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Usage of Ineffective Mining Quarries for Recreational Purposes: The Case Study of Burdur City, Turkey

Latif Gürkan KAYA, Cengiz YÜCEDAĞ*, Bora BİNGÖL

Mehmet Akif Ersoy University, Faculty of Engineering and Architecture, Burdur-TURKEY

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✉ *Sorumlu Yazar (Corresponding author): yucedagc@gmail.edu.tr*

☎ +90 248 2132785 📠 +90 248 2132704

ABSTRACT

The extraction of the mine resources is crucial for the industrial development of the countries. In this sense, the mine resources obtained by means of different methods should be presented to the service of the countries. However, considerable changes occur in the topography as a result of the used methods during the extraction processes of the mine. Although mining seems as a threat for the sustainable use of natural resources, the mining areas can be reclaimed after mining and they can be used for recreational purposes because they have interesting surface shapes and the underground galleries are interesting to the people. In Turkey, there are many mining quarries that have been abandoned without reclaiming after completing their mining activities. These quarries need to be reclaimed by the relevant institutions of the state without wasting time. In the current study, proposals about recreational use possibilities are made and concept design are drawn for opencast mining that have completed its economic value in Burdur city depends on its topographical structure.

Keywords: Burdur, Reclamation, Mining Quarries, Recreation

Atıl Maden Ocaklarının Rekreatyoneel Amaçlar için Kullanımı: Burdur Kenti Örneği

ÖZ

Maden kaynaklarının çıkarılması ülkelerin endüstriyel gelişimi için son derece önemlidir. Bu anlamda, farklı yöntemlerle elde edilen maden kaynaklarının ülkelerin kullanımına sunulması gerekmektedir. Ancak, maden çıkarma işlemleri sırasında kullanılan yöntemlerin sonucu olarak topoğrafyada büyük ölçüde değişiklikler meydana gelmektedir. Madencilik faaliyetleri doğal kaynakların sürdürülebilir kullanımı açısından bir tehdit olarak görülmesine rağmen, maden alanlarının ilginç yüzey şekillerine sahip olmaları ve yeraltı galerilerinin insanlar için ilginç görünmeleri nedeniyle bu alanlar madencilik faaliyetlerinden sonra geri kazanılabilir ve rekreatyoneel amaçlar için kullanılabilirler. Türkiye'de madencilik faaliyetleri tamamlanmış ve geri kazanılmadan terkedilmiş birçok maden ocağı bulunmaktadır. Bu maden ocaklarının zaman kaybedilmeden devletin ilgili kurumları tarafından geri kazanılmasına ihtiyaç vardır. Bu çalışmada, Burdur kentinde ekonomik ömrünü tamamlamış iki açık maden ocağı için topoğrafyalarına uygun olarak rekreatyoneel kullanım olanakları hakkında öneriler getirilmiş ve avan projeleri çizilmiştir.

Anahtar Kelimeler: Burdur, Geri Kazanım, Maden Ocakları, Rekreatyon

INTRODUCTION

The stone quarry sector has developed through the supply of the required raw materials from the mine quarries with the rapid increase of the population, destruction has increased, the balance of nature has been broken and new generations are left empty areas. The number of stone quarries has increased along with the open pit mines and these areas has been left without being repaired (Cındık and Acar, 2010). As a matter of fact, Acar (2007) reported that repair works in the mines is very little than expected, and that the destructed areas are much more than the recovery works. This abandonment is harmful to nature and all living things that it contains. The works in stone quarries that do not comply with the regulation resulted in many environmental problems such as rock slippage, noise and air pollution, ground vibrations and landslides (Cındık and Acar, 2010). However, it does not necessarily improve the quality of life. Despite the many advantages of developed environments might be closely related to the negative health outcomes, which is supported by an increasing body of research. Some of studies reported that decreasing in indoor air quality directly affects human health and performance (Cetin and Sevik 2016a; Cetin and Sevik 2016b; Cetin and Sevik 2016c; Cetin 2016; Sevik et al., 2017).

There are many mining quarries in Turkey that have been abandoned and have not been repaired. These quarries need to be restored to nature by the state without wasting time. These applications should be presented to the public as well as to the mining industry as sample applications (Düzgün, 2016). The fact that every transaction made in the country has an effect on the surrounding areas. As it is known that every process carried out in nature has an effect on the environment, the cost of traveling in more beautiful ways and sheltering in more beautiful places is that the environment is influenced by these activities on a certain scale. It is important to understand that these processes are carried out for a temporary period and that environmental destruction due to production activities caused can be removed (Karaman, 2010).

