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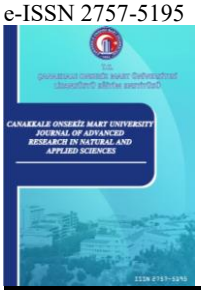

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"A Living River" of Çanakkale Sarıçay Region Examination in the Scope

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Abstract − Urban areas are social areas that make it necessary for societies with different cultures to live together. The majority of the world's population lives in urban areas. Especially with the industrial revolution, a large population flow has occurred from rural areas to urban areas. The large and congested population in the cities brings with it a low quality of life. For this reason, people cannot go further than their daily life routines. When we look at the development of civilizations historically, it is seen that the most important source for the sustainability of life is water borders. At the same time, water borders have given identity to the place where it is located as a natural resource such as streams and rivers. The rivers, which are located in the urban area and give an identity to the city, meet the needs of the users along with the protection-use balance, thanks to the recreational uses they offer. Within the scope of the study, a design project that can respond to recreational uses has been developed in Sarıçay and its immediate surroundings, which constitute an important ecological corridor of the city. Visual, natural and cultural environment analyzes were made with SWOT analysis of the area. The aim of the study was to restore the sustainability of Çanakkale Sarıçay and its surroundings to the city and to function it. It is predicted that the study will positively affect the quality of life in the city and the quality of life will increase.

Keywords *– Çanakkale, quality of life, recreation, stream, urban identity*

1. Introduction

Water is an indispensable need not only for humanity, but also for all living things. Most living things, especially humans, have lived in areas close to water sources. Therefore, most of the first settlements were established in areas close to natural water sources. (Koçan and Ankaralı, 2020). Throughout civilizations, water has been one of the most important factors affecting the shaping of settlements, and social life has been shaped by water. Streams are of great importance in the development of cities today as in the past. Flora, fauna, etc. Urban river areas with preserved natural features can be considered as a dominant natural landscape element that not only strengthens the image of the city with its visual and aesthetic values, recreational activities, transportation alternatives, but also affects the urban development formally (Bolu, 2007).

Streams, which are the most determining factor in the selection of the first cities in the formation of the first cities, play an important role in the cities today as much as they did in the past. They are important natural resources that provide many services such as easy access to clean drinking water, fertile lands for agriculture, natural transportation routes, and renewable energy. It has a great ecological importance due to the rich ecosystem it provides for fauna and flora (Brierley and Fryirs, 2009).

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As civilizations developed, people began to use and manage water more efficiently. They brought it from the natural water source with canals and used the water in their gardens for visual pleasure or agricultural purposes. Looking at the examples in the past, the only water source of the Egyptian Civilization, which was established around the Nile River, is the Nile River. The water they get from the Nile River has been important both for agriculture and for the ornamental ponds they have created. They obtained paper from the papyrus plant growing in the Nile River and transferred their entire lives to these papyrus papers. Today, the importance of streams and rivers has increased more. With the effect of streams and rivers, the form of the city was formed and a unique identity of the city was formed with the construction. Many examples are seen in European countries such as the Rhine, the Seine, and the Ron River (Gültekin, 1991).

The increase in urbanization with the industrial period has also revealed different sources of income such as transportation and trade. In addition to these elements, people have turned to recreational uses in order to meet their social needs. These uses have emerged in various forms throughout history. The possibilities provided by the rivers, which are fertile coastal areas in the cities in the recent past, have also transformed with the development and change of the cities. Over time, uses such as trade, transportation and providing food have become a necessity by serving their recreational purposes (Önen, 2007).

With the rapid population growth and the development of technology, the use of water by people has also diversified. Rivers, streams, etc. in the city periphery. water uses have been the primary target for the balance of protection and use of these areas while planning open recreation areas in the green area system of the city. Streams and rivers have undertaken important tasks such as creating suitable habitats for flora and fauna, regulating surface flows, improving microclimate, creating recreation areas and connecting land areas (Oktay, İşlek and Yaşar, 2016).

