affecting in various types and they are affected by it too. The environment of a living creature is the place where it maintains all social, biological, cultural and economic activities and meets the needs of nourishment, reproduction and sheltering. The environment comprises all viable and non-viable creatures, the physical, chemical and biological factors which could affect them (Yıldız et al., 2008).

The environment is the integrity of systems comprising viable and non-viable elements. That the environment sustains its existence depends on the compliance between viable and non-viable factors. If there should be any outer intervention or by any of such factors, there emerge disturbances in the compliance mechanisms of the environment, which perform perfectly (Çimen, 2008).

The researchers define the five basic problems causing environmental problems as pointed out below;

- Population growth

- Use of unsustainable sources

- Poverty

- Attempts to manage nature unconsciously

- Excluding

In order to prevent, protect, develop and improve environmental problems, firstly it is necessary to question and change separately value judgments and viewpoints of individuals related to the environment. As a result that environmental problems have reached that point today, it is necessary to announce such problems to all masses and take necessary precautions. In order that people could reach the necessary consciousness level, the first and perhaps the only way is to bring up people who can bring awareness and sensitivity towards the environment. The only possible way to be able to reach this target is environmental education that will bring up citizens aware of the problems that the world faces and who can undertake the solution of problems voluntarily. For this reason, environmental education has a vital importance to fight problems (Kavruk, 2002).

Environmental education could be described as developing environmental awareness in all societies, providing permanent and positive behaviour changes towards the environment and protecting natural, historical, cultural, socio-ethic values, providing active participation and taking place in the solution of problems (ÇB, 2000).

Environmental education provides the increase in social susceptibility and interest, obtaining information necessary for the environmental protection, research of the methods necessary for the solution of environmental issues (Dresner & Blawner, 2006).

2.2. Environmental Education and Its Importance

Environment is the milieu where living creatures affect other viable or non-viable creatures and they are affected by as well (Alım, 2006). The environment of a living creature is the place where it maintains all biological, social, cultural and economic activities and meets the needs of nourishment, reproduction and sheltering that are the main principles of life (Yıldız, Sipahioğlu and Yılmaz, 2000). The environment is where notions of people and nature seem to be an inseperable intersect. These notions are the two main factors that need one another in fact, by all means, but which could completely exist without the presence of the other. These two factors have the position of both active and passive to another (Parlak, 2004).

Environmental education aims to develop sensitivity with regard to protecting and developing natural habitat, and change individuals' attitudes and behaviours in a positive way (Bilgi, 2008). The main objective is to improve sensitivity in relation to

environmental awareness, and protection of natural environment (Başal, 2003). Environmental education provides the increase in social susceptibility and interest, obtaining information necessary for environmental protection, research methods necessary for the solution of environmental issues (Dresner and Blawner, 2006).

Doğan (2000) makes an assessment about environmental education to be an eternal process in which individuals and societies acquire awareness of sustainable development through knowledge, values, abilities and experiences, and obtain the determination to take action in order to resolve the current and future environmental problems individually.

Considering the definitions of environmental education in general, while on the one hand, it is aimed to obtain the necessary cognition, perception and behaviour types towards environment with environmental activities, on the other hand, it is important in the processes of developing students' personality positively like experience, active participation, responsibility and takeing charge in. For this reason, environmetal education, beyond being a certain part and subject of general education systems, is taken as a quality of application with will and skills of living in harmony within the environment (Özdemir, 2007).

That the environment sustains its existence depends on the compliance between viable and non-viable factors. If there should be any outer intervention or by any of such factors, there emerge disturbances in the compliance mechanisms of the environment which perform perfectly (Çimen, 2008).

Human beings always struggles with the nature that he/she lives in by using technology and changes the environment in order to increse welfare level. The environmental problems that more powerfully threat the future of people every second emerge as a result of this struggle and changes. Just as people play an important role in the emergence of environmental problems, they have major tasks too in minimizing them. For this, environmental awareness should be provided to people from very young ages and so, they should be responsible individuals. This could only be ensured with an effective and efficient education, particularly environmental education (Alım, 2006).

Environmental education is an important process that shapes the attitudes and behaviours of individuals towards the viable and non-viable components in the environment, imposing them sustainable life consciousness and making them sensitive

towards the environment and well-aware individuals. Creating environmental awareness in individuals beyond creating awareness of the environment is an important step in environmental education. As a matter of fact, it may be insufficient to develop positive attitudes and behaviours about the environment, that having knowledge on environment (Erten, 2006).

Environmental education is not limited only to formal education, but it comprises general as well as lifetime educational activities that are included in non-formal education. Environmental education cares for occupation, age, socio-economic and cultural structures of individuals forming the society. Thus, environmental education provides individuals with certain ethical values regarding the environment and provides to protection of the productive and aesthetic values of the environment (Bülbül, 2007).

It is possible through environmental education to identify behaviour patterns and motivation of individuals that form the basis of the sustainable development and create positive attitude and appropriate behaviour patterns. Environmental education has a feature of uniting several scientific disciplines through such functions (Environmental Issues Foundation of Turkey, 1991).

2.3. Definition of Sustainability

Sustainability refers to the issue that cultural and economic activities of various natural systems and people all over the world who can adapt to the changes in environmental conditions and are protected (Miller&Spoolman, 2009).

The nature that has a certain balance has a self-renewable and self-repairable structure through its sources and systems. The most important aim of people last years who impair the balance of the nature by their consumption habits in recent years is to become a society living in a sustainable way environmentally.

The meaning of sustainability refers to the continuity without interruption. It means using the values carefully that future generations have right on them too as well as today's generation in terms of social, cultural and economic aspects. It is a quality that could be provided in all aspects: ecosystems, management, services, energy or transition into field, emotions, economic income, the whole life (Kayır, 2007).

According to Miller and Spoolman, while sustainable life is defined as meeting our own needs without impairing the assets of nature, it is explained as protecting natural capital (Miller&Spoolman, 2009).

Considering the components of sustainability, the most basic component is natural capital. The natural capital consists of natural resources and natural systems. Natural resources are necessary for the development of several materials as well as energy production for people. Natural resources are generally divided into two groups; renewable and non-renewable resources. On the other hand, natural systems include many interactive cycles particularly the cycles among resources and among living creatures. These components are demonstrated in Figure 1.
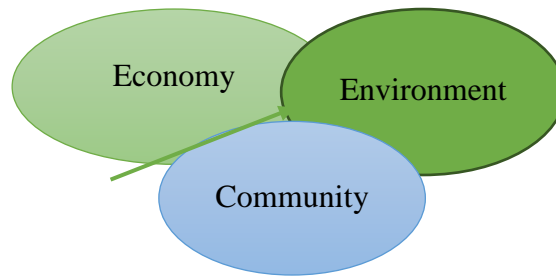
Figure 1. Sustainability and Its Components (Yeşil Kutu, 2010).

2.4. Sustainable Development

One of the conceptions having relation with sustainability conception is development. When the usage of natural resources of both developed and underdeveloped countries are examined in sustainability level, it can be seen that they are more consumer than developing and underdeveloped countries (Living Planet Report, 2008).

The conception of sustainable development emerged in 1970s and underlined that there should be a balance among economy, environment and society. According to the quotation of Keleş and Hamamcı (2005), this conception was firstly used in the report by "World Protection Strategy" which was prepared by the International Protection Association of Nature and Natural Resources (Keleş&Hamamcı, 2005). As this concept started to be widely used through Brutland report which was formed in the session named "Our Common Future" that was prepared by UN Environment and Development Commisson in 1987, the definition was mentioned to be: "The

development could become sustainable through the usage of today's resources without preventing the needs of future generations" (WCED, 1987).

Sustainable development should be provided in such a way that the development that we need of our day require will not eliminate the abilities of future generations to meet their needs (WCED, Brundtland Raporu, 1987).

2.5. Education for Sustainable Development

Education is a prior condition and good administration for sustainable development as well as being a human right and an effective tool for making decisions based on knowledge and developing democracy. Education on sustainable development allows our world to become more secure, healthy and prosperous by changing viewpoints of people, groups, communities, institutions and countries in favor of a sustainable development and so, it increases life quality of people. Education on sustainable development may provide possibilities such as critical thinking, necessary for uncovering new visions and concepts, new methods and improvement of tools, more awareness and more authorization (UNECE, 2003).

The vision of education on sustainable development underlines an interdisciplinary approach aiming at developing knowledge and ability that are necessary for not only sustainable future but also changing values, attitudes and life styles. So, this entails the re-arrangement of educational systems in order to ensure its application through appropriate ways in terms of cultural and local aspects and letting all types of people from young to old make decisions so as to eliminate the problems threatening our common future. In this way, people could be allowed to create and assess alternative visions and put into practice such visions by working on others for providing a better future (Keleş, 2007, adopted from UNESCO).

Martin and Jucker (2003) stressed in the conference "the role of universities in shaping our international sustainability future" that it is necessary for universities to put on to the agenda the duties to be carried out in their curriculum regarding sustainability. This conference is the most important contribution of the universities for sustainability agenda. However; it is the least improved subject. There are many reasons for such a decrease. Education for sustainable development is improved as a process keeping one another through holistic approach towards sustainable development. The origin of this

education goes to interdisciplinary issues like environmental education, development of education and citizenship education (Sterling, 2001)

It was stressed on the necessity of developing processes providing global, regional, national and local environmental problems to be understood; using different educational methods oriented to participant, process and solution arranged appropriately for students, comprising traditional ones and debating on them, conceptual and perceptional mapping, questioning philosophically, setting forth values openly, imitation, scenario, taking models, playing roles, games, information and communication technology, researches, case studies, excursions, learning outside classroom, the projects conducted by students, good application analysis, work place experience and problem solving by focusing on environment which is shaped by mankind and natural environment through life cycle approach (UNECE, 2003).

Education of teachers has a big importance on developing value judgments and life styles that are necessary for sustainable development. There are major attempts made globally for the last ten years in order to increase training of teachers for sustainability. Environmental Education Attempt in Teacher Education in Europe, UNESCO Training for a Sustainable Environment: Learning and Teaching Activities for a Sustainable Future and Innovation Project in Teacher Education in Asia and Pacific are some examples. As a result of the assessments made after Learning and Teaching Activities for a Sustainable Future, it was detected that teachers underlined the importance of trainings for sustainable development by expressing that such programs would be very beneficial especially in in-service programs, there would be a good learning experience, that they should be integrated in different courses, that learning and its values would be a milestone for sustainable life (Keleş, 2007 adopted from UNESCO).