Repair works of mine quarries is the reconstruction and establishment of the damaged ecosystems beyond an improvement work (Acar, 2007; Topay and Koçan, 2007). Repair works should be compatible with the landscape, it must restructure biological efficiency, increase visual landscape value, improve social and

economic conditions of the district, and also present solutions for environmental problems such as air, water and soil pollution (Akpınar et al., 1993; Bauer, 2000). In the planning for the recovery of the area, ecological, economic and aesthetic plan decisions must be made (Topay and Koçan, 2007). Some study shows that the area is considered recreational attraction for not use. Recreation services can be determined regarding protection according to the land management and land use planning (Cetin and Sevik 2016a). In this context, the repair works of the mine quarries constitutes the land structure before its deterioration or presents the new use forms for the destructed land. Recreation is one of these use forms. Reconstruction of the quarries, which have completed the material procurement process and are close to the city, for recreational purposes is one of the "most rational" ways to be preferred for recovery. Especially reconstruction of mine quarries that are close to the city for recreational purposes will provide positive effects on social, physiological and psychological structure of people (Topay and Koçan, 2007).

Based on this information, in the current study, the recreational use of two open mines that have completed their economic life in the vicinity of Burdur city center has been investigated.

MATERIAL AND METHOD

In this study, two open mine completed their economic life in the vicinity of Burdur city center were determined as material after examining the information about Burdur city, the studies completed about city and the statistical and visual data on the internet (Figures 1-2).

Case area 1 located on the Antalya-Burdur D-350 highway and in the eastern part of the Faculty of Health Sciences of Mehmet Akif Ersoy University was open-air having marble with no economic value (Figures 3-4).

Case area 2 located to the east part of the village of Kurna, Burdur center's town, was a sand quarry (Figure 2, 5-6).

Considering the recreational needs of the people in Burdur and the interviews realized with the specialists, landscaping designs including recreational areas of activity such as picnic areas around water lands, roadside recreation areas, viewing terraces, hiking and cycling trails etc. were realized in the case areas.

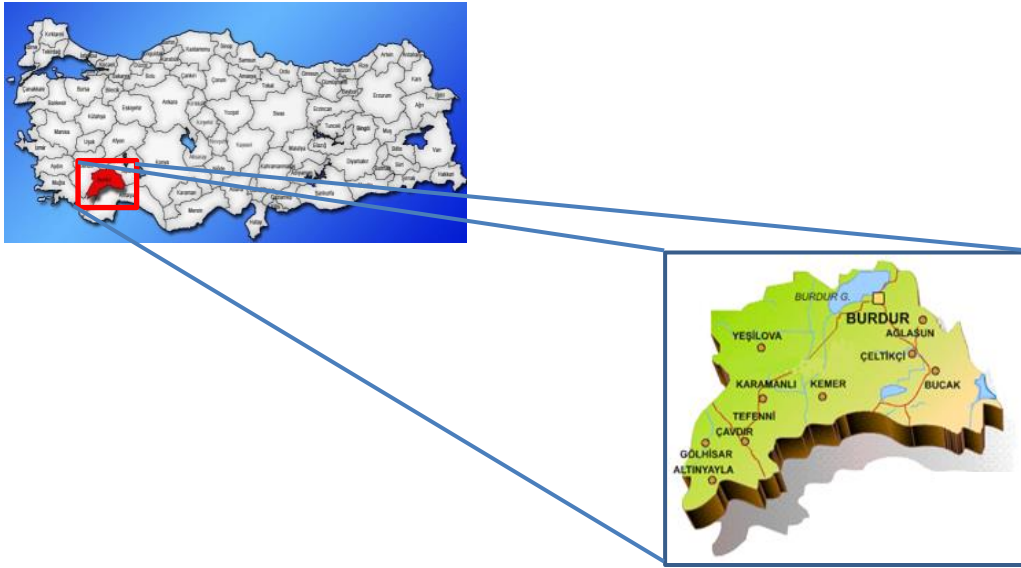


Figure 1. Location of Burdur in Turkey



Figure 2. Case Areas

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Figure 3. Case Area 1



Figure 4. Views from Case Area 1



Figure 5. Case Area 2



Figure 6. Views from Case Area 2

RESULTS AND DISCUSSION

Figures 7 and 9 reveals case areas before designs. Landscape concept designs for case areas are given in Figures 8 and 10. Despite the fact that the quarries are

visually polluted and they open the gaps in the natural structure, it has thought that they will have recreative and biotope potentials after mining activities complete if they are initially planned (Oğurlu et al., 2014).



