

## Rural Development Oriented Ecotourism Planning on Catchment Basin Scale: The Case of Pabuçdere and Kazandere Catchment Basins

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### ABSTRACT

This study was based on the hypothesis that “Ecotourism is an important instrument in sustainable rural development and ecologically-based landscape planning approaches which take the objectives of socio-economic development and nature conservation have an effective role in this issue”. For this purpose, the necessity of ecologically-based landscape planning approaches in the planning and implementation of ecotourism activities and the importance of the views of related stakeholders in decision-making process have been established in this study. The field of study was grounded on subbasin and micro basin boundaries which take natural thresholds into consideration instead of administrative boundaries which contrast with natural thresholds. A total of 31 micro basins, consisting of 20 basins in the Kazandere basin of a total of 293 km<sup>2</sup> in the northwest of Turkey and 11 basin in the Pabuçdere basin, have been assessed. A 3-phased method was followed in the study. Firstly, the inventory and data base of the field were created on Geographic Information Systems medium and micro basins were determined. In the second phase, suitability analyses were carried out on the basis of the Ecotourism Opportunity Spectrum (ECOS) according to 6 basic components, 15 assessment factors, and 24 sub-criteria. In the third phase, the micro basins suitable for ecotourism potential were determined by creating a synthesis sheet on the field of study as a result of related analyses and assessments, and ecotourism oriented development strategies were developed by utilizing the rapid rural appraisal conducted in the area and visitor questionnaires as well.

**Keywords:** Agricultural marketing, Geographic Information Systems, Landscape planning, Rural planning.

### INTRODUCTION

Rural landscapes are the transition areas between the urban areas, where intense human effect exists, and the natural areas, where there is no direct human effect. When compared with urban settlements, they have local distinguishing qualities with natural, gastronomic and folkloric identity values (Aytüre, 2013).

There are three main components in the world and in Turkey for local/rural

development. These are historical and cultural heritage, natural resources (geographic thresholds), and local capabilities. Administrations who are able to combine these three components stand out as creating difference in the countries they are located in (Akman *et al.*, 2013). One of the most important activities which combines these three components and can be implemented in rural areas is ecotourism. Ecotourism is a type of tourism which ensures the conservation of natural areas (Blamey, 2001), contributes to

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the protection of species and habitats (Goodwin, 1996), includes the individual activities people carry out to discover and learn cultural values and attach importance to them (Blamey, 1997), necessitates the cooperation of officials, tourism industry, tourists and local community (Björk, 2007) and supports issues such as the protection of the environment, social equality and environmental education to maintain economic vitality without harming the environment (Powell and Ham, 2008).

Ecotourism is based on the natural environment with a focus on natural and cultural heritage (Li, 2004). Drumm and Moore (2005) contend that ecotourism is one of the alternative economic activities and a viable strategy to simultaneously make money and conserve resources. Therefore, ecotourism is accepted as an alternative type of sustainable development (Godratollah *et al.*, 2011). In this context, ecotourism is one of the important steps of progress and development on the basis of the development of rural areas which stand out with their different local and natural identities and sustainability of natural resources (Bhuiyan *et al.*, 2012).

There are different methods and approaches for the determination of ecotourism potential (Lindberg and Hawkins, 1993; Beeton, 2001; Weaver and Lawton, 2007; Krüger 2005). The concept of "Ecotourism Opportunity Spectrum (ECOS) method" (Boyd and Butler, 1996), which has been created by the combination and adaptation of Recreation Opportunities Spectrum (ROS) (Clark and Stankey, 1979; Buist and Hoots, 1982; Boyd and Butler, 1996) and Tourism Opportunities Spectrum (TOS) (Butler and Waldbrook, 1991; McCool and Moisey, 2001) approaches, has been utilized in this study. In addition, the ECOS method has been supported by Rapid Rural Appraisal Technique and questionnaire activities. The aim of the ECOS method is to assist in the determination of ecotourism resource values in the framework of general

planning principles (Boyd and Butler, 1996; Kiper, 2013; Neth, 2008).