Education on science for a sustainable life requires the students to participate actively in forming processes and models for filling the gap between the real world and classroom. It is important that students work on sustainable life conditions in local scale. The instructors should activate and motivate continuously the schools in order that environmental problems are comprehended, realized and suggestions for solution are made (Herremans&Reid, 2002).

2.6. Ecological Footprint

Ecological footprint is a conception came into agenda together with sustainable life. We consume sources and produce wastes until the end of our lives. Every substance that is consumed and waste that is produced entails a certain amount of fertile soil and water. It is defined as water area and fertile soil ecological footprint necessary for absorbing the wastes we produce and provide the production of resources we consume (Schaller, 1999).

In other words, the conception of ecological footprint is one of the indicators of environmental sustainability which lets us demonstrate the effects of production and consumption activities of mankind on nature by quantitative data. It can be defined as the area where the sources that individuals having a certain life quality and consumption habits are produced and the wastes are rendered harmless, and being productive in terms of ecology having certain borders (irrigable land, woodland, grassland, the area where the sea and carbon dioxide are absorbed) (Keleş, 2011 adopted from Wackernagel and Rees).

This conception was firstly presented to the science world as an analysis of sustainability by Dr. Mathis Wackernagel and his colleague Prof. Dr. William Rees in 1990s (Venetoulis and Talberth, 2008). These scientists developed a new calculating method and technique bringing solution to the current situation and preventing limitless source consumption, measuring productivity and source amounts of natural resources that are not spoiled (Akıllı et al., 2008).

Akıllı et al., (2008) defined ecological footprint as "Footprint which is an inspiration for the conception is a trace whose depth depends on the pressure into the ground due to the weight and foot size of a creature. The pressure that creatures cause on the planet and amount of using biological productive area are symbolized by footprint conception.

Keleş (2007) defined ecological footprint as specifying the surface area of the land that is necessary for "procuring food, producing resources, producing energy, eliminating waste and re-absorbing carbon dioxide that fuels cause by photosynthesis".

According to Keleş (2007), ecological footprint is a calculation tool allowing us to measure and understand how much we make use of the nature and how much of it we

possess. We can reduce the effects we cause on nature by learning the size of our ecological footprint. Ecological footprint consists of different people's consumption categories transformed into fertile land that should produce and absorb such effects. There are food, sheltering, transportation, energy, consumption goods and services among such services.

2.6.1. Importance of Ecological Footprint

Ecological footprint is the measurement of bio-productive land and water amounts that are necessary for the wastes produced by production and consumption activities of people to be absorbed (Kitzes & Wackernagel, 2009).

The analysis of ecological footprint measures the effects of human activities to the nature by asking the question, how much of the nature do we use relatively to the nature we have?" which is the basic principle of sustainable development (Keleş, 2011 transferring from Bond). The analysis of ecological footprint provides a "control list of ecological facts" that leads us to question our experience by asking ourselves the question "What can I do today for a more sustainable life style within the capacity of the world while developing my life quality?" (Keleş, 2011 adopted from Wilson and Anielski).

Ecological footprint specifies the surface area of the land that is necessary for procuring food, producing resources, producing energy, eliminating waste and re-absorbing carbon dioxide that fuels cause by photosynthesis. Ecological balance is calculated taking into consideration basic human needs (food, material, energy production (demand), absorbing wastes (supply), etc.). Basic ecosystem categories of nature for ecological footprint calculation are as follows; sea area, arable land, rural area, forestland which is necessary for absorbing CO_2 input-outputs and construction area (Keleş, 2007 adopted from Wilson and Anielski).

Ecological footprint can be used,

- As an indicator of a sustainable development,

- To see what changes the alteration in human activities and consumption habits create in the environment,

- To make a relationship between global footprints and local activities (Wackernagel and Yount, 2000).

When ecological footprint is investigated scientifically, it helps students to see the effects on environment through their problem solving and critical thinking skills. At the same time, it is an effective educational tool in integrating the knowledge that students learn in the classroom with social issues and individual preferences (Keleş, 2007 adopted from Abellera).

2.6.2. Ecological Footprint of World's Countries

According to Living Planet Report 2014, no country has yet succeeded to reach a globally sustainable footprint in conjunction with high human development. According to the report, the top 25 countries in ecological footprint per capita are as follows: 1.Kuwait; 2.Qatar; United Arab Emirates; 4.Danemark; 5.Belgium; 6.Trinidad and Tobago; 7.Singapore; 8. United States of America; 9.Bahrain; 10.Sweden; 11.Canada; 12.Holland; 13.Australia; 14.Ireland; 15.Finland; 16.Uruguay; 17.Austria; 18. Switzerland; 19.Czech Republic; 20.Estonia; 21.Oman; 22.Mongolia; 23. France; 24.Slovenia; Germany.

Two points determine the greatness and components of ecological footprint per capita in a country: The goods and services that average people who live in that country use and the productivity of the resources that are used for the procurement of such goods and services including fossil fuels. It is not surprising that most of the 25 countries that have the biggest ecological footprint per capita have high income level and they nearly all have the biggest footprint component as carbon (WWF, 2014).

The contribution of each country to global ecological limit excess is different. For example, if the rest individuals of the world had the same footprint as an average individual in Qatar, we would need 4,8 planets to live. If we should live the same style like an average American individual, then we would need 3,9 planets. While these figures are respectively 2 or 2,5 planets for average people living in Slovakia and South Korea, they would be 1,4 for South Africa and 1,5 for Argentina (WWF, 2014).

According to Living Planet Report 2014, while countries with low incomes have the lowest footprint, they are the ones mostly suffer from ecosystem loss. For a period more than half of a century, while footprint per capita in most of the countries having

high income level are over per capita biological capacity in the world, they go on their lives being depended mostly on resources of other countries. On the other hand, much smaller increases were experienced in countries with medium and low incomes having smaller footprint relatively in the same period (WWF, 2014).

2.7. Ecological Footprint and Effects on Environment

According to Living Planet Index, wild species and natural ecosystems are under threat in all regions of the world. Anthropogenic factors that influence biodiversity directly can be grouped under five headings.

1. Changing of natural environment especially due to agriculture

2. Irregular treatment on species, especially in fishing and hunting

3. Pollution

4. Disintegration of dominant species or genes

5. Climate change

The natural habitats are lost, changed or scattered for stock farming, agriculture and industrial use. The river systems are damaged or changed for the purpose of hydro energy, storage and arrangement. Besides that, naval ecosystems are damaged by excursions, trawel and industry.

Besides the animals disappeared as a result of the destruction of animals excessively and unsystematically, animals that are at higher in the food chain are also damaged. This is the most important threat for biodiversity in water. As well as exploiting animals that way, the plants are also destroyed disorganizedly. Excessive tree cutting for supplying wood both destructs forests and gives serious damages to the ecosystem of animals.

Dominant species move from one place of the world to another for other reasons intentionally, and this makes them to be either hunters or parasites in their new environments. Dominant species damage local ecosystem in new living spaces. This is an exclusively serious problem on islands and fresh water surroundings.

One of the major factors causing biodiversity to disappear is pollution. The wastes providing excessive nourishment for creatures in some environments cause the

increase in fertilization of phosphorus is agriculture and more usage of nitrogen. Consequently, this causes the consumption of oxygen. Toxic chemical pollution realizes due to pesticides that are used in agriculture, industrial and mining wastes. Increase in carbon dioxide concentration in the atmosphere increases the acidification of sea water and widely damages ecosystem in the water.

It is the climate change that is possibly the most harmful to biodiversity among the headings we mentioned. The first floatation of the effects of climate change has already been seen in the poles and shores. It is difficult to envisice the future effects in certain areas but the results that temperature and climate change will bring will be important.

The reason of all these effects is mankind. As population, energy needs and nutrition needs of mankind increases, the pressure of such effects on biodiversity will increase respectively. However, this pressure may be decreased as technology and the efficiency in production improve. Ecological footprint is the overall of the demand on species and ecosystem. Understanding the interaction between biodiversity and footprint of humanity will slow down the collapse of natural ecosystems and wild life.

Humanity depends on a healthy ecosystem: This healthy ecosystem helps and supports us to sustain a quality life, living becomes difficult without it. Millennium Ecosystem Community (MA) groups the studies that should be done under four main categories.

- Food chain, formation of soil and main productions

- Food, freshwater, material and fuel, and so on production

- Arranging the climate, cleaning the water, controlling the pollution

- Studies of trainings

These studies are all directed to ecosystem. Even if it seems that they are not structures conducted against the collapse of species directly, they will form the basis of biodiversity.

2.8. Strengths and Weaknesses of Ecological Footprint Analysis

Ecological footprint has both advantages and disadvangatges, and it needs methodological development. In spite of these difficulties, Mathis Wachernagel (one of

the creators of footprint) stated that footprint estimations are cautious, because people do not reflect the whole demands in goods and services of nature (for example ecosystem services like destruction of wastes). A new tool is provided for the transmission of footprint sustainability, and it hepls houses and decision makers. Table 2 demonstrates the related strengths and weaknesses of ecological footprint through local or municipality level applications specified by European footprint implementers (Wilson&Anielski, 2005).

Table 1

Strengths and Weaknesses of Ecological Footprint Analysis

Strengths	Weaknesses
There are so many people interested in ecological footprint calculation. The methodological approach is increasingly being recognized and today researches are being carried out for developing a common method.	It is not certain yet what the wide application area of ecological footprint will be.
Ecological footprint has the capacity to address to individuals as much as politics and environmental administrators. It can be used in all levels and sectors.	Consumption of energy is increasingly becoming a more important peak for the society, however, ecological footprint does not refer to certain decisions about energy and policy changes in this field.
Ecological footprint is a sustainable development indicator not only showing us what the demand is but also showing us which directions we should follow.	The conception of ecological footprint does not focus on the possibilities on local level. This is a result of not reaching local data.
There are problems in reaching the necessary data for calculation as well as methodological problems, but the researches in these fields are ongoing.	It is deprived of many important dimensions of sustainable development perspective. Ecological footprint does not include socio-economic aspects like poverty issue.
That WWF adopted ecological footprint during ecological footprint calculation of Nations empowers the approach.	Calculations of ecological footprint are complex.
Ecological footprint exemplifies change strategies and consequently the change potential with various efforts by providing key components of ecological footprint consumption.	Finding and collecting data may be burdensome.
	Environmental quality and deterioration are not handled in the approach.
	Based on the current calculation method, rich countries made positive

	"national ecological deficit" (when national ecological footprint is compared with the current national bio-capacity), whereas poor southern countries made negative "national ecological deficit".