Yerli and Kesim (2009), emphasized that rivers provide an important benefit to the city with the recreational opportunities they provide to flora and fauna, as well as being an ecological corridor. At the same time, streams have an aesthetic, reflective and depth-creating effect. Water creates quality physical environments for people by enriching the place where it is located (TDK, 1998). Water in the city is an important planning and design element to ensure the realization of recreational activities. Water areas such as streams and rivers and their shores have many recreational opportunities. It offers many activities such as swimming, hunting, boat trips, walking, resting, observation and viewing terraces, and photo taking areas (Ankaralı, 2019). It is a known fact that a water source located in a closed and surrounded physical space affects people both physically and mentally in a positive way. In addition to these effects of water, spatial features can be enriched with vegetative and structural plans in design and planning studies (Hattapoğlu, 2004).

In this context, Sarıçay and its surroundings, which is an important focal point and ecological corridor of Çanakkale city, have been chosen as the project area in order to protect and develop the existing urban fabric from the past to the present. In addition, the inadequacy of the green space structure in the zoning plan poses an important problem for the city. Sarıçay and its surroundings have an important open green area value. With the proposed landscape design project, the open green space per capita in Çanakkale will increase this value with the solution proposals, and the existing pedestrian traffic will reduce the carbon emissions created by air pollution. After discussing the processes that will reveal the meaning of the design of the river in the city, the design criteria were discussed and the designs made in the country and abroad were examined and adapted to this study.

2. Materials and Methods

The study covers Sarıçay and its surroundings, where the Atatürk bridge is located in the center of Çanakkale (Figure 1), which is located in the Marmara region of Turkey. It has a length of about 501 meters, a perimeter of 1140 meters and an area of 22,770 m². The study area is located at latitude 40° 8'33.13"N, longitude 26°24'27.98"E.

Figure 1. Location of Çanakkale

Sarıçay, the study area, divides Çanakkale into two parts with a long corridor structure in Çanakkale city center. These two divided parts are connected to each other by certain bridges and a continuous axis is formed between the two parts (Figure 2).

