



Closure of Göbekli Tepe: Erosion?

İbrahim Yenigün^{1,*} Muharrem Oral² Mahmut Karacizmeli³ Sinan Uyanık⁴ ¹Harran University, Faculty of Fine Arts, Department of Architecture, Sanliurfa, Turkey²Harran University, Faculty of Arts and Sciences, Department of Archeology, Sanliurfa, Turkey³Harran University, Faculty of Fine Arts, Department of Architecture, Sanliurfa, Turkey⁴Bursa Technical University, Faculty of Engineering and Natural Sciences., Environmental Engineering Department, Bursa, Turkey*Corresponding Author: ibrahimyenigun@harran.edu.tr

Abstract

With the discovery of Göbekli Tepe, Urfa has proven to be one of the oldest settlement in history and has been named “Zero Point of History” due to this feature. What happened in the history left countless artifacts and historical mysterious in Urfa and turned it into an open-air museum. One of the most important current mystery is why the life of Göbekli Tepe disappeared. It is an important fact that civilizations disappear not only for reasons such as war, but also due to environmental problems and sometimes, on the contrary, they have survived for many years. Based on these facts; this study aimed to draw attention to the issue of “erosion”, which continues to be a major environmental threat and problem for today’s world, and this issue has been studied specifically for Göbekli Tepe. In the light of all this information, an answer was sought for the question of whether Göbekli Tepe was undergrounded by human or natural means.

Keywords: Göbekli Tepe, Environmental Problem, Erosion, History

Introduction

After living as nomads for many years, human beings settled down with the prevalence of favorable climatic conditions after the last glacial period. With the favorable climatic conditions, people started to settle in regions that are suitable and rich in terms of access to living resources with the development of civilization. Upper Mesopotamia, which was first named as the “Fertile Crescent” by the American archaeologist James Henry Breasted, was one of the most popular of these settlements. With its location at the intersection of Europe, Asia and Africa, it has been accepted as the witness of important historical events and the place where civilization began. It is thought that the first seeds of both agriculture and humanity were blooming in the region where the transition to settled order started and there were many non-pottery Neolithic centers (Atar,2017). Due to many more justifiable reasons, Mesopotamia has been an important center of attraction throughout history and has

been a region where great civilizations were established and developed. Urfa, one of the ancient cities in the region, hosted most of these important civilizations. With Göbekli Tepe (Figure 1) discovered within the city’s boundaries, it proved to be one of the oldest settlements where monumental architecture emerged and began to be known as the “Zero Point of History”.

In addition to the great discovery Göbekli Tepe, which has a history of 12,000 years, Urfa, where numerous historical artifacts are located, is also described as an open-air museum. While the rich memory of the city’s historical texture easily meets with humanity due to the generosity of its genes, the codes of other parts are waiting to be deciphered. An important part of the information that is aimed to be brought to light is the “environment” issues that are of vital concern to today’s societies and their futures. Because it is an important fact that civilizations have survived for many years not only because of war, but also due to environmental problems or vice versa.

Cite this article as:

Yenigun, I., Oral, M., Karacizmeli, M., Uyanik, S. (2021). Closure of Göbekli Tepe: Erosion? J. Agric. Environ. Food Sci., 5(3), 385-392.

Doi: <https://doi.org/10.31015/jaefs.2021.3.17>**Orcid:** İbrahim Yenigün: 0000-0003-4742-0160 Muharrem Oral: 0000-0001-9749-7794

Mahmut Karacizmeli: 0000-0001-5465-4710 Sinan Uyanik: 0000-0001-5290-6830

Received: 27 March 2021 **Accepted:** 29 July 2021 **Published Online:** 24 August 2021 **Revised:** 25 September 2021**Year:** 2021 **Volume:** 5 **Issue:** 3 (September) **Pages:** 385-392**Available online at :** <http://www.jaefs.com> - <http://dergipark.gov.tr/jaefs>**Copyright** © 2021 International Journal of Agriculture, Environment and Food Sciences (Int. J. Agric. Environ. Food Sci.)

This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International (CC-by 4.0) License



Based on these facts; it is aimed to draw attention to the issue of “erosion”, which continues to be a major environmental threat and problem for today’s world, and this issue has been tried to be addressed in the context of Göbekli Tepe, which

is accepted as a great discovery for the world. In the light of all this information, an answer was sought to the question of whether Göbekli Tepe was undergrounded by human or natural means.