Rapid Rural Appraisal is a technique which involves the collection of data through field surveys and participative activities (Cavestro, 2003; Beebe, 1995; Gülçubuk, 2000; Kiper *et al.*, 2011; Cengiz and Çelem, 2005).

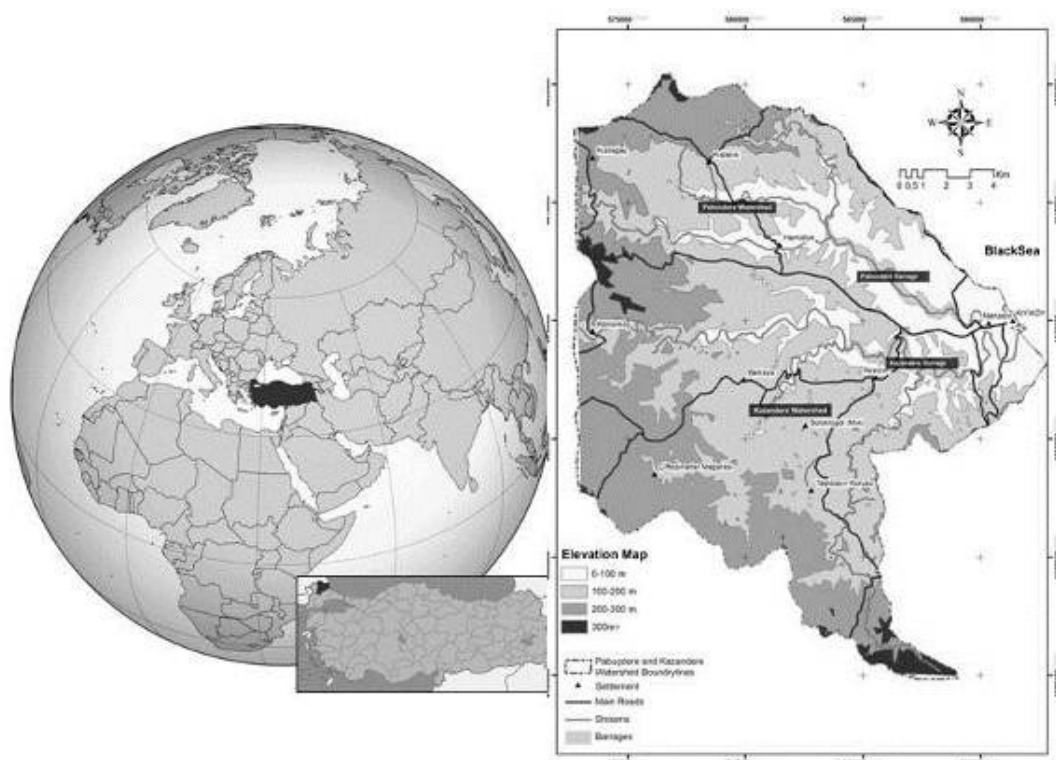
From this general perspective, the will be carried out.

The aim of this study was to develop ecotourism oriented development strategies for Pabuçdere and Kazandere Catchment Basins by utilizing the rapid rural appraisal conducted in the area and visitor questionnaires.

## MATERIALS AND METHODS

Pabuçdere and Kazandere basins of 293 km<sup>2</sup> area located in the northwest of Turkey constitute the main material of the study (Figure 1).

There are a total of 6 villages and 1 town within the Pabuçdere and Kazandere basins. Due to both its geographical position and natural resources, the area has had a rich history with the Hellenic, Roman, Byzantine and Ottoman civilizations who developed on the Thrace civilization over time (Thrace Uniting Force: Nature, Water, Culture, Strategy Plan, 2012). In the assessment of the main and sub criteria of the study region, maps of 1/25,000 scale topography, soil, geology, and forest management, as well as climate data have been utilized. Population data obtained from the Turkish Statistical Institute, agriculture and livestock data obtained from the Ministry of Food, Agriculture and Livestock, Rapid Rural Appraisal such as (sample respondents are consisting of the local residents, local and central authorities, tour operators and civil society organizations, etc.) and visitor questionnaires with field observations have been used in the data on cultural landscape.