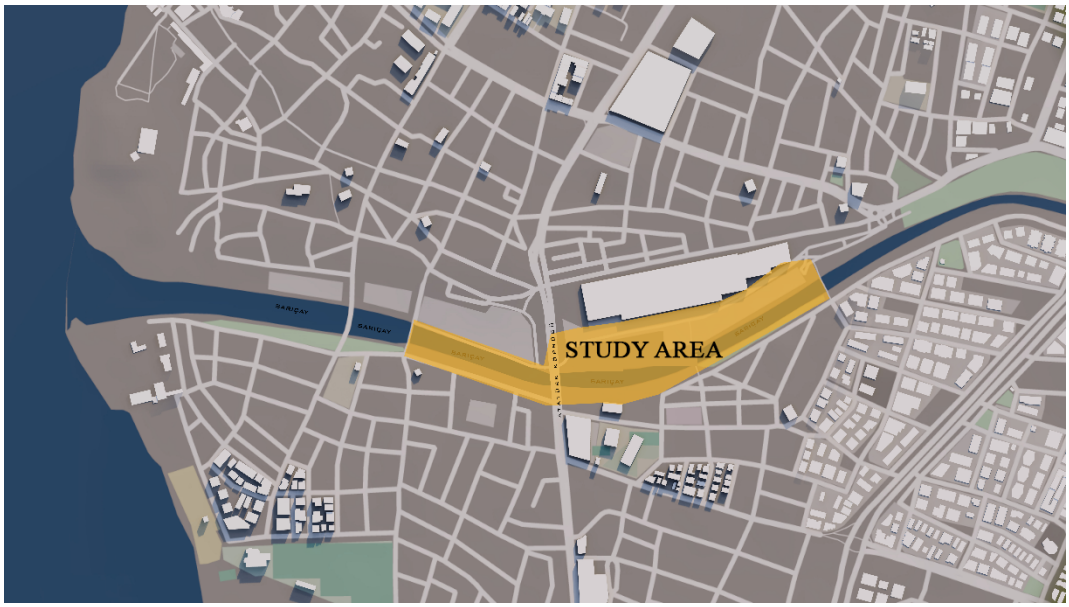

Figure 2. Location of the study area

For this reason, a three-stage method was followed in the study. Firstly, literature review and data collection, secondly, field study and SWOT analysis, and finally, usage suggestions and design phase were realized. In determining these stages, he benefited from the planning approach of McHarg (1969) and the plan decisions of Pekin (2007) for the creation of riverbank greenway plans.

2.1. Literature review and data collection

Considering climate change, a detailed literature study was conducted with the aim of an ecological design approach. In order to cover the design and planning stages, resources such as thesis, article, journal, book, internet related to rivers and the area were examined. As a result of the sources examined and the data obtained,

general information about the effects of rivers on the formation and development of the city, the use of water, the urban streams and the recreational use of water have been obtained.

2.2. Field study and SWOT analysis

In line with the basic literature information obtained at this stage, field studies were carried out in order to create the bases of the design stage. The focal points determined for the landscape design project to be created by photographing during the field studies were determined.

2.3. Usage recommendations and design phase

With the ArcGIS 10.8 application, the Corine data of the current area was examined, mapped at 1/5000 scale and analyzed. The zoning plan of the study area was examined with Autocad programs. The problems identified in the study area as a result of the analyzes were redesigned within the scope of the design idea and their suitability was determined according to these design criteria. He made design suggestions in order to protect and improve the existing cultural value in the study area, to reduce excess carbon emissions in the environment, and to increase the number of green spaces per capita. The project was rendered three-dimensional in SketchUp Pro 2022 program and three-dimensional images were taken from the project with Lumion 12.5 Student V. Necessary final arrangements and presentation formats were made with Photoshop CC program.

3. Results and Discussion

Streams and rivers are important natural resources for cities and citizens. These are the areas where people constantly spend time and do recreational activities. The strengths-weaknesses-opportunities-threats of Sarıçay and its surroundings, which were determined as the study area, were discussed in a comprehensive way. SWOT analysis in which problems and opportunities are identified and the current situation is interpreted; field studies, Sağlık, Erduran and (2012) and Sağlık and Kelkit (2014) studies (Table 1). of the data.

Table 1
SWOT analysis of the study area

SWOT analysis of Sarıçay	
Strengths	• The mobility of the topography • Having their own microclimate areas • Preservation of natural texture among settlement textures • Being close to the places that can be the focus-emphasis point in the urban texture • High potential for recreational activities • Visual richness and dominance of the landscape • Absence of significant environmental pollution • Ease of access for people to the area • Opportunity to participate in different activities in the field
Weaknesses	• Settlements around • Insufficient infrastructure • Increasing construction • Lack of maintenance and poor quality of equipment in the area • Unsafe river environment • Lack of suitable areas and guiding elements for the accessibility of people with disabilities • Environmental wastes originating from humans in the area
Opportunities	• Potential to be a central green area within the urban area • Potential to be an important focal point within the urban area • Creating potentials for viewing terraces in the area • To be resolvable in terms of accessibility • Being a valuable area in terms of increasing urban green infrastructure • Availability of suitable areas for different recreational activities • Potential suitable for river activities
Threats	• Continuation of construction in the area • The risk of loss of the valley landscape and existing green texture due to property status and constructions • Water pollution in the area • Alluvial soil and seismicity

When observations are made with field work in Sarıçay and its surroundings, it is seen that the study area is quite neglected. The existing trees in the study area are given in Table 2. The presence of densely leafy trees was detected in the area (Figure 3).