Figure 7. A view of the Case Area 1



Figure 8. Concept Design of the Case Area 1

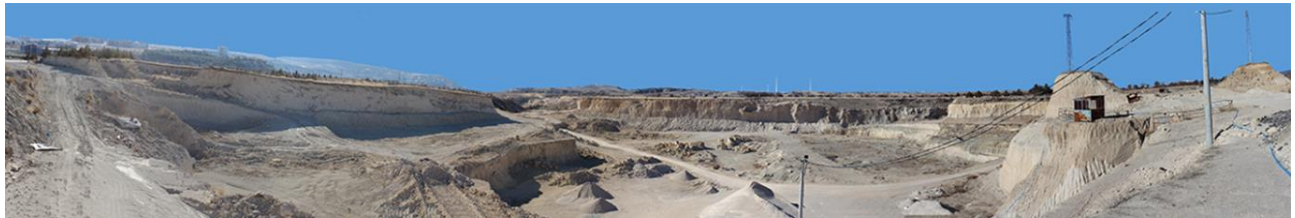


Figure 9. A view of the Case Area 2



Figure 10. Concept Design of the Case Area 2

So far, many researchers have proposed various recreational activities for mine quarries whose management has ended. Karaman (2010) studied two quarries sites of Turkish Republic of Northern Cyprus, a gypsum open-pit area which is located in Kurtulus District, İskele and a limestone open-pit area which is located in Dikmen-Bogazkoy of Kyrenia District and reported that the reclamation plan prepared for gypsum open-pit site in İskele has been realized whereas the reclamation plan for the limestone open-pit site located in Kyrenia

has been designed but not realized yet. Özcan (2009) examined that, six alternatives that are forestation, private forestation, hobby gardening, settlement, industry and recreation, by approaching repair works compatible with urban use, to check if they are suitable for the area and made the decision upon the land use with the help of Analytical Hierarchy Proses (AHP). He found that the area is proper for forestation and private forestation in accordance with the decision upon the land use.

Seçkin and Yayım (2006) emphasized that landscaping planning decisions should be taken in order to transform the open-mine quarry of İstanbul Ağaçlı region into green areas that allow a wide range of recreational activities. Turnacıgil (2008) also suggested rehabilitation through afforestation for the Yeniköy open mine area. Ulusoy and Ayaşlıgil (2012) stated that it would be more appropriate to use forests and recreational purposes for the open mine area in Şile-Avcıkoru because open mine area is a forest land before mining and thus the natural ecosystem in the area would be recreated.

The most effective way to improve the best use potential after production activity of a mining area is to coordinate the use of mining equipment, earth materials, and deposits resulting, depending on whether the mining area is settlement, habitat or free space. To be effective, this process must be made before the beginning of mining activities. In addition, it is necessary to understand the characteristics of the district, the mining area, the deposit and the operations in detail (Bauer, 2000). Local authorities, on the other hand, should support the restoration projects in these areas to protect the natural habitats, rare and endangered species in the abandoned mine quarries (Gentili et al., 2011).

CONCLUSIONS

In the study, the designs made by considering the recreational needs of people in Burdur City will contribute to their social and cultural structure. As a result, the negative effects of mining quarries on the environment can be overcome by rehabilitation works. However, it should not be forgotten that planning of this rehabilitation works will be more beneficial before mining activities begin. It is also crucial for the sustainability of natural resources to pass the laws and regulations required for before and after mining activities promptly.

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KAYNAKLAR

- Acar, D.Ö. (2007). Türkiye’de Açık Ocak Kömür Madenciliği Sonrası Peyzaj Onarım Çalışmalarının İrdelenmesi. Ankara Üniversitesi Fen Bilimleri Enstitüsü Yüksek Lisans Tezi, Ankara.
- Akpınar, N., Kara, D., Ünal, E. (1993). Açık Ocak Madenciliği Sonrası Alan Kullanım Planlaması. Türkiye XIII. Madencilik Kongresi, 10-14 Mayıs 1993, s. 327-340, İstanbul.