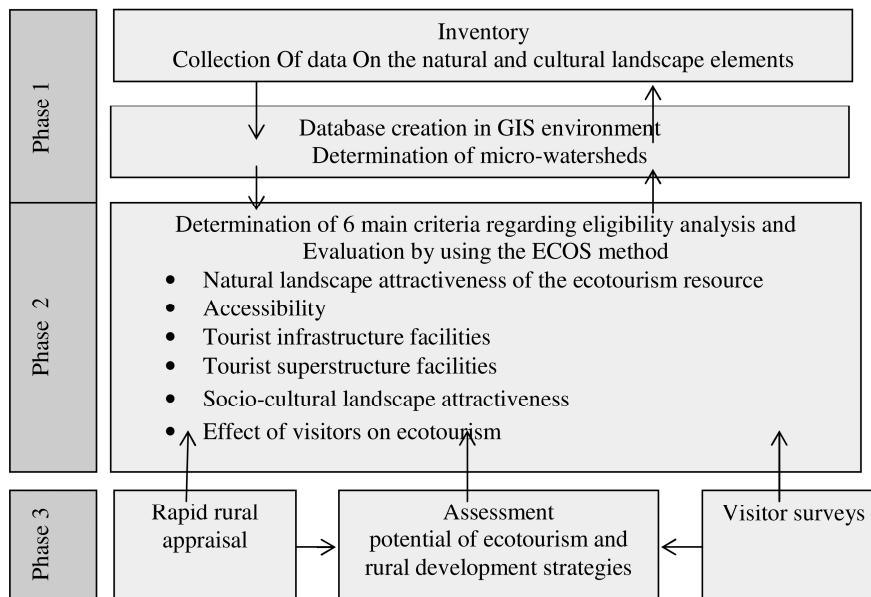


**Figure 1.** Pabuçdere and Kazandere Basins.

The assessment of all data has been conducted on the basin scale, which is considered important on national and international levels in ecologically-based plans and in the management of natural resources in recent years (Jones *et al.*, 1997; Farrington *et al.*, 1999; De Azevedo *et al.*, 2000; Efe and Sılaydın Aydın, 2009; Garipoğlu, 2012; National Watershed Management Strategy (2014-2023), 2014; Anonymous, 1997), according to the micro basins determined in the Pabuçdere and Kazandere subbasins. (1) The usage of subbasin and micro basin boundaries, which consider natural thresholds and more easily reflect the ecological dimension of rural development, in the determination of ecotourism potential instead of administrative boundaries; (2) Formation of a base for future planning studies by digitizing the quantitative and qualitative data of the field of study on CBS medium; (3) Determination of the area's natural and cultural texture which will create resources for ecotourism through field trips;

(4) Observation of values, distinctions and shortcomings on-site and detection of local differences; (5) Carrying out of suitability analyses with the ECOS method on micro basin scale, and (6) Development of some suggestions and strategies on micro basins with high ecotourism potential by using rapid rural appraisal and visitor questionnaires as well. A 3-phased method has been followed in the study (Figure 2).

In the first phase of the research, the data on the natural landscape elements and on the cultural landscape elements of the area were collected and were digitalized on CBS (Arc GIS 10.00) medium. The boundaries of the micro basins in the Pabuçdere and Kazandere basins were drawn by using the contour lines in the topographic and hydrological maps and they were cross checked via the ArcHydro module of the ArcMap 10 software. According to this process, study area was divided into a total of 31 micro basins as 20 in Kazandere basin and 11 in Pabuçdere basin. The basin code



**Figure 2.** Flowchart of the study method.

values in the study area are presented in Figure 3-a.