Wilson&Anielski, 2005.

2.9. Ecological Footprint of Libya

Libyan Arab Jamahiriya occupied 182.4 million hectares of land and sea, including 16.0 million hectares of productive area in 2006. Of this, 217,000 hectares were forest, 2.1 million hectares were cropland, 13.5 million hectares were grazing land, and 234,000 hectares were covered by built infrastructure. Bordering the Mediterranean Sea, Libya has 6.4 million hectares of continental shelf (Tracking the Ecological Trends Shaping the Future of the Mediterranean Region, 2010).

Libya's cropland, grazing, forest, and fishery yields were all lower than the global average, leading to a total biocapacity of 9.5 million global hectares (gha). This was lower than Libya's Ecological Footprint of consumption of 19.2 million gha. Libya has been running an ecological deficit since the end of the 1980s in part, because of its ability to use oil revenue to import resources. Libya's Ecological Footprint of production, less the carbon Footprint, of 3.9 million gha was less than local biocapacity in 2006. This indicates that in 2006, in aggregate, Libya may not have extracted more from its ecosystems than the ecosystems themselves could renew, since some of their demand was covered by ecosystem services from outside Libya (Tracking the Ecological Trends Shaping the Future of the Mediterranean Region, 2010).

In 2006, Libya's average Ecological Footprint per capita was 3.2 gha, larger than the global average Footprint per capita and the global average available biocapacity per capita, indicates that the consumption of Libya was not globally replicable in a sustainable manner (Tracking the Ecological Trends Shaping the Future of the Mediterranean Region, 2010).
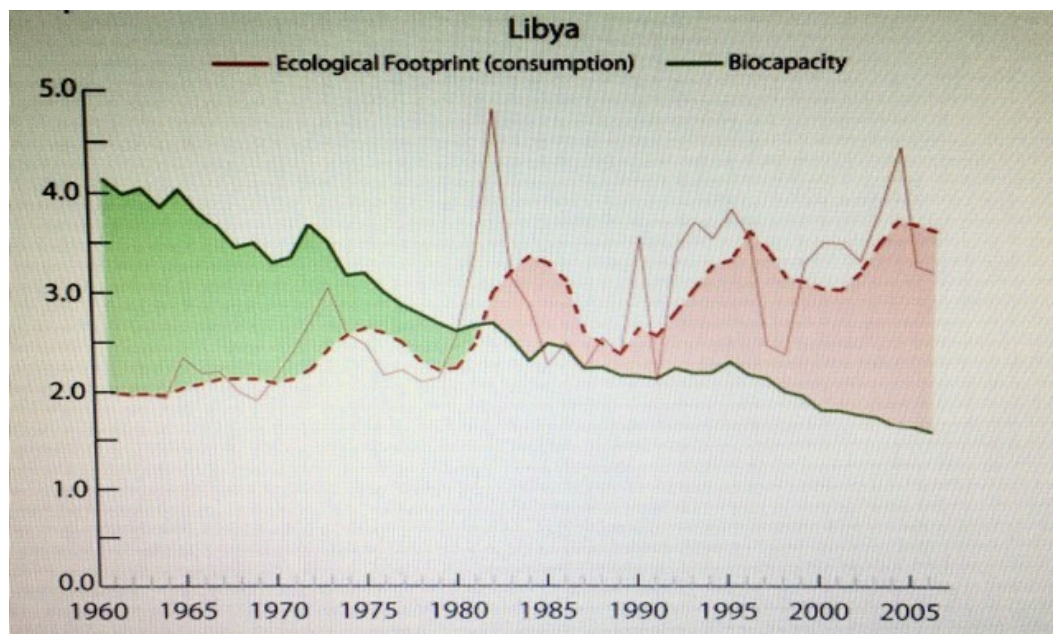
Figure 2. Libya's Ecological Footprint and Biocapacity Per Capita over Time.

2.10. Ecological Footprint and Global Sustainability

Global sustainability entails human activities to stay inside payload of the nature. When we divide the whole fertile land and sea spaces of the planet biologically into the number of people living on the earth, we obtain the value of 1.9 hectares per capita. On the contrary, global footprint per capita is 2.3 hectares, thus footprint of mankind could exceed load capacity of the world in a rate of 21%. Global hectare is a scale used for measuring ecological footprint. A global hectare is equal to a hectare which is a biologically fertile area according to equal world average efficiency. This provides all ecological footprints to be measured and explained in consistent units. This, at the same time, approves that our ecologic effects are formed in remote spaces and as a result, affects the efficiency of the natural capitals of such places whatever the land productivity of our near vicinity is (Wilson and Anielski, 2005).

An average usable global bio-capacity represents 26% of the necessity, one for reserving a typical Canada footprint (7.25 ha/per capita). If we consider biodiversity and the need to protect the living area of species, we can see that less bio-capacity is left for people. Life style of an average Canadian is not sustainable with a 7.25 hectares footprint per capita for instance, because it uses 382% of worldwide usable bio-capacity in global scale. Even if Canada itself has more fertile soil and sea areas biologically, life style of people in Canada has finally an ecological deficit in other communities in the

world. Ecological footprint underlines global inequalities in this way (Wilson and Anielski, 2005).

A big footprint means excessing the global payload of the World and that we are consuming the nature in a globally unsustainable rate. For example, while financial possibilities of wealthy people are enough for greater houses out of town, which requires long distance transportation, they could live in their town houses near their works, which reduces their material, transportation and related energy expenses. However, it is a matter of flexibility reducing ecological footprint of many people in consumption model. Locally produced food, organic producted vegetables, developed insulation, bicycle, public transport vehicles and so on factors cause to emerge smaller ecological footprints per dollar spent in comparison with alternatives used generally (Living Planet Report, 2006).

The growth in world economy will continue to be a factor mostly affecting the environment in future as it does today. As global economy increases, the stress on world's natural system and resources increases too. The greatness of population in developing countries and natural resource usage (for example, destruction of forests by poor people in order to sustain their life) emerging from it have much more important place in total environmental effect. On the other hand, resource use per capita and the wastes emerging from it have higher weight on total environmental effect. Although population in developed countries shows relatively slower development high consumption use per capita resulted from high life standards and influential use of technology may affect the environment more deeply (Marin, 2004).

2.11. What Could Be Done to Reduce Ecological Footprint?

We should diminish our ecological footprint for a sustainable future of our world. The way of diminishing ecological footprint is to take precautions like having conscious consumption habits, using our own resources instead of using outer ones and not being extravagant while using energy (Yeşil Kutu, 2007).

Selection of life styles like voyage type (like walking, cycling, using public transports instead of own car) or where we do shopping from (like local markets or buying from bazaar) and what we buy (like organic products instead of non-organic products) and usage of natural resources like energy more efficiently could be reduced.

We need to select better management and protection of our ecological assets just like we administer our infrastructure and other produced capital assets (Yeşil Kutu, 2007).

There are many ways that we could apply individually in order to reduce our own footprint. Some of them are stated below:

• Driving less,

• Walking, cycling, sharing the same car with others or using public transports,

• Using more local products that are produced organically,

• Applying last technological improvements or researching renewable energy sources in order to make energy use of houses and workplaces more efficient,

• Taking "green" energy from local power plants, using renewable energy sources,

• Buying cars consuming less fuel or polluting less

• Selecting a house which is near to workplace (Wilson and Anielski, 2005),

• Reducing the consumption of animal nourishment (Palmer, 1998).

The average of food in the world is 0.9 hectare per capita or 35% of the total footprint. For this reason, behaviours such as preferring vegetable food instead of animal food, keeping away from hunting species in danger of extinction or in an uncontrolled way, procuring and planting regional food, and growing crops without using pesticides would be helpful in reducing ecological footprint. In addition, the food that we buy as consumers should be nutritive, natural, unpackaged, grown locally, and consuming the food produced in timely manner are among the issues that should be considered in reducing ecological footprint. The transportation is 0.3 in global hectare per capita, and it is about 11%. The options like limiting the excessive use of aircrafts and vehicles, using vehicles more slowly, prefering private cars when traveling with more people would be helpful in reducing ecological footprint in terms of transportation. Domestic fossil fuels constitute 12% of World's ecological footprint. Unifying energy consumption and using alternative energy sources as much as possible will prevent the growth of footprint (Yamada, 1999).

There are some designs that we should adopt globally apart from our individual responsibilities in order to reduce ecological footprint and develop more sustainable life styles.

Let's imagine a world where everything that we do, use and consume is nutritional source, the growth is a good thing and things that people do result in good and constructive ecological footprints. Destructive qualities of from cradle to grave system of today in the direction of sustainable development are not inevitable results of consumption and economic activities, but they may be a result of the problems of main design. It really may transform the production and consumption of objects, a plan with principles and based on the laws of nature. This design conception which is called as from cradle to grave forms a model for positive human designs. In this context, we can create economies refining the air, soil and water; benefiting from sunlight; not producing any toxic waste; providing continuous recycling; using safe and healthy materials; offering benefits that could enrich the whole life (TEMA, 2004).

2.12. Related Literature Studies

Wackernagel&Yount, (2000) provide in their study "Footprint for sustainability: New steps" a simple outline for both national and global capital account. In this outline, consumption made by people and natural capital production based on ecological footprint conception in national and global levels are compared. This study was applied in 52 countries by using Italy as a sample. As a result of the study, calculation of ecological footprint demonstrated with ecological terms the real photograph of our positions among 52 countries. The calculation we made is the starting point for more flawless national and regional ecological flows and services. It was mentioned that ecological footprint could be an easy and legible measurement tool for ecological sustainability.

Vuuren&Smeets, (2000) debated in their study the actual potential and limitations of ecological footprint as an indicator of sustainable development by applying ecological footprint concept in 1980, 1987, and 1994 in Benin, Bhutan, Costa Rica and The Netherlands. Even though the total usage of land per capita are different in all four countries, the research results reveal that the total usage of land increases, while usage of land per capita in four countries decreases according to the data obtained. Ecological footprint for carbon dioxide increases in four countries in terms of

both per capita and absolute level. In spite of some hindrances, it was concluded in the research that ecological footprint formed an interesting platform in terms of equality debates in using sources and environmental effects of consumption designs including overseas.

