Sustainability of Visual Landscapes: A Case Study from Suğla Lake, Turkey

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Abstract: The purpose of this study is to determine and evaluate the sustainability of landscapes of highest visual quality in the vicinity of Suğla Lake located in Konya Province in Turkey. The Scenic Beauty Estimation Method, based upon showing representative photographs of visual landscape types to participants, was used in the study. The method-including three stages (e.g. development of a questionnaire)- was implemented by using data obtained from 104 individuals at two universities. As a result of this assessment (based upon 1-6 scale evaluation), eight visually rich landscape types were determined in accordance with the preferences of the participants. The main parameters in selecting these landscape types were "naturalness" and "vividness". Assessment of the major components of each landscape type and the relations between the components (based upon 1-4 scale evaluation) showed that the main components forming the visual quality for each landscape type were "vegetation type" and "degree of naturalness". Finally, two approaches (e.g. eco-aesthetic) were discussed for providing the sustainability of the landscapes with the highest visual quality in the region.

Key words: Sustainability · Visual landscapes · Planning · Visual landscape assessment · Visual landscape quality

INTRODUCTION

Visuality is one of the major components of landscapes (e.g. physical and cultural) (Landscape Institute, 2002). This concept has been discussed by different scholars (e.g. philosophers, designers and environmental planners) [1]. The concepts of visuality and visual landscape are related to the issue of aesthetics and cover both objective and subjective assessments. According to objective evaluation, "aesthetic quality is included in the intrinsic qualities of individuals"; that is-beauty is inherent in objects. According to subjective evaluation, "aesthetic quality is in the mind or in the vision of individuals"; that is beauty is in the eye of beholder [2]. Within this context, aesthetic quality is directly related to the concept of perception which can be defined by parameters such as sound and colour [2, 3]. Visual landscapes are formed by a range of abiotic (e.g. topography), biotic (e.g. vegetation cover) and cultural components (e.g. traditional culture) [2, 4].

Visual landscape-formed by the components indicated-expressed as "aesthetic satisfaction and the pleasure that individuals obtain from any landscape type (e.g. happiness, vision and sound)" [4]. Visual landscape quality reflects the impressions of an individual observing the physical features of a landscape through perceptual processes (e.g. sense and perception) [5-6]. Visual landscape assessment expresses the preference of one landscape characteristic over another [2]. Perception and assessment of visual landscapes change subjectively between individuals and communities [7]. For example, while major evaluation criteria for visual landscape assessment in developed countries are ecological and recreational values of landscapes, major evaluation criteria in developing countries are provision of food, income generation, traditional culture and cultural

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identity [8, 9]. Accordingly, visual landscape is a dynamic entity [10] and its sustainability is important to conserve national resources and cultural heritage.

The visual quality of a landscape depends on the abundance levels of numerous elements (e.g. water and mountain). The major components encompassed in visual landscape quality are water, degree of naturalness, vegetation cover, topography, colour and relevant diverse features. The degree of naturalness of a landscape is its ability to sustain itself without anthropogenic interference [7]. The degree of naturalness and also visual landscape quality is declined by the increase of man-made elements (e.g. roads and power lines) [2]. Diverse topography (e.g. hilly areas with slopes) in a site contributes its visual quality [11]. Type and diversity of vegetation cover increases the visual quality. Areas covered with forests and mixed vegetation enrich the visual landscape quality. Existence of water (e.g. natural lakes and streams) and a variety of colours contribute to the visual quality [12, 7, 2]. Within a visual landscape, although a range of man-made positive elements (e.g. historical and archaeological elements) increase visual quality; there is a negative relationship between man-made elements and visual quality [12]. Accordingly, the visual landscape quality declines when human influences on nature increase. The components defined can lead to perceptions such as mystic, impressive, vivid and harmonious [7, 5].

Landscapes with the highest visual qualities provide valuable aesthetic, ecological, cultural, recreational and economic benefits for human well-being [5, 4]. Therefore; we should integrate such landscapes within landscape planning in order to sustain their benefits. Accordingly, the purpose of this study was to determine and evaluate the sustainability of landscape types with the highest visual quality in the vicinity of Suğla Lake located in Konya Province in Turkey.

MATERIAL AND METHOD

Study Area: The study area Suğla Lake and its surrounding landscapes is located in Konya Province of Turkey (31° 52' 43''-32° 16' 02'' east meridians and 37° 10' 46''-37° 29' 46'' north latitudes) and covers a 74.15 ha area [13] (Fig. 1).

The study area is in the transition belt of the Mediterranean and Iran-Turan pytogeographic regions between the Mediterranean and Central Anatolia Regions. The change in its topography in a short distance creates microclimatic areas and enriches landscape diversity housing different ecosystems (e.g. forests, plateaus, wetlands and streams). The Suğla Lake is a tectone-karstic lake. Its elevation from sea level is 1040 m, its surface area is 13.50 ha. The surrounding area of the Suğla Lake includes productive agricultural landscapes and rural settlements [13].