Table 2
Existing tree and bushes in the study area

Turkish Name	**English Name**	**Botanical Name**
Zeytin Ağacı	Eeuropean Olive Tree	*Olea europaea*
Tesbih Ağacı	Chinaberry Tree	*Melia azedarach*
Doğu Çınarı	Old World Sycamore	*Platanus orientalis*
Kuş İğdesi	Russian Olive	*Elaeagnus angustifolia*
Diş Budak Yapraklı Akçaağaç	Ash-Leaved Maple	*Acer negundo*
Ağaç Hatmi	Syrian Ketmia	*Hibiscus syriacus*
Süs Elması	Japanese Flowering Crabapple	*Malus floribunda*
Şimşir	Common Box	*Buxus sempervirens*
Beyaz Çiçekli Yalancı Akasya	Lack Locust	*Robinia pseudoacacia*
Zakkum	Nerium	*Nerium oleander*
Badem Ağacı	Almond Tree	*Prunus dulcis*
Puro Ağacı	Southern Catalpa	*Catalpa bignonioides*
Salkım Söğüt	Babylon Willow	*Salix babylonica*


Figure 3. Existing plants around Sarıçay

Before proceeding to the design decisions, the Land Use Capability Class (LCS) of the study area was examined with the ArcGIS 10.8 application. In the classifications within the study area boundary, the residential areas are classified as Class I and II. It appears to be class. The opening of the arable areas of Çanakkale city center to settlement shows that there is no correct planning approach. According to the study area boundary, both sides of Sarıçay have Class I land use. In areas where there is a ferry pier square, VIII. It appears to be class. In the middle and narrow parts of the city center, I. II. and III. Classes are available. The land cover classes of Çanakkale city center and Sarıçay region were examined with the CORINE National Land Cover Project obtained from the Coparnicus site, which is open to the public. Agricultural areas, forest and semi-natural areas were determined by the combination of 200 codes and 300 codes of the study area and its surroundings. The historical development processes of agricultural and forest areas, which have been prepared from 1990 to the present and belong to the latest 2018 land cover, have been determined in Figure 4.