Figure 1. Göbekli Tepe.

Environmental problems from past to present

According to some theories, the existence of environmental problems goes back to the first formation of our planet. As one of the data that makes this idea strong, it is shown that there is no oxygen in the process of the formation of the world, and even the highest rate of carbon dioxide. While carbon dioxide, known to be one of the leading pollutants, posed a great danger even with its presence, it initiated the first formations of the greenhouse effect, perhaps one of the biggest environmental problems of today’s world. In the following formation processes of the earth, some of the carbon dioxide reacted with rocks and the other part became liquid by dissolving in the oceans and the cooling of the planet took place (Yenigün,2017). However, the possible dimensions and dangers of environmental problems with such an old past cannot be fully grasped even today.

Mankind and its environment have been in a continuous and dynamic interaction since the early ages. With the feature of being the only creature capable of thinking on the planet, human beings have moved away from this approach due to scientific developments since the seventeenth century, although they did not dominate nature before. Primarily, due to the dominant thoughts of Bacon “knowing is dominating” and Descartes’ “mechanical world view”, the understanding that human is positioned at the center and that the main measure is human has prevailed. This new approach has greatly changed the way human beings view both themselves and the environment they live in. This point of view, which sees man as the owner of the planet he lives in and evaluates every resource within him as his own, was the spark at the beginning of environmental problems. Environmental problems, which gained momentum

especially with the industrial revolution, have reached today’s dimensions that signal danger when they come together with other human-induced factors (Gül,2013).

Although countries have advanced their welfare and economic levels since the twentieth century, they have become limitless in their lives due to the endless demands of human beings. Combined with other factors such as population growth, natural resources have come to the limit of depletion, they are polluted, the balance is disrupted and the spaces have shrunk. Developments that mortgage our future have made new approaches obligatory. Therefore, orientations aiming at “sustainable” approaches, where the environment is not separated and the next generations can live healthily, have started to gain weight (Baykal et al.,2008)

Countries that have brought the level of social development to the highest levels but cannot show the same synchronization in human-environment relationship have consumed fossil fuel, which corresponds to an average of one million years each year compared to the pre-industrial revolution. This consumption has led to common problems that concern the whole world, such as the high rate of carbon dioxide released into the atmosphere and, accordingly, climate change and greenhouse effect. As can be seen in this and many other issues, the transformation of problems from a micro dimension to a macro dimension has taken the concern of the environment beyond being a temporary issue and has exposed humanity to the greatest danger of history. It has been seen that the only salvation of a person who is proud of his development will be through his education and awareness (Kayan,2018). In addition, the idea has been formed that addressing environmental problems in the filter of history

will make a great contribution to the targeted environmental awareness and education. Because the environmental problems experienced in the past will open new doors of curiosity and create a focus of attention in the perception of today's people. With the awareness provided, people will not be able to isolate themselves from the environmental problems experienced, on the contrary, they will see themselves as responsible. However, concrete steps to be taken with this perspective will prevent past mistakes and ensure that correct practices and approaches are taken as role models. Depending on the subject of this study; the issue of "erosion", which continues its current threat even today, and even increases its threat with effective factors such as global climate change and increasing deforestation, has been discussed.

One of the oldest environmental problems in the history of humanity; erosion

Erosion has been one of the oldest environmental problems in the history of the world and with its consequences. The discovery of fire, which is considered to be destructive in terms of nature, combined with its destructive aspect, has been a turning point for the fact of erosion. Plant tissue destroyed by burning formed the most important ground for erosion formation. In time, the desire of man to take everything under control has accelerated this situation. Although the results of erosion, which manifested itself especially due to forest and plant deficiencies, did not make itself felt until the industrial revolution, the situation has reversed in the last century and has deeply felt its effect (Karabıçak et al.,2004).

Plants and animals that lived in the aquatic environment until an estimated 350 million years ago have adapted themselves to living on land. In the later process of millions of years, the remains of the plant and animal species that died mixed into the land part of the planet, causing a thin layer of soil to form. Human beings, who have started to adopt the sedentary life understanding, have started to benefit from this soil in many aspects, especially the supply of food sources. Depending on the increasing demands, the amount of use and cultivation of the land also increased in parallel. However, this situation caused the soil to be exposed to many forces resulting in erosion. People have sometimes been able to control these forces that cause erosion, but most of the time they have not been able to prevent what happened and the destruction caused by erosion was only a spectator. Based on the historical findings, it has been found that many fertile regions have been destroyed as a result of erosion and, depending on, many civilizations and societies have come to an end (Çanga,2016).