In the second phase, the ECOS, which is one of the methods providing the determination of ecotourism potential, was utilized by developing it with the suitability analysis of Boyd and Butler (1996) (Gulinck *et al.* 2001; Khalid *et al.*, 2010 a, b; Jurowski, 2010; Yaseera and Sharma, 2014; Uzun *et al.*, 2010; Açiksöz *et al.*, 2010). As stated in Table 1, 6 main components, 15 assessment factors, and 24 subcriteria as natural landscape attractions of the ecotourism source, accessibility, touristic infrastructure opportunities, touristic superstructure opportunities, socio-cultural landscape attractions and the effect and viewpoint of visitors on the ecotourism resource have been identified. In the determination of the assessment factors and sub-units, the aim of the study, characteristics of the area, expert opinions and status of the user group have been guiding. Each assessment factor was scored from 1 to 4 according to its degree of importance (1= Least suitable; 2= Averagely suitable; 3= Suitable, 4= Very suitable evaluation factor allows for high-level ecotourism activity). The scores given in Table 1 were applied to the micro basins related to the Pabuçdere and Kazandere subbasins. Scores were given in

terms of availability or areal features depending on the type of the assessment factor. For instance, in the adaptation of the availability criteria to the micro basin, the fact that the related criteria is available in the micro basin enabled the writing of the related score to the database of that micro basin.

In the third phase, 24 different maps related to each criterion were created and synthesized in 6 different maps by combining them according to basic evaluation criteria and suitability analysis formed in the framework of the ECOS method (Mc Harg, 1969). Rapid rural appraisal conducted in the study area (which was realized with a group of 65 consisting of district governorship, local administrations, village headmen representing the local community, governmental agencies and the University), visitor questionnaires (120 people) and field observations were utilized in the assessment and scoring of the related criteria. The total scores of each micro basin on their suitability for ecotourism were calculated in terms of 24 criteria by creating a synthesis sheet related to the research area as a result of the related analyses and assessments and adding up the scores of each micro basin. When micro basins of four point scale for the identified 24 identified criteria in terms of

**Table 1.** The criteria used in the evaluation of ecotourism resources according to ECOS and Suitability Analysis methods.

Natural landscape attractiveness of ecotourism resources		score	
	Temperature (°C) (Average annual temperature)	15- 25 25-36, 4-15 4< 36>	4 2 1
1. Climate	Precipitation (mm) (Average annual precipitation)	500-1250 250-500, 1250-1500 0-250, 1500>	4 2 1
	Wind Speed (m sn <sup>-1</sup> )	0-10	4
	Humidity (%)	30-65	4
2. Soil	Drainage	No drainage problem Drainage problem	4 1
	Erosion	None or slight Moderate Severe	4 2 1
	Land use capability classes	VI, VII, VIII Class IV Class III Class	4 3 2
3. Topographic structure	Elevation groups (m)	I ve II Class	1
	Slope (%)	0-300 %0-20 %20>	4 4 3
4. Natural plant asset		Availability	4
5. The presence of wild animals		Availability	4
6. Geological-geomorphological structure		Availability	4
	Accessibility		
7. Access to ecotourism resources	Access to water resources/Access to shore (m)	0-1000 1000-5000 5000<	4 3 2
	Access to water resources / Access to streams and dams (m)	Micro-watersheds where there are streams and dams Micro-watersheds where Papuçdere and Kazandere streams flows through Micro-watersheds adjacent to the micro-watersheds where rivers are available Other micro-watersheds	4 3 2 1
	Access to road	Micro-watersheds where the main road passes through Micro-Watersheds adjacent to the main road Other micro-watersheds	4 3 2
	Access to residential areas	Micro-watersheds located within the settlement Micro-watersheds adjacent to Micro-watersheds which are located within the settlement Other micro-watersheds	4 3 2
Tourist infrastructure facilities			
8. Access to potable water, electricity and media facilities		Micro-watersheds where the infrastructure facilities are available (m)	4
	Tourist superstructure facilities		
9. Accommodation facilities		Availability	4
10. Food and beverage facilities		Availability	4
11. Health units		Availability	4
	Socio-cultural landscape attractiveness		
12. Tourism perspective of local people		Positive	4
13. Traditional settlement pattern		Availability	4
14. Traditional social activities		Availability	4
	Effect of visitors on ecotourism		
15. Knowledge and expectations of visitors related to the field		Positive	4