Venetoulis, (2001) reminded in his study that teachers, researcher and activists in faculty or university campuses have stridden out for making green places since environmental movement began. He added that such efforts could continue as they could be effective, and sometimes the questions arising outstandingly about sustainability could not be answered. The answers of these questions are given in this research. The question "What is the ecological effect of Redland University?" was answered by the technique named analysis of developed ecological footprint lately. The outputs of ecological footprint used here is partial ecological footprint of Redland University. Ecological footprint of the university was evaluated through approaches having different theoretical viewpoints.

Gayford, (2002) aimed at the question of environmental literacy training as a part of the professional development program of a group of secondary school science teachers in United Kingdom. The teachers investigated the ways of contributing to sustainable development training as well as protecting and developing the integrity of their own disciplinary issues by using action research approach. A knowledge and ability based model having a hierarchical structure was suggested for explaining how to contribute to general environmental literacy of science students. The approach used here in final assessment of learning experience by the teachers demonstrated that it helps them to address to their own needs, regarding particularly the analysis of pedagogy.

The objective of the study named "National Survey of High School Students' Environmental Knowledge: Level of Knowledge and Variables" is to evaluate environmental knowledge of high school students. The distribution of environmental knowledge was investigated in terms of many factors (gender, education). Environmental knowledge of the 10th and the 12th grade students was evaluated by seven questions of a questionnaire study. The analysis results demonstrated that the students have a little knowledge. At the end of the research, it was detected that most of the students remembered the fundamental facts about environmental problems, but they could not consult their knowledge in searching for solutions for such problems or

understanding the results. At the same time, it was ascertained that variation on their environmental knowledge from the 10th to the 12th grade showed very little increase. It was observed that education at family level (in favor of males as gender) and the quality of high school science courses are vitally impressive on environmental knowledge of the students (Gabro and Switzky, 1994).

Anderle, (2002) mentioned about three concepts that individuals implement on their own for sustainability. These conceptions are natural steps, assessment of individual life circle and ecological footprint. Natural steps ensure a core and understanding against sustainable development. Life circle helps to create a frame for assessment of sustainability. Calculation of ecological footprint determines the measurement of living creatures and qualitative decisions through natural steps and life circle. It was suggested that basic footprint calculations just like domestic footprint calculation was developed to determine objectives for avoidance of individuals and communities from excessive consumption for a sustainable life.

Wright&Drossman, (2002) used a piece based method to determine ecological footprint of Colorado University capmus. This method calculates different aspects of special, individual, institutional and regional environmental effect. The 2001 ecological footprint analysis of Colorado University was limited to seven great factors in terms of data and insufficiency of time. These are the fields of electricity usage, consumption of natural gas and fuel transfer, water support, food consumption and used areas. It was concluded at the end of the studies that the electricity used formed the biggest footprint, and then respectively came natural gas, transportation, water and food. As the contents of wastes were not known completely, ecological footprint could not be calculated for solid wastes. The analysis results revealed that the university should focus on reducing electricity usage.

Warburton, (2003) examined debates and factors encouraging students and environmental instructors to use profound learning strategies in some ways and the effect of profound learning in his study. Profound learning is key strategy in understanding from materials used in the course and experiences whose meaning is set forth by students. Profound learning is especially related to training for sustainability due to arrangement and interconnection of environmental, social and economic issues and interdisciplinary thinking and holistic understanding. It was concluded that such

strategies are useful for developing sustainability for creative interdisciplinary approaches beyond the institutions and for ensuring maximum benefit to environment courses.

Çabuk&Karacaoğlu, (2003) aimed to determine opinions of university students about environmental sensitivity in the study "Investigating Environmental Sensitivity of University Students". It was investigated whether certain individual features of students (gender, age, their grades and programs) create any difference in their opinions about environmental sensitivity or not and a 24 question survey was applied. At the end of the study, it was discovered that training on air, water and soil pollution is not provided sufficiently, and there was a significant difference between environmental sensitivity of the students according to certain individual features.

Erten, (2003) conducted a research on whether there was a consistent relationship among the knowledge, attitudes and behaviours of the students about reducing garbage by determining them. It was detected that negative attitudes of students against the environment turn on to be positive by a course plan which was developed at the end of the research, their environmental awareness increase and there were inconsistencies among their environmental knowledge, attitudes and behaviours.

Rees, (2003) discussed sustainable development conception as well as ecological footprint and its several calculation methods in the study "Preventing Sustainability? Ecological Footprint of Higher Education". He added that there were several problems preventing academic world to lead sustainable development. These problems were stated as follows; 1) modern curriculum programs define humans and nature as rivals but not partners, 2) changing belief and values make human more competitive and egoist, and as a result; the nature is perceived in a perspective to be more mechanic by higher education society. 3) As universities implement projects with the help of the business world, they are degraded against global companies to be negative and lost their intellectual leadership. 4) As the connections of academic disciplines reduce, they also have lose their perspective of perceiving the nature as a whole. Rees stated that higher education should solve the problems stated above firstly in order to lead sustainable development.

Meyer, (2004) aimed to support individuals studying to get an international diploma on environmental management and water protection issues by using ecological

footprint as educational tool. At the same time, he helped these individuals to understand the ecological effects of their behaviours both in national and international fertile lands. A single group pre-test and post-test model was used in the research. It was concluded that ecological footprint analysis that is used as environmental education tool increases awareness of individuals positively regarding sustainable life, develops their attitudes positively and reasonably, and it is influent in making them have responsible behaviours towards sustainable life.

Once the related literature is reviewed, it was seen that ecological footprint is used as an educational tool in capacity of environmental education tool intended for sustainable life in overseas primary, secondary school and university level, and many researches are conducted. Even though there are few researches about sustainable life in our country, any research in which ecological footprint is used as educational tool in environmental education, has not been done. Considering teachers playing the key role in developing value judgments and life styles that are necessary for sustainable development, teacher candidates should be trained on such issues in our country too. This research named "Using and Evaluating Ecological Footprint as Environmental Education Tool for Sustainable Life" is important in terms of literature as it is one of the rare studies made on this issue in the country.

McMillan et al., (2004) evaluated the effect of the classes conducting studies on university level at environmental values of the students in the study named "The Effect of Environment Class on the Values of Student Conducting Students at University Level". The interviews and surveys were used to identify whether values of the students taking this course changed or not. Three-phase structured interviews were carried on for a whole academic year. The questionnaires were applied as pre-test and post-test at the end of on eight month study. It was observed that the students deepened environmental values after taking these courses. It was pointed out that they became environment-centered from being human-centered. It was seen that ecological footprint test and the video they watched had the greatest effect in variation of students' values.

Dawe et al., (2004) supervised the sustainability of Holme Lacy faculty in their research. By comparing many key conceptions, "Triple Baseline" approach (evaluation of social and economic effect and ecological footprint calculation based on environmental effect assessment for observation, revising and simplifying) was adopted.

The footprint of the faculty was seen to be 296 global hectares and specified to emit 866 ton of carbon dioxide gas to the nature in a year. In the light of such information, it was determined that the faculty had many unsustainable features.

Mcdonald&Patterson, (2004) calculated ecological footprint of 16 regions of New Zeland after the output and input method was extended by Bicknell et al., upon researching ecological footprint in this study. Auckland region became an important focal point for case study. Auckland was specified to be the region having the biggest ecological footprint with 20% (2,32 million hectares) of New Zealand ecological footprint. At the same time, application and theories of ecological footprint were reexamined and ecological footprint calculation was tried to be determined by applying different methods in this study.

Moore, (2005) made seven suggestions to the universities that they could use while planning educational programs for sustainable development. These recommendations are not special for curriculum or programs, yet they make certain recommendations to academic institutes about "sustainability training". The objective of this research is thought on possible aspects for the future of sustainability training at university level. Numerous workshop studies were conducted in the outline of "value-oriented thinking". The suggestions were collected by unifying the ideas of 30 participants that were interviewed in British Columbia University and from workshops. These suggestions are set forth as; all decisions of universities will be inspired by sustainability, it is necessary to improve and apply cooperation, interdisciplinary exchanges could be done and it should focuse on both individual and social sustainability.

Qablan, (2005) aimed in, the research conducted, to define the factors influencing education on sustainable development in American universities. In analyzing training activity for sustainable development, Cultural Historical Activity Theory was used from a theoretical point of view. The information consisted of a set of interviews, classroom observations and artifacts that were carried out by two university professors. The findings obtained demonstrated that activities of both professors for sustainable development faced many discrepancies. These discrepancies were both contextual and human centered and have caused professors to reshape the target of their teaching activities. There are the rules of the institutions where professors work on the

basis of contextual discrepancies, just like internal and external institutions and variation of the work in business environments. Thematic analysis of knowledge demonstrated that discrepancies regarding the content entail work responsibility, emphasize learning beyond research and arise from the lack of institutions thinking on general and special education for sustainable development. Personal discrepancies come out from individual philosophies, viewpoints and sustainable development visions of professors. One of the professors protecting environmental knowledge and the other protecting both sustainability and environmental knowledge focused on the purpose and changed and extended teaching activities. It was suggested that some strategies at the end of this study like encouraging and rewarding structures for the faculty and institutions offering education for sustainable development inside the universities, focused on contextual discrepancies.

Zhao et el., (2005) sought to demonstrate different ways of ecological footprint calculation emphasizing that we need new disciplines forming a bridge between man and nature, we have become more depended on economic and ecological support systems. This new method starts by calculating ecological footprint of payload and energy flow of the system. Energy flow of the system transformed into biological efficiency units by using emergy (difference between two energy levels) during energy flow study. Gansu region of West China was selected in order to show the mechanics of the new method. It was seen that Gansu province proceeded towards ecological openness.

Ryu, (2005) stated in his study the factors forming ecological footprint per capita of viable species in Dallas of Texas province. The main hypothesis is to estimate the demography, environmental values, space features and soil usage samples surrounding people, which are important factors of ecological footprint greatness per capita. In this research, ecological footprint of participants were determined by the use of ecological footprint questionnaire consisted of 16 questions regarding individual food, transportation, shelter and consumption of goods / services. Survey model and GIS (Geographic Information Systems) were used in the research. GIS technologies were used in measurement of space features objectively. Environmental values were measured by the questions selected for ecological crisis. In this study, individual ecological footprint of Dallas region was found to be 26.4 acres (1 acre = 0.405 ha): food (5.1), transportation (3.3), sheltering (8.3) and consumption of food (9.8). It was

also determined that local people living in that region need 105 times for the soil produced ecologically more than the regions in the city. Furthermore, it was observed at the end of the study that old men having good salaries, highly trained, single and living in the regions where population density is low in domestic consumption have more individual consumption footprint. It was ascertained that people who live far from grand residential areas and where the rate of job opportunities is low and there is less environmental awareness but near big shopping malls have more individual consumption footprint. It was concluded that young individuals who live near big shopping malls but far from Dallas/Fort Worth airport have more transportation footprint, old and highly trained individuals living in highly developed regions have more sheltering footprint, and old and single men having good salaries and living in the regions having low population density have more food footprint.