Erosion due to major factors such as water and wind; It extensively and permanently affects most ecosystems around the world, such as forest areas, agricultural lands and pastures. According to the latest analysis, approximately 80% of the areas used for agricultural purposes around the world are exposed to erosion ranging from moderate to severe and over 75 billion tons of fertile soil is lost in each passing year. This loss corresponds to an average of 15 times compared to natural soil formation (Orgiazzi et al.,2016).

With erosion, which impairs soil health, the top layer of the soil, which is the richest in terms of organic matter and

biology, disappears. This loss, which is extremely vital for plant life, renders the soil inefficient (Pimentel et al.,1998). The inefficient soil causes chain consequences leading to desertification and brings with it multiple economic damages (Blanco et al.,2008).

The loss of the soil, which takes hundreds of years to form, in very short periods due to negative factors, critically affects the vital balances in the world. Because the land, which is indispensable not only for the present but also for the future existence of humanity, is both a natural resource and a shelter for all other ecosystem creatures. However, especially in recent years, the increase of misapplications and mistakes has increased the rate of erosion and has paved the way for global problems such as climate change and migration (Tüfekçioğlu et al.,2016).

Considering the recent global epidemic of problems that threaten humanity, it has once again been revealed that the danger of erosion is closely related to all living beings, especially human beings. Therefore, it is vital that erosion, which constitutes one of the main sources of global risks, escapes from the agenda of humanity, and that it is always in the focus of attention and serious measures are taken. From this point of view, it is of great importance that academic circles, which are expected to make significant contributions, are involved, regardless of their area of expertise, and take a task. The research, which reveals different disciplinary approaches based on all these thoughts, aims to evaluate the situation on Göbekli Tepe, one of the great and popular discoveries of human history, and to present an irreversible problem such as erosion, which is closely related to all living things on the planet, as the focus of attention.

Possible landfill scenarios in Göbekli Tepe

The discovery of Göbekli Tepe required the reconsideration of what is known in the name of human history. While this evaluation enabled the answers of some questions to be obtained more clearly, it left the answers of some questions at the probability level. One of the questions remaining at the level of estimation in question, which is quite intriguing, was how Göbekli Tepe was undergrounded. Because, the answer to this question constitutes an important step for the interpretation of later periods. Based on this, research, analysis and interpretations have gathered Göbekli Tepe's landfill scenarios in two main views. These are discussed in detail below; it is expressed as opinions formed that it is filled with erosions or by human hands.

As can be seen in Figure 2, the cross (a) and lateral (b) sections of the soil fill layer clearly reveal that it consists of soil and stone materials with different grain diameters. When this situation is considered fictional, the process in Figure 2 and the sequential formation that will occur afterwards (Figure 3. - I, II, III and IV) suggests a similar model. Therefore, all these evaluations appear as sources that reveal and support the idea of erosion. Besides erosion, possible factors such as tectonic, volcanic movements and climatic changes bring to mind the lives of people who lived here resulting in migration. But most importantly, it emphasizes once again the unchanging destiny programming of erosion that deeply affects human life.



Figure 2. Front (a) and side (b) cross section of fillings.