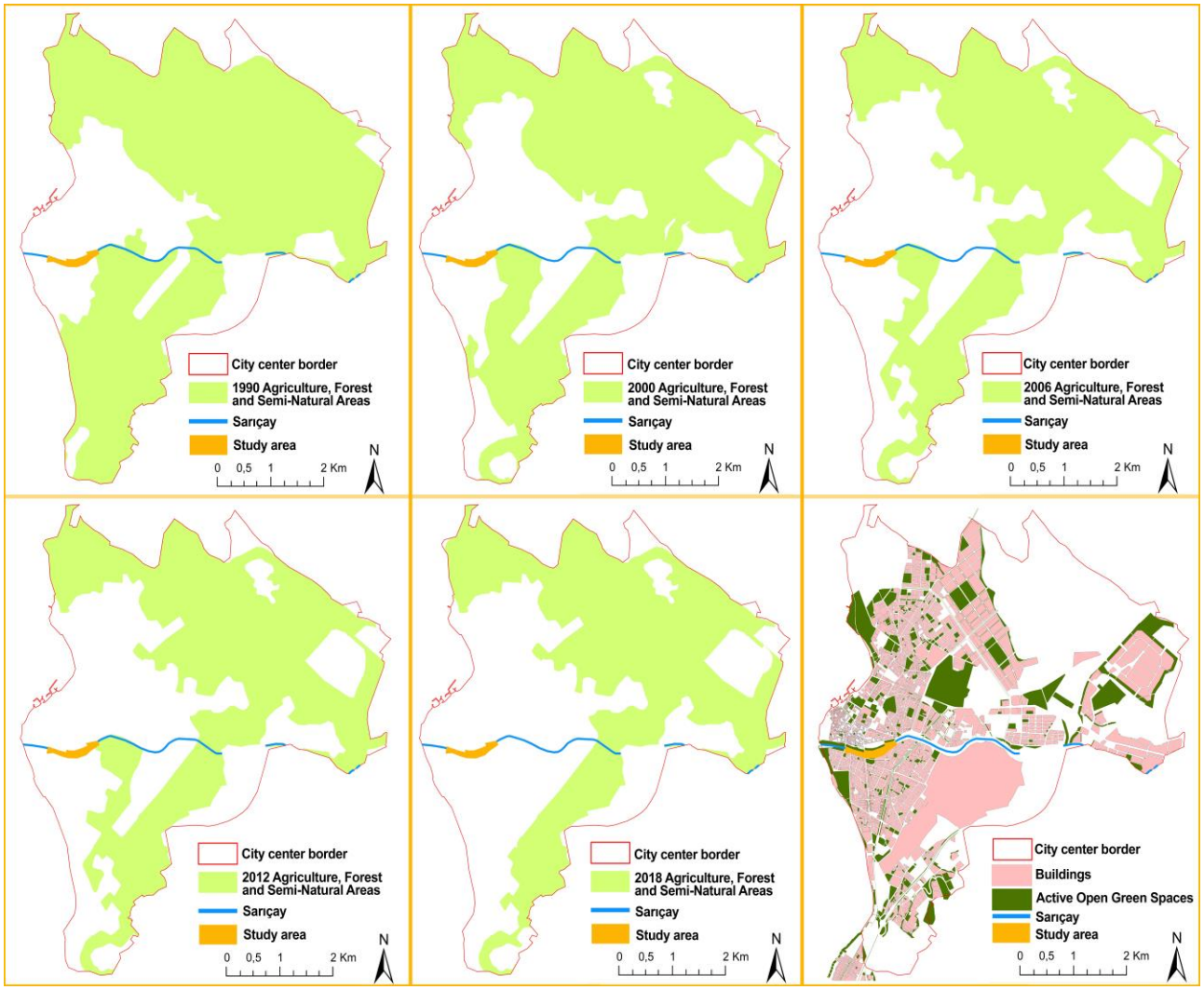

Figure 4. Combination of agriculture, forest and semi-natural areas with CORINE data

Using the Çanakkale zoning plan data, the open green areas of the study area and its surroundings were determined (Figure 5). Today, the rapid increase in population and urbanization causes wrong land use. Changes caused by incorrect land uses have caused serious pressures and various problems on areas with ecological value such as agricultural areas, forest areas, green areas. Sustainable solutions have become important in order to reduce the pressure and problems that occur. Land use suitability analysis, in which various criteria are evaluated, should be considered in order to ensure sustainability (Çelikyay, Cengiz and Görmüş, 2015). Thus, it has been observed that Sarıçay and its surroundings are densely populated and there is not enough green space around the study area.

Figure 5. Çanakkale development plan

Currently, Sarıçay and its surroundings are defined as natural sites. With the examination of the land uses in the zoning plan, primarily the focus-emphasis points were determined within the area and the walking path route was drawn around the area (Figure 6, 7).