METHOD: Numerous methods and theories have been devised in the field of landscape perception and visual quality assessment. The approaches can be classified in two categories:

- Expert approach: It includes both quantitative and qualitative methods of evaluating scenic landscape resources by analyzing and describing their components which are mostly applied by experts in an objective manner (e.g. ecological models) [14]. The advantage of such methods is that studies are carried out in a scientific manner; however, public preferences and citizen participation are often neglected.
- Public preference approach: Methods (e.g. Scenic Beauty Estimation method) in this approach are based on subjective assessment of scenery and attempt to encompass the diverse and changing perceptions of individuals are likely to be most successful [15]. Questionnaires are the most commonly used non-quantitative method for sampling scenic preference of various groups [14]. Advantages of these techniques are that public preference and citizen participation are considered in studies.

The Scenic Beauty Estimation (SBE) method-the most widely used one-was chosen for determining and evaluating landscapes with the highest visual quality in the study area. The method was developed by Daniel and Boster in 1976. Major reasons for the choice of the SBE are that perception of people and public participation are considered in this method. The SBE method proved the importance of the human context in which landscapes are encountered [15]. In addition; perception of people has been emphasized in the European Union Landscape Convention adopted in 2002 [16]. This definition implies that landscape protection, planning and management should be based on people's views and support citizen participation. We considered that the local people are the main users and managers of the landscapes in the study area; therefore, their judgments and engagement is

necessary not only for ethical right but also for contributing to improved quality of decision-making, enhancing the societal behavior on landscape quality and reducing conflicts. For this reason, the aim of the study and method used were introduced to the local people; however, assessment of the study was conducted in the universities due to high degree of literacy among the local people.

The SBE method is based on showing representative photographs of visual landscape types to participants. Thus, visual landscape types with the highest visual quality are determined according to their preferences [5]. The steps are explained below.

- Photograph selection for visual landscape quality assessment: The expert of landscape architects chose 588 photographs representing the existing landscape types. These photographs were taken by them during three field studies (31 October-2 November 2008; 11-15 May 2009; 3-7 August 2009). The settlements are spread over a large area in the study site. For this reason, the landscape architects primarily examined visual landscape types within three criteria:

- Diversity of objective and subjective visual landscape components;
- Inspiring an observer to come back to the site, in other words, raising awareness and evoking the sense of memorability;
- Being an attractive place for recreation initiatives.

As a result of evaluating these criteria, the experts defined 8 main visual landscape types in the study area: valley, mountain, plateau, water dominated, pasture, geomorphologic formation, agricultural and rural landscape. Then, they selected 4 photographs representing each visual landscape type in order to prepare a Power Point presentation. Major criteria for selecting the photographs were the diversity of components increasing visual landscape quality (e.g. water, vegetation cover, colour and traditional culture).

- Preparation and implementation of the questionnaire and Power Point presentation: This part of the method consists of two stages: field survey and photograph Power Point presentation. Both were implemented simultaneously.

The landscape architects previously examined 8 main visual landscape types defined above and their components in the study area. Then, they determined profiles of participants, landscape types with the highest visual quality and their components by a questionnaire in the universities. Each visual landscape type was rated using a 1-6 scale (1-represents the lowest and 6-the highest value) in accordance with vividness, naturalness, harmony, impressiveness and mystery criteria which were developed by literature review [2]. An average value of visual quality for each visual landscape type was estimated by using this evaluation. Components of each visual landscape type were defined in the second phase of the questionnaire. This evaluation was further developed by literature review [11, 17, 18] and field studies (Table 1).

At the second phase of the questionnaire, the landscape components given in Table 1 were evaluated using a 1-4 scale, where 1-indicating the lowest and 4-indicating the highest value in visual quality. For example, very mountainous areas-increasing visual landscape quality-are chosen over flat lands. During the survey, the 4 photographs representing the 8 visual landscape types were shown to the same participants using a Power Point presentation. Thus, the main criteria which were effective in selecting landscape types were questioned. A total of 32 photographs were evaluated by the participants. As most of the participants were not familiar with this issue, an explanation was given to the participants about the concept of landscape, visual landscape and its components, visual landscape assessment and evaluation criteria. However, they made their preferences independently. This approach did not cause any kind of disorder from the methodological point of view.

- Definition and assessment of landscape types with the highest visual quality: The questionnaire and Power Point presentation were conducted with 104 participants in Çanakkale Onsekiz Mart and Bartin universities. The data collected was processed using SPSS 15.0. Accordingly, landscapes with the highest visual quality, average value of visual landscape quality, components of the visual landscapes and their interrelations were examined only for this case study area.

RESULT AND DISCUSSION

Determination of the Landscape Types with the Highest Visual Quality: The landscape types with the highest visual quality in the vicinity of Suğla Lake were evaluated by the landscape architects conducted this study (Table 2).

The average value of visual quality, for each landscape type, was calculated from the total sum of values given by the participants (on 1-6 scale evaluation for the components of each landscape type) divided by the number of the participants. As a result, the average value of visual quality for each landscape type and dominating visual landscape criteria were determined (Fig. 2, Table 3).