Owens, (2005) stadied the environmental values of children coming from four different environments in his study named "Judgments of Children on Environment at First Years of Primary School" by using other tools in conjunction with mind map. It was found that the number of features children made interpretations on environmental values is related with their age. It was pointed out that environmental features and experiences appreciated by children emphasize the importance of teaching activities carried out outside and first hand experience. It was observed that teaching process is more effective in cases when teachers are the models of values. It was also observed that children who are more motivated and in interaction with their environment formed the students mostly participating in learning.

Wehrmeyer&Chenoweth, (2006) investigated whether one-time short-term adult education except for the training given to students who continue their university studies are more effective or not in comprehending and expanding education for sustainable development. Pre-test and post-test surveys were prepared and used in order to investigate the efficiency of a series of short-term courses about the environment and the studies conducted about sustainability issues by environmental strategy center on behalf of England. It was observed that it is effective in increasing awareness level in comprehending sustainability issues in long-term courses as well as short-term courses and awareness level about such issues. The learning about sustainable development was at maximum level compared to previous learning experiences, and facilitated both the knowledge of participants and arguments on forming the basis of participants'

knowledge. It was concluded that helping the efficiency of short term courses to increase has a critical importance in expanding sustainable development and sustainable development training at higher education.

Ramirez, (2006), in his study, used web supported questionnaires over Internet in order to determine how to include environmental sustainability issues into industrial designing programs curriculum in Australian universities. Consequently, he scrutinized what courses online university books comprised sustainability topics. Survey results were tabularized and analyzed by descriptive statistics. This study indicated that sustainable development issues are important and related to designing courses, and ensures environmental sensitivity to expand during industrial curriculum designing.

Tombul, (2006) analyzed the importance given to education on environment in formal and non-formal education institutions of Turkey at Ministry level and development plans. It was pointed out that education for the environment was not cared enough to create environmental awareness and consciousness.

Tuncer&Erdoğan, (2006) aimed, in their study, to present the assessment of a course prepared for the purpose of developing habits about sustainable life of university students. The study comprised the course named "Education and Awareness for Sustainability" that is given in Middle East Technical University Faculty of Education, Department of Primary Education for four years. 85 students taking the course participated in the assessment study. Assessment period consisted of three phases as the needs analysis, formative assessment and determinative assessment. In data collection process, two different questionnaires were given to the participants, firstly needs assessment questionnaire and finally determinative assessment questionnaire. In addition, interviews were held with the students for the assessment of the process, and the classroom environment was observed by different observers. And data analyses were carried out using qualitative and quantitative research techniques. As a result of the assessment study, it was demonstrated that forming the course content with events related to real life, majorly contributes to raise awareness and improve responsibilities of students regarding environmental and sustainability issues.

Hudson, (2006) designed a science teaching for four persons in order that the issues on sustainable life could be understood in his study. Two classes participated in the research consisting of 14 candidate's science teacher and secondary school students.

As research subjects, providing sustainability for habitats of frogs and the effect of chemical substances mixed up with water were investigated. Teacher candidates in the research used a four-step instructional sequence in order to simplify the learning of students regarding conceptions about sustainable life. This sequence consisted of; determining matters on sustainable life, discovering related concepts, recording and clarifying understood concepts and the studies in brainstorming technique arranged for creating projects related to the future based on solutions. It was concluded at the end of the study that science education is effective for sustainable life that is planned in four steps.

Birdsall, (2006) investigated whether including New Zeland students between the ages of 11-12 in environmental education under the scope of regional lake environment will contribute to develop their perception about sustainability conception. The data was collected in four points during the program in this research. Semi-structured interviews were conducted with students both at the beginning and at the end of the program. The students were asked to state the sustainability in their own words by giving examples during such interviews. They were asked in the program to think out how a lake could be sustainable in order to be used in future and then, to verify their designs in terms of sustainability sense. The parameters of this task are pertaining to anticipation of students on how to use them in future and to express directly their own thoughts. At the end of the study, it was observed that it is hard to develop sustainability conception in children at such age ranges, teachers have to and teach sustainability concept by only a few key words. At the end of the study, it was recommended that hands-on activities should be included in environmental programs as active experiences in environmental education actuate the brains, hearts and hands of students.

Ryu&Brody, (2006) demonstrated in their study to university graduates how interdisciplinary education simplifies learning, behaviours of participants and change their perceptions by using ecological footprint analysis regarding sustainable development. A research design with uneducated pre-test and post-test control group was used in this study. It was pointed out in Texas A&M university in 2004 how sustainable development education could change ecological footprint of students. As a result of the study, it was observed that students' sustainable behaviours which were measured with their ecological footprints showed increase, and ensured a quantitative

perspective by using ecological footprint calculation on sustainable development matter changed behaviours and perceptions of those receiving education on that subject.

Bülbül, (2007) aimed to demonstrate the effects of cooperative learning method in Environment and Human courses of secondary schools on attitudes and access levels of students towards environment. It was concluded that cooperative learning method influences positively students' academic success, cognitive gains and permanence levels in Environment and Human courses, but it did not influence positively students' attitudes towards environment.

Buchan et al., (2007) sought to contribute to determination of educational content for sustainable development in the research named "ten year-education for sustainable development (2005-2014)". At the end of the research, it was assured to associate certain themes with each other among comprehensive issues. It was designed as an issue in which key conceptions preparing postgraduate students to either international or regional career studies on sustainability were detailed.

Kühtz, (2007) did a research on the issues and anxieties about sustainable development in Italy by focusing on the role of education on this matter. Concept maps were developed by 49 people living in Italy and their differences were analyzed and the objectives of the seminar designed for mental and natural ecology were discussed. The aim was to ensure consciousness about values and sustainable development ethics. Concept maps and open-ended questions were benefited from. Based on the data obtained, 49 participants focused on the fact that education has the main role in being active and that it is necessary to consider the culture and the ways to fulfill sustainable development.

Lourdel, (2007) focused on how to resolve complexity in pedagogical aspect into the study he conducted based on the fact that sustainable development could not be integrated easily with the curriculum of engineers as additional course, due to its complexity. He tried to evaluate the thoughts of students on sustainable development. He analyzed how students made out the sustainability by using concept maps. The assessment of the mentioned concept maps is based upon semantic category approach. This study demonstrated that perceptions of students on sustainable development before being trained on it, focus on environmental and economic viewpoints. An increase was observed in the number of words that they fit in each category after the training on

sustainable development (implications on principles and complexity of sustainable development, institutional stakeholders, social and cultural viewpoints). Their visions were enriched and developed.

Keleş, (2007) concluded in his study which was carried out to use and evaluate ecological footprint as an environmental education tool for sustainable life that ecological footprint, that is used as an educational tool in environmental education, is efficient in developing awareness, attitudes and behaviours of teacher candidates on sustainable life. Furthermore, he detected that teacher candidates developed critical thinking skills on reducing ecological footprint and accordingly, their awareness, attitudes and behaviours regarding things they should do for reducing their footprint improved in a positive way. He determined that food sector made the biggest effect to footprint (M=3,91) of teacher candidates of science and technology.

Kermath, (2007) demonstrated that there are important connections among protecting biodiversity and campus and urban architect, perceiving natural heritage, environmental literature and the role of campus architecture in large communities. This study also helped to show at the same time how it explains values of campus architecture and how education, research and social cooperation is realized. This study is a literature review. The project of Stetson University helped to improve the campus towards green movement which started to form newly with approaches causing reactions and being beyond reformation with holistic campaigns. Biodiversity is at the back of energy usage, source consumption and waste management in sustainability of premises in the world. Such kind of deficiency is implied with this research. It was emphasized on the necessity of encouraging studies to resolve such deficiency, drawing attention to biodiversity crisis and the role that universities play on it.

Ollervides&Farrell, (2007) sought in their study to mention about their success stories regarding sustainable development education in coastal areas in field studies at schools. Such success depends on unique academic model; this model includes sustainable development opportunities, the problems to be handled and adding local community to this program. The research and technical contributions of the center were made for sustainable development. This academic model includes a five-year research plan, research projects, field studies and courses as well as social institutions and social services. During this program, the students worked as costumer/institutional

stakeholders, in professional sessions as collaborators, advisors and problem solving individuals taking part in field studies. It was seen in this research that the described academic model and program curriculum increased the management of natural resources and capacity of researches, and achieved success on sustainable development.

Domask, (2007) sought to give an example that experimental learning approaches will give a concrete example that international sustainability studies fulfill certain targets effectively. The researcher demonstrated how non-traditional educational approaches are integrated into traditional lecture methods through multi dimensional international experimental programs in American universities. He stated at the end of the study that experimental learning approaches are pretty effective on sustainability matter, and he unified theoretical knowledge with application and helped an interdisciplinary effective teaching program to be improved.

Venetoulis&Talberth, (2007) clarified the definition of ecological footprint and suggested many methodological and theoretical specifics in this research. This new approach includes the entire bio-capacity on earth, allocates space for other species, reallocates carbon budget and announces bio-capacity of carbon sequestration. This new approach was used to calculate footprints of 138 countries and compared with the results in standard model. It was concluded that global footprint of humanity and ecological excess have sufficiently grown and this new approach is an important step for making ecological footprint analysis and it is an important assessment tool for sustainability.

Janis, (2007) aimed to unify with ecological footprint and calculate the amount of energy use, transportation fees of and wastes produced by Ohio State University. Ecological footprint calculation method converted the use of electricity, oil and natural gas in energy use, and the use of such quantities in the field biologically into values from hectare. When transportation footprint calculation was made, the cars and buses used in a year at Ohio State University were taken as basis; amount of fuel used in vehicles and their maintenance were calculated being associated with the area they covered. Waste footprint was calculated by converting garbage and recycling tonnages to footprint value by composition elements. The energy, transportation and waste footprint of the university were calculated to be 8.66 global hectares annually per capita. This was interpreted as every student, faculty member and permanent staff needs an

area of 8.66 hectares annually to ensure sustainability of energy, transportation and waste use at the university. Most footprints are deemed to be loaded to the effects of vehicles with 5.41 hectares and electricity with 1.80 hectares. For the aim of reducing ecological footprint, it was concluded that environmental superiority effort should be made in areas where ecological footprint of Ohio State University is high.