- Bauer, A.M. (2000). Reclamation Planning of Pits and Quarries. LATIS, Washington, DC, USA.
- Cındık, Y., Acar, C. (2010). Faaliyeti Bitmiş Taş Ocaklarının Yeniden Rehabilitasyonu ve Doğaya Kazandırılması. Artvin Çoruh Üniversitesi Orman Fakültesi Dergisi, 11 (1): 11-18.
- Cetin M (2016), A Change in the Amount of CO₂ at the Center of the Examination Halls: Case Study of Turkey, Studies on Ethno-Medicine 10 (2), 146-155.
- Cetin M and Sevik H (2016a) Evaluating the recreation potential of Ilgaz Mountain National Park in Turkey. Environ Monit Assess (2016) 188:52
- Cetin M and Sevik H (2016b), 2016, Measuring the Impact of Selected Plants on Indoor CO₂ Concentrations, Pol. J. Environ. Stud. Vol. 25, No. 3 (2016), 973-979.
- Cetin M., Sevik H. (2016c) Change of air quality in Kastamonu city in terms of particulate matter and CO₂ amount. Oxidation Communications 39, No 4-II, 3394–3401 (2016).
- Düzgün, H.Ş. (2016). Maden Kapatma Planlaması ve Doğaya Yeniden Kazandırmanın Temel İlkeleri. http://users.metu.edu.tr/duzugun/madencilik_cevre_duzgun.pdf.
- Gentili, R., Sgorbati, S., Baroni, C. (2011). Plant Species Patterns and Restoration Perspectives in the Highly Disturbed Environment of the Carrara Marble Quarries (Apuan Alps, Italy). Restoration Ecology, 19: 32-42.
- Karaman, B. (2010). Açık Ocak Madenciliği Sırasında Bozulan Sahaların Yeniden Düzenlenmesi ve KKTC’de Bazı Uygulamalar. Çukurova Üniversitesi Fen Bilimleri Enstitüsü Yüksek Lisans Tezi, Adana.
- Oğurlu, İ., Aksu, G.A., Sözgen, Ö.T. (2014). İşleyen ve İşli Bitmiş Taş ve Mermer Ocaklarının Peyzaj Rekreatyon ve Biyotop Tasarım Potansiyeli. Ulusal Mermer ve Taş Ocakları Onarım Teknikleri Sempozyumu, 18-20 Eylül 2014, s. 227-241, Isparta.
- Özcan, A.U. (2009). Ankara-Hasanoğlan Taş Ocaklarının Onarımı ve Kentsel Kullanım Açısından Değerlendirilmesi Üzerine Bir Araştırma. Ankara Üniversitesi Fen Bilimleri Enstitüsü Doktora Tezi, Ankara.
- Seçkin, Ö.B., Yayım, Ş.D. (2006). Taş ve Maden Ocağı Alanlarının Rehabilitasyonu Olanakları (İstanbul Ağaçlı Yöresi Açık Maden Alanı Örneği). İstanbul Üniversitesi Orman Fakültesi Dergisi, 56: 1-9.
- Sevik H., Cetin M., Guney K., Belkayali N. (2017). The influence of house plants on indoor CO₂. Polish Journal of Environmental Studies. 26(4), DOI: 10.15244/pjoes/68875
- Topay, M., Koçan, N. (2007). Ekonomik Ömrünü Tamamlamış Açık Maden Ocaklarının Rekreatyonel Amaçlarla Düzenlenmesi. Türkiye 20. Uluslararası Madencilik Kongresi, s 187-195, Ankara.
- Turnacıgil, A. (2008). Yeniköy Ağaçlı Civarındaki Maden Ocaklarının Rehabilitasyonu. İstanbul Teknik Üniversitesi Fen Bilimleri Enstitüsü Yüksek Lisans Tezi, İstanbul.
- Ulusoy, Y., Ayaşlıgil, T. (2012). Açık Maden Ocaklarının Rehabilitasyonu ve Doğaya Yeniden Kazandırılmasının “Şile-Avcıkoru” Örneğinde İrdelenmesi. İstanbul Üniversitesi Orman Fakültesi Dergisi, 62: 21-36.