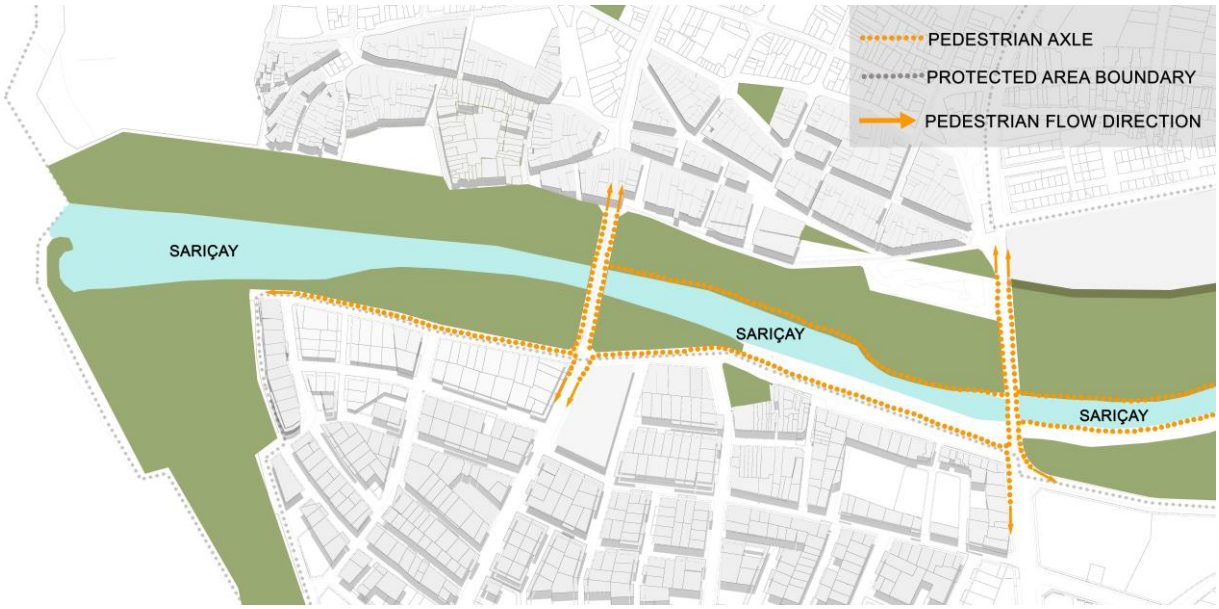

Figure 6. Hiking route

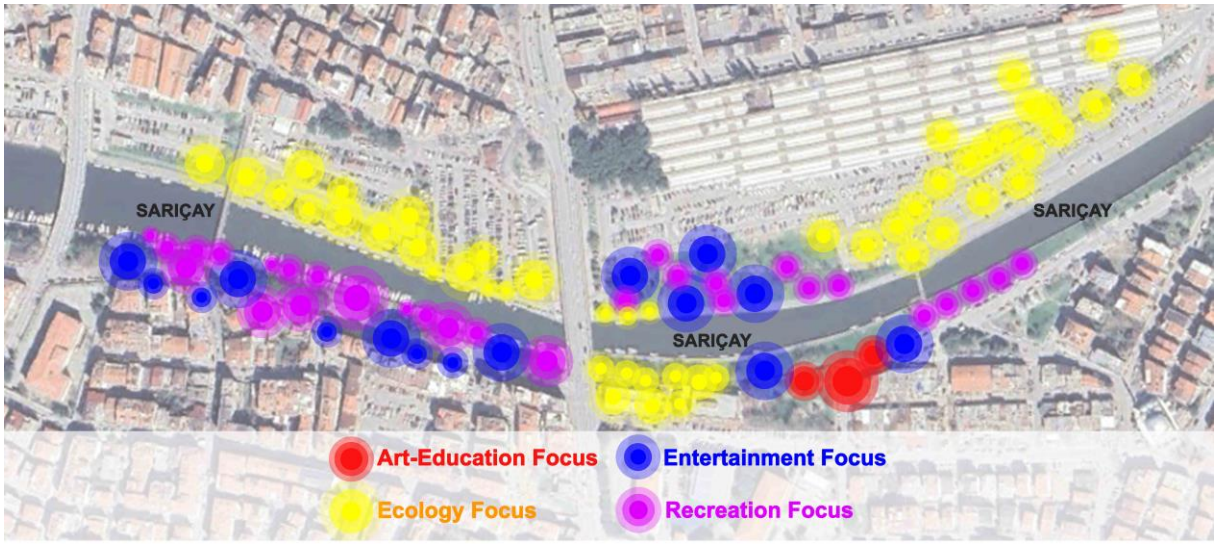

Figure 7. Focal points of the study area

Sarıçay and its surroundings first attract attention with visual pollution (garbage, weeds, etc.) and bad smell. A great ecological threat arises when the garbage thrown into the river meets the sea. These wastes can reach all parts of the world and go under the sea and cause serious damage to the creatures living in the sea (Kayan and Küçük, 2020). For this reason, first of all, warning signs should be placed, garbage traps should be placed at several different points in the river and cleaning work should be started again.