Keleş and Aydoğdu, (2010) investigated in their study the effect of ecological footprint applications that are used as environmental education tool on teacher candidates of science and technology on changing their attitudes, awareness and behaviours. It was seen that awareness, attitude and behaviour points of science and technology teacher candidates increase on the tests upon ecological footprint applications, and as an environmental education tool for sustainable life that ecological footprint is used as an educational tool in environmental education is efficient in developing awareness, attitudes and behaviours of teacher candidates on sustainable life and environment.

Grigoryeva, (2010) concluded that using ecological footprint as an indicator in education of ecology is an effective tool in planning behaviours of individuals and evaluating the effects of individuals on environment. Weinberg & Quesenberry, (2010) stated that undergraduate students attending information technologies course where first steps of global and local sustainability theme and key concepts are taken comprehend the importance of sustainable life, understand and witness how individual, social and national ecological footprints are structured and discover how to use information and communication technologies to reduce consumption after ecological footprint trainings given.

Öztürk, (2010) investigated the effect of ecological footprint concept in changing knowledge and attitudes of students in science and technology courses towards environment. Experimental research model which is based on pre-test and post-test applications where experimental and control groups were involved was used in this study. The research was conducted in 2009-2010 academic year with seventh grade science and technology course students in four different primary schools of Ankara. During applications of the research, activities with student participation were organized. Success scale for the environment, one to be pre-test and one to be post-test in data collection process, attitude scale for attitudes towards environment and questionnaire

for consumption habits consisting of open-ended questions were applied in order to determine preferences for consumption habits. The success and attitude results for data obtained were analyzed in statistics program. It was approved as a result of data obtained statistically that there is no significant difference between experimental and control groups on success, but there is significant difference on attitude. Data obtained from open-ended questionnaire was presented with content analysis by making percentage frequency calculations.

Keleş, (2011) made a research on the effect of ecological footprint education where 5E learning cycle model with regard to reducing footprint of totally 124 primary school students attending 4th, 5th, 6th, 7th and 8th grades. The course flow was realized according to 5E model in the study conducted to calculate ecological footprints and increase the knowledge of the students participating in the research regarding ecological footprint concept. The data obtained showed that ecological footprints of primary school students taking part in the research diminished at the end of the research. Furthermore, it can be said under the light of research findings that 5E learning model which was used in the research is efficient for all students regardless of gender.

Coşkun, (2013) did not observe any significant difference in sub-dimensions of wastes and water consumption in terms of place of residence for the longest period, while no significant difference was identified regarding educational background of parents and grade variables in ecological footprint awareness levels of classroom teachers in the study he conducted with the object of specifying ecological footprint awareness levels of classroom teacher candidates. Ecological footprint of female classroom teacher candidates in energy, wastes and water consumption sub-dimensions was found to be significantly higher than male candidates.

Coşkun&Sarıkaya, (2014) investigated ecological footprint awareness levels of classroom teacher candidates in this research. The research was conducted according to relational screening model. Variables of the research are gender, class grade, income level and educational background of parents, place of residence for the longest period. The data was collected by "Ecological Footprint Awareness Scale" that was developed by researchers and wasanalyzed by SPSS 19.0 package program. The research was completed in two steps, which are preliminary and actual practice. The preliminary application was carried out with 283 students studying in Science Teaching Department

3rd grade and Gazi University, Gazi Education Faculty Classroom Teaching Department the 1st and 4th grade in 2012-2013. The actual application was carried out with totally 372, the 2nd and 3rd grade students studying in Gazi University, Gazi Education Faculty Classroom Teaching Department in 2012-2013. At the end of the research, "ecological footprint awareness scale" was developed. On the basis of this scale, there was no significant difference in terms of educational background variables of the parents of classroom teacher candidates and class grade in their ecological footprint awareness. According to the place of residence, lived the longest period, there was no significant difference in sub-dimension of wastes and water consumption, while significant difference was found in sub-dimensions of food, transportation-sheltering and energy. Considering ecological footprint awareness levels according to gender, there was not significant difference in sub-dimensions of food, transportation-sheltering, while there was a significant difference in sub-dimensions of energy, wastes and water consumption in favor of females.

Dinç, (2015) emphasized, in this study, the necessity of Turkey to tend to renewable energy sources in order to reduce carbon footprint. The environmental, social and economic aspects of positive effects to be caused by clean energy production and consumption gain great value in terms of sustainability. In this regard, realization of energy production with high efficiency and clean technologies from energy sources and encouraging the use of environmental-friendly renewable energy sources instead of fossil fuels are among the most important aims of our present day.

Awida&Aslanova, (2016) aim it determining the environmental attitudes and behaviors of the university students with different cultures. This is a research prepared by asking students' opinions related to their attitudes and behaviors towards the environment and the sustainable development. In other words, this research was prepared in accordance with survey model.The population of the research is comprised of 300 university students with different cultures studying at Near East University in 2015-2016 academic year. In this research, the sustainable development survey and the environmental attitude and behavior survey were used as the data collecting tools. The scales, applied to the students, were comprised of 60 questions. In the survey, with 58 questions, the first 10 questions were to get personal information, 24 questions were to determine their knowledge about the sustainable development, 17 questions were to determine their environmental attitudes and 7 questions were to determine their

environmental behaviors. The data obtained from the surveys was analyzed by using SPSS 20.0 program. While determining whether the participant students' knowledge about the sustainable development and the environmental attitude and behavior differed according to their genders, unrelated "t"-test was used; and while determining whether it differs according to the educational background of their parents, ANOVA, Scheffe, Manova, Wilks' Lambda Test was used. At the end of the research, it was seen that the attitudes and behaviors of the university students with different cultures towards the environment and the sustainable development were still not sufficient.

CHAPTER III
METHOD OF THE RESEARCH

In this section, there is information about research model, exemplary, application steps of the research, data collection method and data analysis.

3.1. Method of the Research

This study was carried out to determine levels of Libyan university students on ecological footprint and sustainable life. For this purpose, the study was carried out with "screening model". Survey researches are research types that a researcher tries to give detailed information about the current situation. Fraenkel and Wallen (2006) touched upon the following three survey researches:

- In order to be able to describe opinions or features of a great community (universe), a section (exemplary) made of people that can represent this community is selected.

- The data needed in a research is based on the answers given for the questions asked to individuals.

- Data of research is obtained from a part of the community (exemplary) to represent it, but not from the entirety of people in a society (universe) where features will be described (Büyüköztürk et al., 2010).

Survey researches are research types having high validity on account that the data is obtained from different sources and detailed information is acquired about the subject of the research. In addition, the data is collected from broad masses in survey researches. Based on such features, survey researches is conducted on greater groups in comparison with experimental researches (Tanrıöğen et al., 2012).

Survey models are the research models that intend to determine the presence and/or degree of covariance between or among two or more variables. The variables that will be sought for a relation are symbolized, but this symbolization should be done in such a way to allow for a relational analysis. The current situations and conditions are exactly put forth in survey models (Karasar, 2009). In this research, "*Personal Knowledge Test*" and "*Ecological Footprint Survey*" was used as dependent variable.

3.2. The Universe and Sample

A universe for a study is a big group that viable or non-viable creatures create in which data is needed for answering the research questions. In other words, the universe can be described as a community where results are valid and interpreted (Büyüköztürk et al., 2010).

The universe of the study consists of university students studying in Libya in 2016-2017 academic year. The research exemplary consists of 246 female, 254 male, totally 500 students studying in the same academic year. The number of students forming the exemplary of the research according to their sex is given in Table 2.

Table 2
Distribution Table of Students Forming the Examplary According to Their Sex

Sex	Number of Students
Female	246
Male	254
Total	**500**

3.3. Data Collection Technique

Both national and international literature was examined in order to support theoretical aspect of the study in obtaining information to be used in the research, and field research based on survey was applied in order to support its practical aspect.

First of all, the survey questions were determined in order to measure the presence and intensity of the problems forming the objective of the thesis study in investigation field. For this purpose, the thesis studies that were carried out before, pedagogical sources in academic level and sources based on measurement and assessment were made. At the end of this process, the scales that were primarily formed as draft were made available for application. The data that obtained as a result of the scales applied to the students were computerized and evaluated.

3.4. Data Collection Process

The data was collected from the students studying in 2015-2016 academic year in Libyan universities, when they were suitable. The researcher was present with the university students while filling data collection tools and made any clarification that would be necessary.

3.5. Analysis of Data

The data was analyzed by using SPSS-20 (Statistical Package for the Social Sciences) package program. In analyzing the data and investigating the statistics T-test, Anova, Tukey test, Frequency test, Descriptive test techniques were used.

3.6. Validity and Reliability

The researcher focused on the reliability and the validity of the research method in this study. The reliability of a scale is about the random errors in the scales that were prepared by the researcher. The data obtained with the help of a not reliable scale has no contribution to the research. Because when the same test is applied to the same people in different times and the results are seen to be different, it won't be possible to interpret on the results obtained (Altunışık et al., 2007).

Table 3
Validity and Reliability of Ecological Footprint Scale

Reliability Statistics	
Cronbach's Alpha	N of Items
,763	35

Reliability coefficient of the questionnaire was calculated as .763 as it can be seen in Table 3. Coefficients that are around and above .70 in social sciences are acceptable and specify reliability level (Büyüköztürk, 2008).

CHAPTER IV

FINDINGS AND COMMENTS

The findings obtained as a result of the research are given in tables and interpreted in this section.

4.1. Demographic Characteristics

In this chapter, the findings and comments with regard to demographic features are included.

Table 4

Distribution of the Exemplary According to Sex

Gender	Frequency	Percent
Female	246	49,2
Male	254	50,8
Total	**500**	**100,0**

As seen in Table 4, the exemplary of the research consists of 500 people. %49 of the participants are female students, while %50,8 of them are male students. We can see that in the distribution of the exemplary according to sex, the number of males is greater than females.

Table 5

Distribution of Exemplary According to Age

Age	Frequency	Percent
17-18	263	52,6
19-20	153	30,6
21-22	84	16,8
Total	**500**	**100,0**

Considering Table 5, it can be seen that the exemplary consists of students between the ages of 17-18 in 52,6%, 19-20 in 30,6% and 21-22 in %16,8. We can see that the distribution of exemplary according to age is the highest between the ages 17-18.