ecotourism opportunity, the scores varied between 59 and 91. The difference between maximum and minimum scores were then divided into 4 equal parts on the basis of the quaternary scale and ranking was made according to value intervals (highly suitable (83-91), suitable (75-82), moderate fit (67-74), less suitable (59-66) for ecotourism) (Akpınar, 1994; Uzun *et al.*, 2010). The ecotourism potential of the whole area was established according to value intervals. Ecotourism oriented rural development strategies which take ecologically-based landscape planning approach as a basis were developed in conclusion.

## RESULTS

Suitability analysis activities were carried out on micro basin level in the framework of the ECOS method (Table 1). Firstly, analyses were conducted in GIS medium according to sub assessment criteria and maps were prepared. Maps were then created in GIS medium according to the basic assessment criteria (Figures 3, a-d and Figure 4, a-b). This approach provides conveniences both in terms of the rural development oriented ecotourism plan's correspondence with the ecological boundaries and in the application and control phase of a plan's decisions, which enables the integrated assessment of basins. In the scope of natural landscape attractions of the ecotourism resource which is one of the basic factors selected in the framework of the ECOS method, climate, soil presence, topographic structure, natural vegetation, wildlife existence, geologic-geomorphologic structures were assessed and were transferred to maps upon their inquiry on the GIS medium (Figure 3-a).

Under the fundamental factor of accessibility, access to water resource, access to road and access to a settlement center were interpreted and mapped (Figure 3-b). Under the touristic infrastructure opportunities assessment factor, drinking water, electricity, and access to means of

communication (obtained through the interviews) were evaluated. Accordingly, micro basins with touristic infrastructure opportunities scored 4 points (Figure 3-c). Touristic superstructure opportunities were also determined through the interviews and field observations. Micro basins with accommodation opportunities, food and beverage facilities and health units scored 4 points (Figure 3-d). Under the socio cultural landscape attractions assessment factor, viewpoint of the local community on tourism (obtained through the interviews), traditional settlement texture, traditional social activities were included. Micro basins with these factors scored 4 points in the study (Figure 4-a). With regard to the effect of visitors on ecotourism factor, knowledge level and expectations of the visitors from the area were dealt with. The most suitable areas for ecotourism from the visitors' perspective were determined and mapped as a result of the interviews conducted with the visitors (Figure 4-b).

Factors annotated in 6 different maps upon the combination of the suitability analyses were synthesized in a single map (Figure 5). Micro basins with rural settlements were found to be "very suitable" and "suitable" for ecotourism. In terms of ecotourism, no averagely suitable micro basin was encountered in the study.

## CONCLUSIONS

Many places in Turkey can be considered as ecotourism areas, if they have ecological potential. However, Pabuçdere and Kazandere Catchment Basins have different characteristics than the others. Some of these characteristics are given below:

- Recommendation of the area as ecotourism city in the Turkey Tourism Strategy (2023) action plan.
- Located within the buffer zone of very important areas such as İğneada Longoz