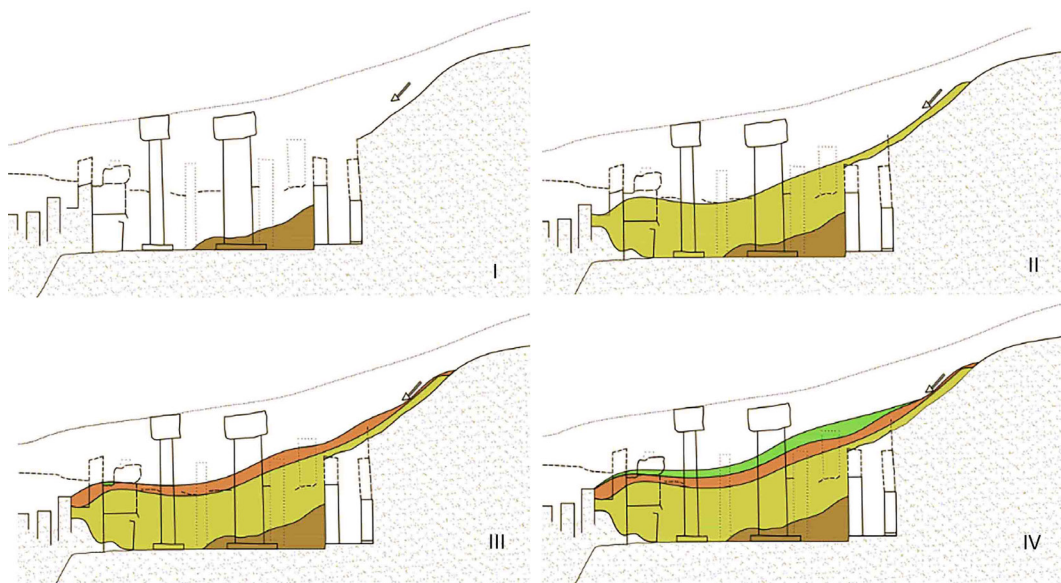


Figure 3. Göbekli Tepe's filling with possible erosion.

While today's people can control factors such as climate and geography at a certain level, this was not possible in prehistoric times. In order to provide a partial solution to this impossibility, areas with lower altitudes than their surroundings were deemed more suitable and preferred in terms of living conditions. In addition to being convenient in terms of water resources compared to high regions, factors such as reducing the damage of people from harsh climatic conditions constituted the main reasons for preference (Erol,1971). Similar approach also revealed that the place of establishment of Göbekli Tepe was not randomly determined. Based on these considerations, it remains within the possibilities that Göbekli Tepe acted in accordance with the approach specified in the

location selection. Its current location reveals that it is on the slope of the hill next to it, and provides limited support for this possibility (Figure 4).

Mentioning these preliminary reasons as well as some other supporting data strengthens the idea of erosion. The foremost of these ideas is water, which has never lost its vital importance for the continuity of vital activities throughout human history. The cisterns found during the excavations in the area and the transmission channels carved into the rock for water discharge are among the important findings regarding water (Herrmann et al.,2018). Therefore, all initiatives related to water, including the water collection holes in the rock shown in Figure 5, suggest that Göbekli Tepe was made for long-term

use. Another finding is the rock-cut pit structure, which is quite deep and large in shape, located in the northwest section (Clare et al.,2015). This structure, which is the largest ever found (Figure 6) and its recent discovery, the channels through which water is transmitted through these cisterns point to another aspect of strategic issues such as water supply and storing rainwater in the Neolithic period (Dietrich et al.,2014).

In addition, the carefully prepared special floor, whose existence is encountered in the outer surface area of the area, covered with small mosaic stone-like material known as terraso (Figure 7), suggests that the people who lived here actually used Göbekli Tepe not as a temporary place, but permanently.

Recent research has focused on the filling material in the building. The main reason for this is that it sheds light on the

view that the building was filled in natural ways, contrary to the view that it was consciously filled by humans in the first years. Because the detailed research results make it necessary to reconsider the idea that it was filled by human hands. The analyzes made on the filling material show that the filling in the area occurs more than once, not once (Clare et al.,2019). Hence, according to the data obtained as a result of radiocarbon measurements and the determination that they came from the slopes can be seen as signs of small-scale erosions in different periods in the area (Clare,2020). Therefore, it is believed that the surrounding slopes into Göbekli Tepe are filled as a result of the flow (erosion) of various materials, especially soil, and is associated with natural events such as rain, wind or earth movements.



Figure 4. The picture showing the location of Göbekli Tepe on the slope.



Figure 5. Hollows made to collect water.



Figure 6. Hollow structure carved into the rock (Clare et al.,2019).



Figure 7. Terraso floor.

The second important theory about Göbekli Tepe's landfill is that it was filled by human hands. Although the idea of erosion has gained weight according to the latest information obtained by experts, it also suggests that the area was filled with human hands before it was abandoned by those who used it. The first reason that suggests this view is the knowledge that such practices were applied in some neolithic settlements that can be considered contemporary, especially in the Çayönü settlement (Özdoğan and Özdoğan,1998).