Table 6

Distribution of Exemplary According to Population

Population	Frequency	Percent
Less than 500	36	7,2
Between 500 – 2000	72	14,4
Between 2000 - 5000	84	16,8
Between 5000 - 10000	71	14,2
Between 10000 – 20000	73	14,6
Between 20000- 50000	79	15,8
More than 50000	85	17,0
Total	**500**	**100,0**

As it can be seen in Table 6, 7,2% of the population distribution of exemplary is less than 500, 14,4% between 500-2.000, 16,8% between 2.000-5.000, 14% between 5.000-10.000, 14,6% between 10.000-20.000, 15,8% between 20.000-50.000 and 15,8% more than 50.000. Considering the distribution of the exemplary according to population, we can see from Table 6 that the population is more than 50.000.

Table 7

Distribution of Exemplary According to Educational Background of Fathers

Father Education	Frequency	Percent
Uneducated	66	13,2
Primary	76	15,2
High School	157	31,4
College or University	101	20,2
Master or Doctoral	100	20,0
Total	**500**	**100,0**

As it can be seen in Table 7, fathers of students forming the exemplary have educational background as; 13,2% uneducated, 15,2% primary school, 31,4% high school, 20,2% college or university and 20% master and phd. Considering the distribution of exemplary according to educational background of fathers, we can see that fathers are generally high school graduates. The distribution of the exemplary is formed at the lowest with uneducated, while the majority is high school.

Table 8
Distribution of Exemplary According to Educational Background of Mothers

Mather Education	Frequency	Percent
Uneducated	95	19,0
Primary	111	22,2
High School	126	25,2
College or University	114	22,8
Master or Doctoral	54	10,8
Total	**500**	**100,0**

As it can be seen in Table 8, mothers of students forming the exemplary have educational background as; 19% uneducated, 22,2% primary school, 25,2% high school, 22,8% college or university and 10,8% master and phd. Considering the distribution of exemplary according to educational background of mothers, we can see that mothers are generally high school graduates. The distribution of the exemplary is formed at the lowest with master and doctoral degrees, while the majority is high school.

Table 9
Distribution of Exemplary According to Moderate Income Level

Salary	Frequency	Percent
Between 1000- 2000	237	47,4
Between 2000-4000	133	26,6
Between 4000- 6000	77	15,4
More than 6,000	53	10,6
Total	**500**	**100,0**

We can see in Table 9 that the families of students forming the exemplary have a monthly average income as; 47,4% is less than 1,000-2.000 TL, 26.6% between 2,000-4,000 TL, 15,4% between 4,000-6000 TL, 10,6% more than 6,000 TL. Considering the distribution of exemplary according to moderate income level, we can see that the average monthly income of the participants is between 1000-2000 TL.

4.2. Interpretations and Findings on Sub Problems

4.2.1. Findings regarding The First Sub Problem

In this chapter, the findings and comments with regard to sub-problems of the research are included.

▪ Do the consciousness levels of Libyan university students on ecological footprint and sustainable life differ according to their genders?

Table 10
T-Test According to Awareness, Attitudes and Behaviours of Students

Attitude	N	$\overline{\text{X}}$	SS	t	df	p	Description
Female	246	17,55	2,00				p>.05
				3,202	498	,812	
Male	254	17,60	2,26				Insignificant difference
Behaviour	N	$\overline{\text{X}}$	SS	t	df	p	**Explanation**
Female	246	12,15	2,41				p>.05
				,047	498	,108	
Male	254	12,29	2,37				Insignificant difference
Awareness	N	$\overline{\text{X}}$	SS	t	df	p	**Explanation**
Female	246	38,48	4,77				p<.05
				,546	498	,024	
Male	254	39,43	4,59				Significant variation

As it can be seen in Table 10, there was a significant variation in only awareness dimension as a result of T-test analysis of awareness, attitudes and behaviours according to gender towards sustainable life regarding ecological footprint application of students (p=,024 , p<,05). When this variation is examined in detail, it can be seen that females ($\overline{\text{X}}$ =38,48) have lower awareness level than males ($\overline{\text{X}}$ =39,43). Taking into consideration this result, male students in Libya have more sustainable awareness intended for ecological footprint implementation.

4.2.2. Findings regarding The Secondary Sub-Problem

- Do the consciousness levels of Libyan university students on ecological footprint and sustainable life differ according to the population level of the area where they live?

Table 11

Anova Test of Awareness, Attitude and Behaviour of Students According to the Population of Their Settlement

Attitude	Sum of Squares	df	Squares Average	F	p	Explanation
Interfactional	15,436	6	2,572	,559	,763	p>.05
Intragroups	2268,363	493	4,601			Insignificant difference
Total	2283,800	499				
Behaviour	**Sum of Squares**	**df**	**Squares Average**	**F**	**p**	**Explanation**
Interfactional	49,902	6	8,317	1,451	,193	p>.05
Intragroups	2823,959	493	5,728			Insignificant difference
Total	2873,862	499				
Awareness	**Sum of Squares**	**df**	**Squares Average**	**F**	**p**	**Explanation**
Interfactional	293,681	6	48,946	2,244	,038	p<.05
Intragroups	10748,740	493	21,802			Significant variation
Total	11042,422	499				5-6

5: below 20 thousand, 6: between 20-50 thousand, 7: 50 and above

As it can be seen in Table 11, there was a significant variation in only awareness dimension as a result of Anova test of awareness, attitudes and behaviours according to population level where they live, towards sustainable life regarding ecological footprint application of students (p=,038 , p<,05). It can be seen that awareness level in places having a population between 20 thousand and 50 thousand ($\overline{X}$=40,18) is higher than awareness level of the places under 20 thousand ($\overline{X}$=38,08) after Tukey test that was

conducted to find out the variation in awareness dimension. Also, it can be seen that awareness level of the places having a population above 50 thousand ($\overline{X}$=38,97) is higher than those under 20 thousand. Taking into consideration this result, as population rate decreases, awareness level decreases too.

4.2.3. Findings regarding The Third Sub-Problem

  ▪ Do the consciousness levels of Libyan university students on ecological footprint and sustainable life differ according to monthly income level of their family?

Table 12
Anova Test of Awareness, Attitude and Behaviour of Students According to Their Family Income Level

Attitude	Sum of Squares	df	Squares Average	F	p	Explanation
Interfactional	14,863	2	4,954	,857	,466	p>.05
Intragroups	554,927	497	5,780			Insignificant difference
Total	**569,790**	**499**				
Behaviour	**Sum of Squares**	**df**	**Squares Average**	**F**	**p**	**Explanation**
Interfactional	158,951	2	52,984	4,906	,003	p>.05
Intragroups	1036,839	497	10,800			Insignificant difference
Total	**1195,790**	**499**				
Awareness	**Sum of Squares**	**df**	**Squares Average**	**F**	**p**	**Explanation**
Interfactional	54,978	2	18,326	,710	,548	p>.05
Intragroups	2477,022	497	25,802			Insignificant difference
Total	**2532,000**	**499**				

  As it can be seen in Table 12, there was a significant variation as a result of Anova analysis of awareness, attitudes and behaviours according to income levels of

families towards sustainable life regarding ecological footprint application of students (p>,05).

4.2.4. Findings regarding The Fourth Sub-Problem

▪ Do the consciousness levels of Libyan university students on ecological footprint and sustainable life differ according to the educational background of their parents?

Table 13

Anova Test of Awareness, Attitude and Behaviour of Students According to Educational Background of Their Fathers

Attitude	Sum of Squares	df	Squares Average	F	p	Explanation
Interfactional	39,761	5	7,952	1,751	,122	p>.05
Intragroups	2244,039	494	4,543			Insignificant difference
Total	2283,800	499				
Behaviour	**Sum of Squares**	**df**	**Squares Average**	**F**	**p**	**Explanation**
Interfactional	7,773	5	1,555	,268	,931	p>.05
Intragroups	2866,089	494	5,802			Insignificant difference
Total	2873,862	499				
Awareness	**Sum of Squares**	**df**	**Squares Average**	**F**	**p**	**Explanation**
Interfactional	106,511	5	21,302	,962	,440	p>.05
Intragroups	10935,911	494	22,137			Insignificant difference
Total	11042,422	499				

As it can be seen in Table 13, there was a significant variation as a result of Anova analysis of awareness, attitudes and behaviours according to educational background of father towards sustainable life regarding ecological footprint application of students (p<,05).

Table 14

Anova Test of Awareness, Attitude and Behaviour of Students According to Educational Background of Their Mothers

Attitude	Sum of Squares	df	Squares Average	F	p	Explanation
Interfactional	13,649	4	3,412	,744	,562	p>.05
Intragroups	2270,151	495	4,586			Insignificant difference
Total	**2283,800**	**499**				
Behaviour	**Sum of Squares**	**df**	**Squares Average**	**F**	**p**	**Explanation**
Interfactional	18,083	4	4,521	,784	,536	p>.05
Intragroups	2855,779	495	5,769			Insignificant difference
Total	**2873,862**	**499**				
Awareness	**Sum of Squares**	**df**	**Squares Average**	**F**	**p**	**Explanation**
Interfactional	155,847	4	38,962	1,772	,133	p>.05
Intragroups	10886,575	495	21,993			Insignificant difference
Total	**11042,422**	**499**				

As it can be seen in Table 14, there was a significant variation as a result of Anova analysis of awareness, attitudes and behaviours according to educational background of mother towards sustainable life regarding ecological footprint application of students (p<,05).

4.2.5. Findings regarding The Fifth Sub-Problem

▪ Do the consciousness levels of Libyan university students on ecological footprint and sustainable life differ according to their monthly income levels?

Table 15

Anova Test of Awareness, Attitude and Behaviour of Students According to Their Family Income Level

Attitude	Sum of Squares	df	Squares Average	F	p	Explanation
Interfactional	13,195	3	4,398	,961	,411	p>.05
Intragroups	2270,605	96	4,578			Insignificant difference
Total	2283,800	99				
Behaviour	**Sum of Squares**	**df**	**Squares Average**	**F**	**p**	**Explanation**
Interfactional	13,195	3	1,768	,133	,941	p<.05
Intragroups	2270,605	96	5,789			Significant variation
Total	2283,800	99				1-3
Awareness	**Sum of Squares**	**df**	**Squares Average**	**F**	**p**	**Explanation**
Interfactional	159,542	3	53,181	2.424	,065	p>.05
Intragroups	10882,880	96	21,941			Insignificant difference
Total	11042,422	99				

As it can be seen in Table 15, there was a significant variation as a result of Anova analysis of awareness, attitudes and behaviours according to income level of families towards sustainable life regarding ecological footprint application of students (p<,05).