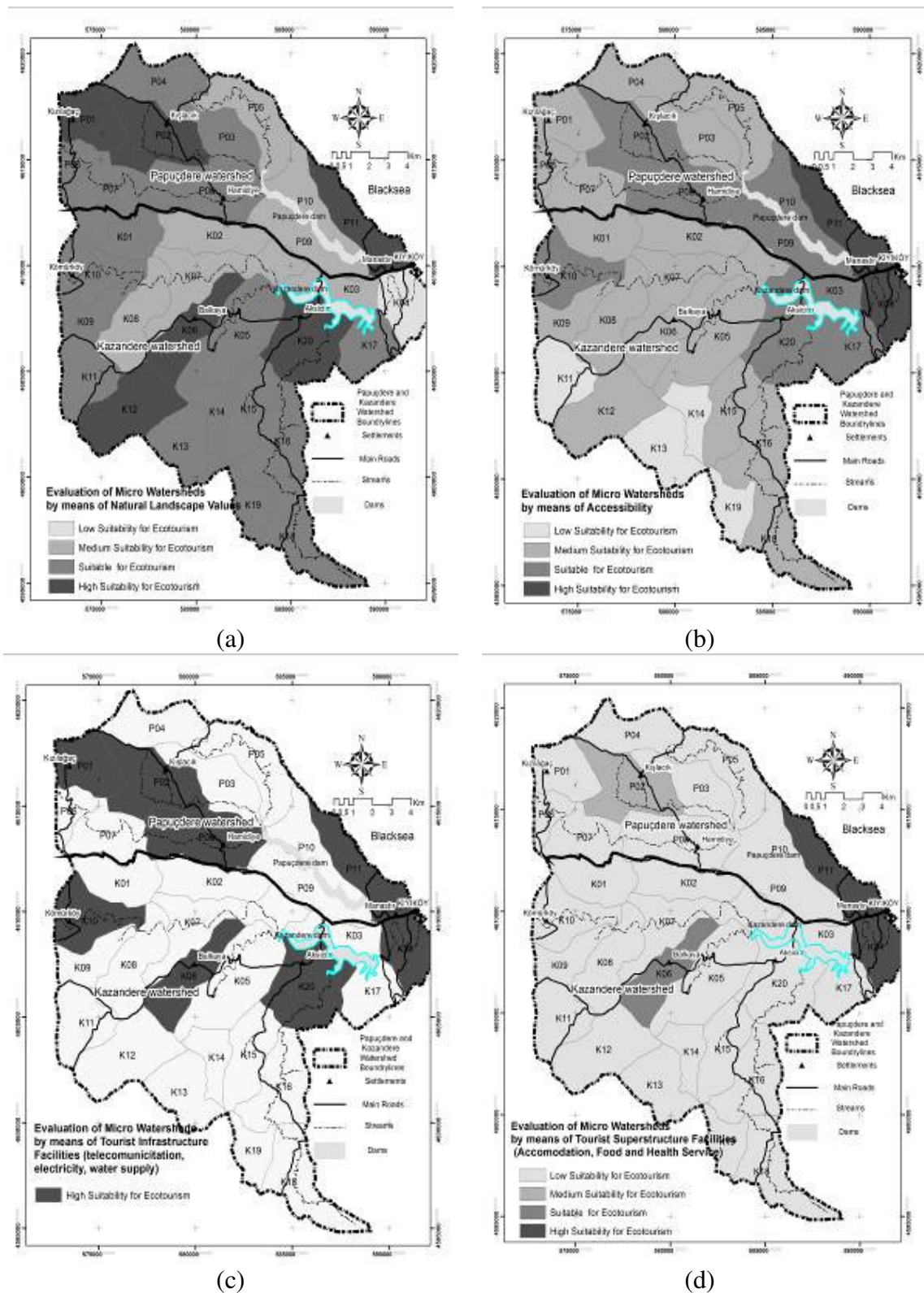


Figure 3. Suitability of micro-watersheds in terms of (a) natural landscape attractiveness, (b) accessibility, (c) tourist infrastructure, (d) tourist superstructure.