In order to use water effectively in Sarıçay and its surrounding open green areas, it has been suggested to use dense shrubs and shrubs. It will be planned to plant dense shrubs and trees at the corners of the lawn areas and at some edge points, thus increasing biodiversity, reducing carbon emissions and less irrigation of the grass in the existing area. However, several different solution proposals have been identified (Figure 8).

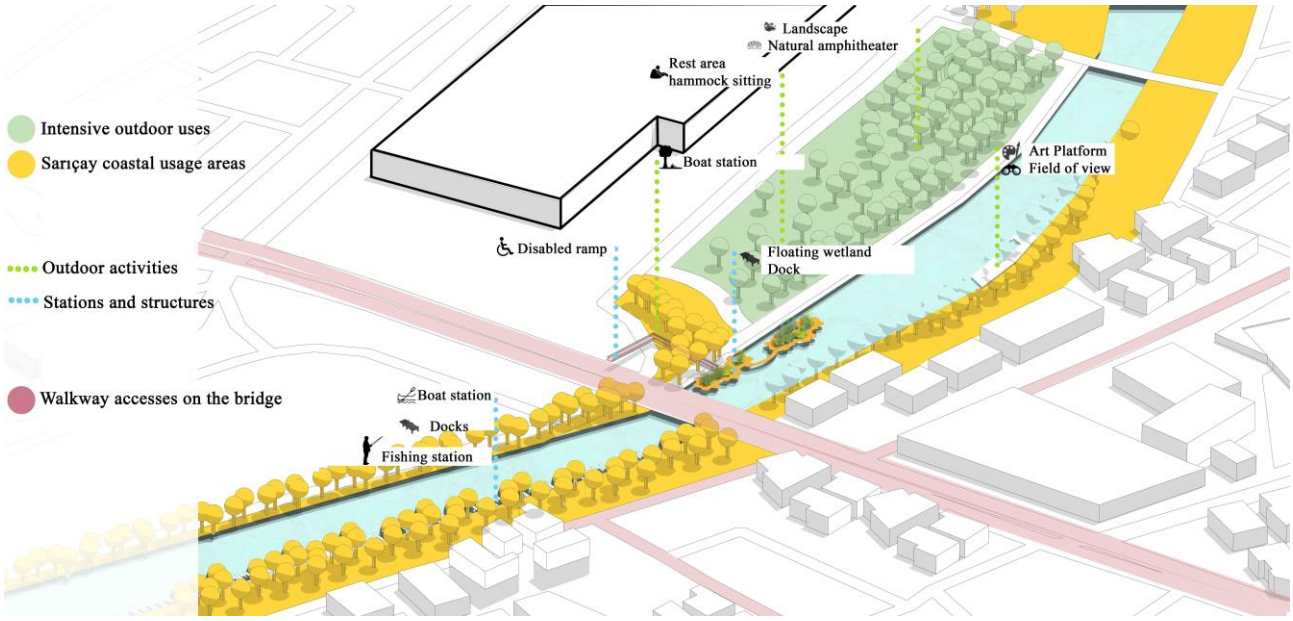

Figure 8. Design suggestions

The fact that the existing water resources (Sarıçay) are not used effectively in the planning of the urban landscape has been a significant loss for the citizens. In the design example, a floating garden pier made of wooden material is considered on the water. This structure has a zig-zag structure in the form of a net. They can navigate in humans as if they were walking on water. The aim here is to enable people to have a different experience and increase the biodiversity of the river (Figure 9).

Figure 9. Current situation and design suggestions

In another design idea, a proposal was made to allow people to travel along the river in canoes or rented boats (Figure 10). Thus, people will be able to use the river and do activities on the water.