4.2.6. Findings regarding The Sixth Sub-Problem

- What are the consciousness levels of Libyan university students on ecological footprint and sustainable life?

Table 16
Average of General Awareness, Attitudes and Behaviours of Students

	N	$\overline{X}$	Ss	Max	Max
Student_Attitude	500	17,58	2,13	11,00	23,00
Student_Behaviour	500	12,32	2,39	6,00	20,00
Student_Awareness	500	38,96	4,70	25,00	64,00
Total	**500**				

As it can be seen in Table 16, when averages of awareness, attitudes and behaviors towards sustainable life on ecological footprint application of students are investigated, based on the fact that students' attitudes ($\overline{X}$=17,58), behaviours ($\overline{X}$=12,32) and awareness ($\overline{X}$=38,96) points are more than half of maximum average point, it can be defined that their attitude, behaviour and awareness are intermediate.

CHAPTER V
THE RESULT AND RECOMMENDATIONS

The findings obtained from the research focused and debated in this section.

5.1. Result

In this research, it was investigated whether ecological footprint used as environmental education tool in evaluating awareness, attitude and behaviour of university students in Libya towards sustainable life is effective or not, and the following results were obtained upon the studies conducted.

There was a significant variation in only awareness dimension as a result of T-test analysis of awareness, attitudes and behaviours according to gender towards sustainable life regarding ecological footprint application of the participants in Libya (p=,024 , p<,05). When this variation is examined in detail, it can be seen that females ($\overline{X}$ =38,48) have lower awareness level than males (=39,43) (table 10). Taking into consideration this result, male students in Libya have more sustainable awareness intended for ecological footprint implementation. According to the results of the study conducted by Akıllı et al., (2008) regarding the relationship between gender and ecological footprint, the footprint of women was found to be 4.46 gha, while men's was found to be 5.1 gha. Based on thise data, it was detected that the footprint of men is a little greater than women's footprint even if no significant difference was observed in terms of gender. People have a life style over carrying capacity of the nature in our country. While sustaining their life, they have consuming preferences having negative effects on nature. What is meant to be reached by ecological footprint calculation is to balance biological capacity of nature with our consumption habits and create ecological consciousness and ensure sustainability by quantifying ecological deficit by in numeric data. This result matches up with the result of the research. Keleş (2011) emphasized in his study "Effect of Learning Cycle Model on Reducing Students' Ecological Footprint" that applied teaching method is successful in reducing ecological footprint of individuals and concluded that, similar to this work, ecological footprint of individuals showed a significant difference according to gender variable. This result shows similarity with the result of the research.

There was a significant variation in only awareness dimension as a result of Anova test (table 11) of awareness, attitudes and behaviours, according to the population level where they live, towards sustainable life regarding ecological footprint application of Libyan students (p=,038 , p<,05). It can be seen that the awareness level in places having a population between 20 thousand and 50 thousand ($\overline{X}$=40,18) is higher than awareness level of the places under 20 thousand ($\overline{X}$=38,08) after Tukey test that was conducted to find out such a variation in awareness dimension. Also, it can be seen that awareness level of the places having a population above 50 thousand ($\overline{X}$=38,97) is higher than those 20 thousand. Taking into consideration this result, as population rate decreases, awareness level decreases too. Aslan (2005) supported in the study she conducted the research result that there is no difference between grade, environmental attitudes and behaviours.

There was a significant variation as a result of Anova analysis of awareness, attitudes and behaviours according to income levels of families towards sustainable life regarding ecological footprint application of the participants (p>,05). The results of this research show similarity with the result of the research conducted by Şenyurt, Temel and Özkahraman (2011) where sensitivity of university students towards environmental issues were investigated that there is no significant difference between the sensitivity of university students towards environmental issues and their income level. This result matches up with the result of the research.

There was a significant variation as a result of Anova analysis (table 13, 14) of awareness, attitudes and behaviours according to educational background of parents towards sustainable life regarding ecological footprint application of Libyan students (p<,05). Coşkun (2013) did not determine any significant difference regarding educational background of parents and grade variables in ecological footprint awareness levels of classroom teachers in the study he conducted with the object of specifying ecological footprint awareness levels of classroom teacher candidates. This result matches up with the result of the research.

There was a significant variation as a result of Anova analysis of awareness, attitudes and behaviours according to income level of families towards sustainable life regarding ecological footprint application of students (p<,05) (Table 15). In some

environmental researches that were conducted by academicians before, similar values to this result were obtained (Akıllı, Kemahlı, Okudan and Polat, 2008., Yıldız, 2014., Erdoğan, 2003).

When averages of awareness, attitudes and behaviors towards sustainable life on ecological footprint application of Libyan university students are investigated, based on the fact that students' attitudes ($\overline{X}$=17,58), behaviours ($\overline{X}$=12,32) and awareness ($\overline{X}$=38,96) points are more than half of maximum average point, it can be defined that their attitude, behaviour and awareness are intermediate.Keleş (2007) found out similar results with this one in a research he conducted. The researcher investigated ecological footprint applications as environmental education tool in changing awareness, attitudes and behaviours of candidates towards sustainable life. That awareness, attitude and behaviour points lapse from bad and average level to good level after ecological footprint as environmental education tools towards sustainable life of teacher candidates demonstrates that the application is effective in developing awareness, attitudes and behaviours of teacher candidates of science and technology regarding sustainable life.

As a result, it was found in this research that consciousness levels of Libyan university students on ecological footprint and sustainable life is at intermediate level.

5.2. Recommendations

The following suggestions can be made based on the results obtained from the research:

▪ Lectures can be given for increasing consciousness level of students' families in schools in relation to ecological footprint with the object of extending environmental awarenes to every segment of society regarding sustainable life.

▪ In the sources used during education period, the conceptions of sustainability and ecological footprint should be included.

▪ Similar researches should be implemented in a longer time on wider exemplary to the students studying at primary, secondary and high schools.

- The current situation should be identified and applications should be conducted to reduce ecological footprint by making ecological footprint calculations in schools, universities and public institutions.

- When environmental education activities are planned, applications for ecological footprint conception should be included, within this framework; student-centered group work should be organized.

- Not only schools, universities but the society also should be informed. Ecological footprint calculations should be expanded for raising such awareness and activities about sustainability and ecological footprint conceptions should be organized.

- As ecological footprint calculations that are carried out show concretely the effects of individuals on environment, applications for ecological footprint calculation should be included in teaching activities.

- Parents and teachers bringing up young generations should be informed on that issue and they should be taught to be a model for the children with their behaviours.

- Different environmental problems between the countries having large and small ecological footprint should be taught in order that students could learn by individually and allowing them to make comparisons.

- The students should be encouraged to prepare projects for reducing their ecological footprint, thus they are incented to find solutions for environmental problems.

- Not only students but also all general public should be informed on this matter through either visual or printed media, and what is awaiting creatures should be demonstrated to people through several animations or films concretely.

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Annex-1

PERSONEL INFORMATION

Gender………………… Female (   )   Male (   )

Age ……….

Nationality…………………   Other ( )

POPULATION OF THE AREA YOU LIVE

Less than 500 ( )   Between 500 – 2000 ( )   Between 2000 - 5000 ( )

Between 5000 - 10000 ( ) Between 10000 – 20000 ( )   Between 20000- 50000 ( )

More than 50000 ( )

EDUCATION SITUATION OF YOUR FATHER:

Elementary   1☐
Primary School   2☐
Secondary School   3☐
High School   4☐
University / Faculty   5☐
Master / Doctorate   6☐

EDUCATION SITUATION OF YOUR MOTHER:

Elementary   1☐
Primary School ☐2
Secondary School   3☐
High School   4☐
University / Faculty   5☐
Master / Doctorate   6☐

HOW MUCH IS THE MONTHLY APPROXIMATE INCOME OF YOUR FAMILY?

Between 1,000 TL – 2,000TL   4,000TL   ☐   Between 2,00

Between 4,000 - 6,000TL   ☐   More than 6,000 TL ☐

Annex-2

ECOLOGICAL FOOTPRINT SURVEY

Name and Surname: **Student Number:**

Instruction:

Please read the following descriptions before answering the questions of the questionnaire.

This questionnaire has been prepared to evaluate your attitudes and behaviours towards environment as well as your knowledge about "Ecological Footprint". This is not either a test or an examination. Please answer as you feel and you know to be right. Please review the following information carefully before filling in the questionnaire.

LIKERT TYPE SCALE

1= I strongly disagree

2= I disagree

3= I agree

4= I strongly agree

Please read the following statements and answer according to the statements corresponding numeric values in likert type scale. Put (√) mark on the box where you think the most appropriate answer is. Be sure to answer all questions.

*	Question No	STATEMENTS	I strongly agree	I agree	I disagree	I strongly disagree
T	1	I think recycling process has positive effects on the environment.				
T	2	I believe that my attitude towards environment changes when I watch TV programs about the environment.				
D	3	I read articles about the environment.				
D	4	I am a member of a club/association related to environmental issues.				
T	5	I think that it is important to take action immediately about the environment.				
T	6	I think that I have responsibilities personally in respect of environmental sustainability.				
F	7	I have information about the current strategies used for developing environmental issues.				
T	8	I do not take the environment as one of my parts.				
T	9	Environment is not important for me.				
D	10	I take environmental responsibility as an action for positive change.				
D	11	I take part in the projects related to environmental education in societies where I am.				
D	12	I recycle my wastes.				
T	13	I think environmental education contributes to my personal development.				
F	14	I understand several issues and problems regarding the environment.				
F	15	People are a part of ecosystem.				

Curriculum Vitae

My name is Albashir Ali Abdul Salam Al-Saghir Born on 19.05.1976 in Libya in the city of Surman. In 1982, she began primary school and obtained a preparatory certificate in 1989-1990. In 1991 secondary education began and was completed in 1996-1997. I received a high diploma in the autumn of 2003 from the high position of the Sabratha fishing department (marine fisheries). I got a job at the end of 2007 as a recruiter at the same institute. I worked as a trainer in the Department of Marine Fisheries during the period 2007-2009. After that, he worked as a lecturer in the "practical side" at the Higher Institute in 2010-2011. In 2014 I left the institute to complete my studies and get a master's degree. I had the opportunity to travel to Turkey. I studied English and then I moved to North Cyprus to finish my Masters degree. She began her MA in Near East University (2016-2015) in the Department of Environmental Education and management