Some archeology experts constitute an important part of the ideas that support that Göbekli Tepe was filled in later years due to possible reasons such as not being damaged or used by others. The first of these experts is Klaus Schmidt, who carried out the first and long-term studies in the region. In his view, the interior of the building was deliberately filled and closed in the Neolithic period. He explains this idea by the fact that the relief decorated T-shaped obelisks that characterize Göbekli Tepe were not damaged or intervened in the following processes

(Schmidt,2011).

According to another research conducted; although the geological structure of the region is composed of limestone and basalt, the first layer where the remains are composed of soft soil and the presence of stone tools in the same layer suggests that Göbekli Tepe was consciously covered with soil, not naturally (Kurt,2017).

Conclusions and Recommendations

Mankind has always looked at the past as well as its future with great curiosity and evaluated it as one of the important research topics. This search sometimes made him happy with great inventions and sometimes disappointed. However, in both cases, he used the data he obtained from the discoveries and tried to decipher his past memory. Göbekli Tepe, which is regarded as one of the most important discoveries of recent years, has caused great excitement on humanity even with the detection of the first findings of its existence. The historical structure has presented us with the information it has kept, as if fulfilling the necessity of meeting with such excitement, and opened its doors to new ones. However, the process of thousands of years has not made access to some information beyond just the level of theory. This situation did not pose a great obstacle for the enthusiast, and by trying different scientific methods and possibilities, it further stimulated the stubbornness of humanity, one of the leading virtues. Thus, the curiosity of the people living in the information age for Göbekli Tepe has increased even more, and new research topics have emerged. One of these research topics has been about Göbekli Tepe's filling scenarios.

The researches have collected the filling scenarios of Göbekli Tepe under two important theories. While the thought that it was filled with erosion has gained more weight in recent years, the findings and interpretations that it was filled with human hands have remained at a certain level, although not negligible. However, some experts who believe that the search for the future with the compass of the past will make great contributions will continue their research and perhaps reach different facts based on brand new findings. While seeking answers to these and many other questions, Göbekli Tepe, which has almost made a new beginning in human history with its discovery, continues to convey important messages to today's people and even its future as a requirement of its well-deserved reputation. One of these important messages is about the prevention of erosion, which will save us from great disasters in the future. Because researches on this subject confirm that all living things, especially human, living on the planet are on their way to great disasters. Our duty due to this situation will be to heed this cry from thousands of years ago and to take action for future generations even further.

Compliance with Ethical Standards

Conflict of interest

The authors declared that for this research article, they have no actual, potential or perceived conflict of interest.

Author contribution

The contribution of the authors to the present study is equal. All the authors read and approved the final manuscript. All the

authors verify that the Text, Figures, and Tables are original and that they have not been published before.

Ethical approval

Ethics committee approval is not required.

Funding

No financial support was received for this study.

Data availability

Not applicable.

Consent for publication

Not applicable.

Acknowledgements

For their contributions to the study; endless thanks to Harran University Rector Prof. Dr. M. Sabri Çelik, to Harran University Göbekli Tepe working group, to Göbekli Tepe Science Board Member and Head of Karahantepe Excavation Prof. Dr. Necmi Karul and to MSc. Arch. Esra Tuğalan.