Figure 10. Canoes and rental boats along the river

Inadequate and discontinuous walking and bicycle path areas cause people to spend less time around the river. In addition, the dense and dysfunctional hard ground around the river causes an increase in carbon emissions caused by vehicle traffic in the vicinity. The lack of places where people can sit and rest in and around the river is also a major problem. Another design proposal, the art platform (Figure 11), created a wide view area and landscape for people. In this way, they will be able to do their activities together with the calm sound of nature and the river, as they have more control over the area.

Figure 11. Art platform

There are no recreation areas where people can spend time around the study area. Since Sarıçay and its surroundings are in a busy location, this area has become an absolute frequent destination for people. With the design proposal, people are presented with places where they can relax and spend time with each other in the bazaar, around the river after their work is finished. In the shade garden, they will be able to both relax and enjoy nature and the view. In the amphitheater, which was designed by taking advantage of the slope of the area, it was aimed to enable people to socialize with each other and to relieve their daily fatigue by sitting on the grass (Figure 12).

Figure 12. Shade garden and amphitheater

4. Conclusion

Architectural elements have a great importance in forming the urban identity in general. Architectural elements can be examined in two groups as environmental and single building elements. Environmental elements such as the city's topography, natural structure, vegetation, and microclimate constitute the natural

environment of the city (Güler, Şahnagil and Güler, 2016). Streams, which are natural resources, are also included in environmental elements.

Streams are a natural resource for the city and its users. Streams in the city, use of drinking water, irrigation of urban green areas, contributing to transportation, enabling tourism and recreational activities serve various uses. Alkay (1995) explained that river banks provide services for transportation, industry, commercial, settlement, culture and education, recreation purposes (Canik, 2011; Özkaynak and Başar, 2021).

Streams, which are natural resources in urban spaces, provide ecological continuity with their linear feature and are considered as potential areas in terms of recreation. It is known that the aesthetic value of urban rivers is as important as the protection of natural and cultural assets and the identification of the city (Özdede, 2011).

Kürkçüoğlu (2009) argued that the element of water plays an important role in the spatial perception process in urban open space design, that water has symbolic meanings about human life, and that it has refreshing and acoustic properties. In this context, the use of water elements in urban open spaces directly affects the quality and livability of the space.

In the study conducted for this purpose, the changes in the agricultural, forest and semi-natural areas over the years were observed, especially the land cover changes of the city in the years 1990, 2000, 2006, 2012,02018. It has been observed that there is not enough green space around the study area with increasing construction in and around Sarıçay. Sustainable and ecological design proposals were developed by comprehensively addressing the strengths-weaknesses-opportunities-threats of Sarıçay and its surroundings. Vegetative design suggestions were made for the effective use of water in Sarıçay and its surrounding open green areas. In order to ensure that the lawn in the existing area is less watered, designs that use field-specific trees and shrubs intensively have been adopted. Thus, it is aimed to increase biodiversity and reduce carbon emissions. In order to increase the biodiversity in the river, the pier made of wooden material was designed with the logic of a floating garden. The natural grass amphitheater and the shade gardens around it, created by using the natural topography of the area, offered semi-natural living spaces to people. Thus, it will contribute to the increase in the quality of life of the people living in the region by providing different recreational activities for people in the working area.

It aims to protect the urban ecosystem and contribute to the urban green infrastructure with the ecological and recreational landscape design project carried out in Sarıçay and its surroundings, located in the city center of Çanakkale. Making decisions in accordance with the natural topography of the rivers in the cities and establishing their connection with the urban green infrastructure is very important for urban planning and design studies. With its location in the city and its proximity to the city center, the rearrangement of the study area for recreational purposes will provide a better quality space and increase the use of the area.

Author Contributions

Merve Temiz Topsakal: Edited the data, analyzed it, wrote the article and got final approval of the submitted version.

Alper Sağlık: Provided the concept of the study, the draft of the article and final approval of the submitted version.

Zekeriye Gök: Collected the data, analyzed it and wrote the article.

Conflicts of Interest

The authors declare no conflict of interest.

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