Table 3 and Figure 2 show that the valley "Mavi Boğaz" (VP2), geomorphologic formation "Tınaztepe Mağarası" (JP3) and water dominated "Çatmakaya Yayla yukarı kesimleri" (SP4) landscapes had the highest visual quality in the study area. The major parameters for selecting these landscapes with the highest visual quality included "naturalness" and "vividness". Both reflect the self-sustaining ability of the landscape types, limited or absence of anthropogenic interference. This approach supports the findings of the scholar [4]. The major components of each landscape type and the relations between the components were evaluated by the 1-4 scale evaluation (see Table 1). This evaluation was conducted by the questionnaire and Power Point presentation (Table 4).

According to Table 4 dominating components in the preference of landscape types are coverage area and type of vegetation, degree of naturalness, existence of water and type of topography. They provide a dynamic structure for visual landscape characteristics. The most dominant component is the "degree of naturalness". The scholars [18] emphasized that validity of the ecological model (an expert approach) depends on the assumption that natural areas undisturbed by humans are highest in landscape quality. This finding shows that naturalness is an important criterion for landscape evaluation in both expert and public preference approaches. Accordingly, degree of naturalness, ecological integrity and visual quality are interrelated. Another component that increases the average visual landscape quality is the "existence of water". Average visual landscape quality increases where natural lakes and streams (e.g. VP2, JP3, SP4, DP1) dominate. This is the main reason why Mavi Boğaz (VP2) was selected with the highest visual quality in the study area. The existing of water leads to increasing naturalness in visual landscapes. We can assume that there is a positive interrelation between both components that contribute to increasing ecological integrity as well as visual quality. "Type and diversity of topography" are important components that enrich landscapes. Such areas are rich in vegetation cover. There is a positive interaction between the components of topography and vegetation cover. The landscape types with high visual quality (e.g. JP3, SP4, DP1) cover rich natural and cultural landscape characteristics (e.g. vegetation cover-colour-topographic diversity, naturalness and existence of water). For example, co-existence of *Coryllus* sp. and *Pictacia* sp. in Mavi Boğaz proves the climatic variety and rich vegetation cover. These findings indicate the continuation of ecosystem functions in the defined landscape types. The participants evaluated the agricultural landscape (TP2) within the context of "naturalness" parameter as the agriculture technique in TP2 is a traditional practice, adaptive with the environment and only practiced by a few of farmers in Bağyurdu village. The respondents evaluated the rural landscape (KP4), showing a rural building with a traditional rural woman, within the parameters of naturalness and positive man-made elements. This finding shows that the parameters of traditional culture, cultural identity and positive man-made elements increase the visual landscape quality.

The landscapes types with the highest visual quality are shows in Figure 3. Assessment of the ecological studies [13] carried out in the region shows that Mavi Boğaz (VP2), Çatmakaya Yayla Yuk. (SP4) and Çatmakaya Yayla (YP1) are located in the sites where biodiversity is high. Because of this, these landscapes are considered with high biodiversity function. Biodiversity is in moderate level in the other visual landscapes determined. Finally, the visual landscape types determined were integrated in the landscape planning procedure.

Unfortunately, a number of human influences (e.g. overgrazing and intensive agriculture) have serious impacts on the conservation and sustainability processes of visual landscape types. Thus, a series of measures are required for improving the visual quality in the study area.

CONCLUSION

The results of this study and the method used have contributed to integrating visual quality assessment in the landscape management procedures in Turkey.

The landscape types with the highest visual quality determined in this study were integrated into the landscape plan developed by the scholars [13].

The result of our assessment revealed that visual landscape quality is high in the areas where the degree of naturalness, which is a parameter in ecological model as well, is high. In addition, the parameter indicated shows that ecological processes and functions continue in the landscape types with the highest visual quality. According to the scholars [8, 10], the prevailing approaches regarding sustaining visual landscapes in Northern America and Northern Europe emphasize that continuation of ecological processes and functions in a landscape type and rehabilitating the natural environment is accepted as the sustainability of visual landscapes. Thus, the sustainability of a visual landscape is particularly dependent upon the naturalness of an area as the findings of this study revealed.

Visual landscapes with high visual qualities in European countries are protected and managed either as National Parks or IUCN Category V-Protected Landscape / Seascape [19]. Establishment of a legal protection status in Turkey would lead to protection of visual qualities of landscapes, generation of a model based on protection-use balance, revitalization of traditional resource management models.

Application of an "eco-aesthetic" approach within the landscapes with ecotourism potential would be beneficial. This approach is based on establishing a bridge/relationship between landscape design and landscape ecology. According to the findings of the scholars [8], people cannot directly see and sense the ecological qualities of landscapes, although they experience aesthetical satisfaction. Such a satisfaction would not include any information regarding the quality and status of ecosystems. Therefore an integrated approach of eco-aesthetic would be beneficial. The eco-aesthetic approach aims at integrating aesthetic satisfaction obtained from visual landscapes with the benefits of ecological functions. The findings of the scholars [8, 9] support this approach.

Consequently, the results of this study provide valuable information for land use planners and natural resource managers regarding the protection and sustainability of landscapes with high visual quality. Additionally, this method of study can be utilized in other regions for similar purposes.

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