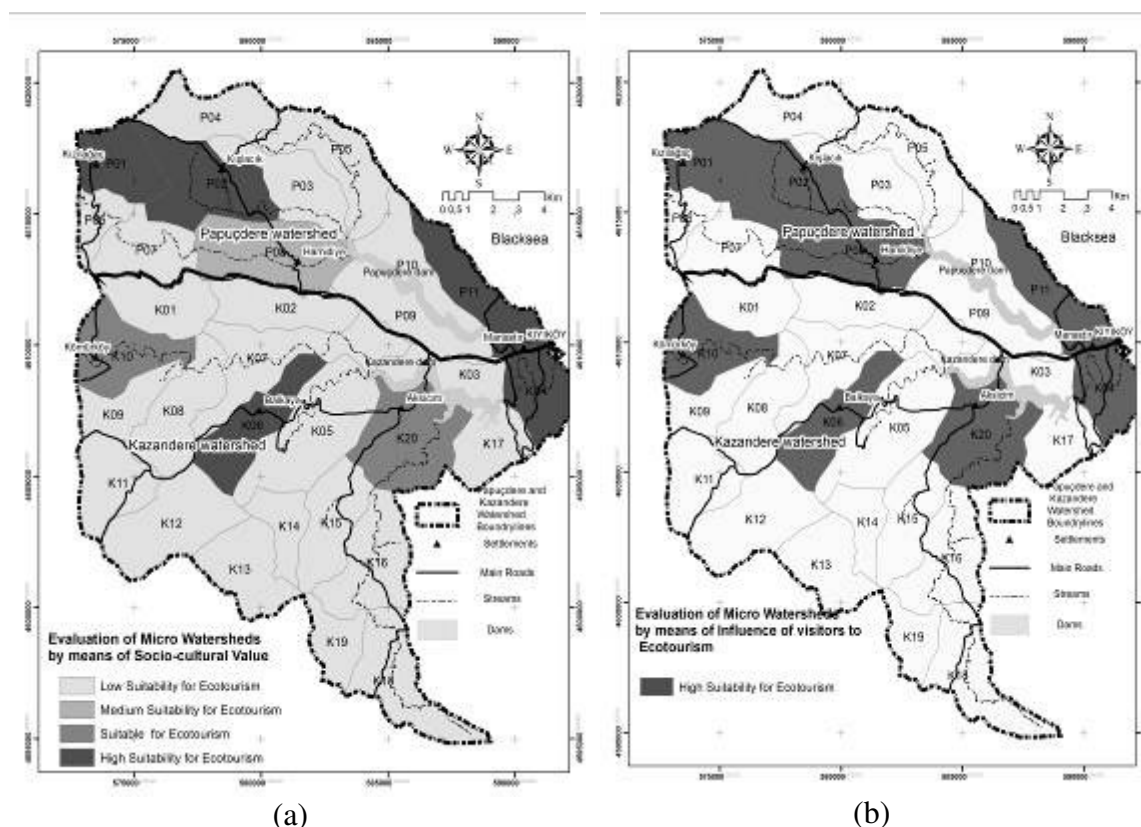


Figure 4. Suitability of micro-watersheds in terms of (a) socio-cultural landscape attractiveness, (b) the effect of visitors on ecotourism.

Forest Natural Park, Kasatura Bay Nature Preserve, Yıldız Mountains.

- Situated in a part of area in the context of Yıldız Mountains Biosphere project.
- The presence of historic traces (historical wine route, Sultans route).
- Located in major bird migration routes.
- Presence of many caves (Kıyıköy, Kovantaşı, Yenesu, etc.).
- Various folkloric values (Bosnian culture, socio-economic structure.) and its traditional products (mushroom, honey, linden, Bosnian pastry, buffalo yoghurt, etc.).