References

- Atar, B. (2017), 'The Journey of Our Food Wheat, formerly to the Future', University of Suleyman Demirel Yalvac Academy Journal, 2 (1): 1-12. Retrieved from <https://dergipark.org.tr/tr/pub/yalvac/issue/32621/335464>
- Baykal, H. and Baykal, T. (2008), 'Environmental Problems in a Globalizing World', Mustafa Kemal University Journal of Social Sciences Institute, Vol:5, Issue:9. Retrieved from <https://dergipark.org.tr/tr/pub/ijshs/issue/39160/460862>
- Blanco, H. and Lal, R. (2008), 'Principles of Soil Conservation and Management', Springer, pp. 493. Doi: <https://doi.org/10.2136/vzj2009.0110br>
- Clare, L., Dietrich, O. and Notroff, J. (2015), 'Göbekli Tepe-Türkei, Die Arbeiten der Jahre 2014 (Herbst) und 2015', e-Forschungsberichte des DAI, 3: 149-151. Retrieved from <https://publications.dainst.org/journals/index.php/efb/article/view/1644/4551>
- Clare, L., Kinzel, M., Sönmez, D. and Uludağ, C. (2019), 'Göbekli Tepe: UNESCO Dünya Miras Alanı ve Değişen Yaklaşımlar', Journal of Architecture, 405. Retrieved from <http://www.mimarlikdergisi.com/index.cfm?sayfa=mimarlik&DergiSayi=419&RecID=4613>
- Clare, L. (2020), 'Göbekli Tepe, Turkey: A brief summary of research at a new World Heritage Site (2015-2019)', Berlin: Deutsches Archeologisches Institut. Retrieved from <https://publications.dainst.org/journals/index.php/efb/article/view/2596/7095>
- Çanga, M.R. (2016), 'Kişisel Akademik sayfası, Toprak Erozyonu ders notları-pdf'. (in Turkish). Retrieved from <http://cv.ankara.edu.tr/duzenleme/kisisel/dosyalar/09022016131015.pdf>
- Dietrich, O., Schmidt, K., Kürkçüoğlu, C. and Notroff, J. (2014), 'Göbekli Tepe: Preliminary Report on the 2012 and 2013 Excavation Seasons', Neo-Lithics, Vol:1/14, pp. 11-17. Retrieved from https://www.exorientale.org/repository/NEO-LITHICS/NEO-LITHICS_2014_1.pdf
- Erol, O. (1971), "Geomorphological Evidence of the Withdrawal Phases of Pluvial Lakes in the Konya, Tuzgözü and Burdur Basins", Ankara U.D.T.C.F., Journal of Geographical Studies, Ankara, (3-4). (in Turkish).
- Gül, F. (2013), 'Environmental Problems and Philosophy in the Context of Human-Nature Relationship', Pamukkale



- University, *Journal of Social Sciences*, Issue:14, p. 17-21. Retrieved from https://www.journalagent.com/pausbed/pdfs/PAUSBED_6_14_17_21.pdf
- Herrmann, R. and Schmidt, K. (2012), 'Göbekli Tepe – Untersuchungen zur Gewinnung und Nutzung von Wasser im Bereich des steinzeitlichen Bergheiligtums', Verlag Marie Leidorf GmbH, Rahden/Westfalen, pp. 57-67.
- Karabıçak, M. ve Armağan, R. (2004), "Emergence of Environmental Problems, Foundations of Environmental Management and Its Economic Effects", Süleyman Demirel University Faculty of Economics and Administrative Sciences, 9(2): 203-228. Retrieved from <https://dergipark.org.tr/tr/pub/sduiibfd/issue/20842/223417>
- Kayan, A. (2018), 'Raising Awareness to Environmental Issues through Education', *Journal of Awareness*, (3), special issue. Retrieved from <https://dergipark.org.tr/tr/download/article-file/662246>
- Kurt, A. O. (2017), 'The First Temple in Anatolia', *Cumhuriyet Theology Journal*, 21(2): 1107-1138. Doi: <https://doi.org/10.18505/cuid.334942>
- Orgiazzi, A. et al. (2016), 'Global Soil Biodiversity Atlas', European Union, (Luxembourg, pp. 128-129. Doi: <https://doi.org/10.2788/799182>
- Özdoğan, M. and Özdoğan, A. (1998), 'Buildings of Cult and the Cult of Buildings, G. Arsebük et al. (edt), *Light in Karatepe*', Ege publications, Istanbul, pp. 581-593.
- Pimentel, D. and Kounang, N. (1998), 'Ecology of Soil Erosion in Ecosystems', *Ecosystems*1, pp. 416-426.
- Schmidt, K. (2011), "Göbekli Tepe Excavation 2010 Report, 33rd Excavation Results Meeting', General Directorate of Cultural Heritage and Museums Publication No:155-3, Ankara.
- Tüfekçioğlu, M. and Yavuz, M. (2016), "Estimation of Surface Erosion, Soil Loss and Erosion in Yusufeli Micro-Catchment (Artvin), University of Artvin Coruh, *Journal of the Faculty of Forestry*, 17 (2): 188-199. Doi: <https://doi.org/10.17474/acuofd.47342>
- Yenigün, İ. (2017), 'Environmental History in the Light of Current Comparative Evaluations', PhD Thesis, University of Harran, Institute of Science, Sanliurfa, pp. 140.