Even though 8 basic criteria are used in the determination of ecotourism resources in the ECOS method (Boyd and Butler, 1996), 6 basic criteria were taken into consideration of Açıksöz *et al.* (2010) and Türker's (2013) studies. In this study, 6 main components, 15 assessment factors, and 24 subcriteria were identified. This indicates that the

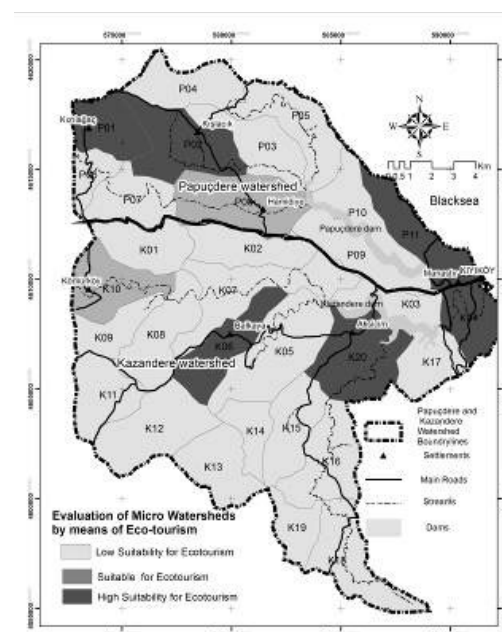


Figure 9. Ecotourism Suitability of micro-watersheds.



ECOS method can be adjusted according to different geographies.

As a result of the suitability analyses conducted in the framework of the method, micro basins with the following characteristics have been determined as the most suitable areas for ecotourism:

- The stated climate conditions are preserved.
- Have no drainage problems and erosion is non-existent or observed mildly.
- Have land classess in the 4th, 7th and 8th class.
- The altitude is 0-300 m and the slope can rise from 0 to 20%.
- Are rich in terms of water resources and where water resources have very intense effects.
- Have no accessibility problems.
- Are close to rural settlements and have touristic infra and superstructure opportunities.

In the assessments made in the studied basins, areas with unsuitable ecotourism opportunity have also been encountered. The reasons behind this include intensive immigration due to economic causes and the steady decline in young population, the insufficiency in the infra and super structure services which involve the basic requirements for visitors such as accommodation and food and beverage. However, considering the measures taken against the limiting factors, it is observed that the determination and development of areas which are suitable for ecotourism are possible in the micro basins which are considered unsuitable for ecotourism opportunities. In this context, various rural development oriented strategies must be developed. Within this framework, strategies which are based on seven main axis must be developed. These include "Creating an Ecotourism Image, Creating Thematic Development Regions and Corridors, Assessment of Non-Wood Forestry Products with Economic Values in the scope of Agro-Eco Tourism, Organization of Traditional Production Methods according to the Needs of Ecotourism and Provision of Their

Integration to Ecotourism, Raising Awareness on Ecotourism and its Inclusion among the Ecotourism Activities of the Local Community, and the Improvement of the Cooperation Level and Organization Opportunities on Ecotourism among Stakeholders" (Turkey's Tourism Strategy 2023 Action Plan, 2007; Cengiz, Tüfekçioğlu and İskender, 2005; Kiper and Cengiz, 2011). Thus, both a strong tourism route and destination will be created in the area and the strengthening of settlements located in the area will be ensured.

Different from the methods of similar studies, an ecological-based approach at the level of micro-basins has been taken, which has provided the correspondence of economic activities with ecological boundaries.

In conclusion, realization of methods such as ECOS, etc. with an ecologically-based planning approach and micro basin level participative assessments will ensure the followings:

- Determination of ecotourism potential according to natural and cultural landscape elements and on the basis of a scientific method.
- Compiling basic data for the design of WEB pages in which regional products are promoted.
- Wise use of natural resources by creating landscape management guides in micro basins suitable for ecotourism, the limitation of ecotourism activities in units where landscape is sensitive.
- Carrying out of ethnobotanic studies devoted to the use of plants with different purposes such as nourishment, feed, medication, handicrafts by utilizing the knowledge of the local community and experts in the area; and investigating the ways and the level of use of the plants by villagers, and thereby increasing the income level of the community by virtue of rural development oriented projects.
- Conscious ecotourism planning and management of the study area with decisions such as the market analysis of



the products will constitute a scientific basis for all these decisions.

- Consequently, some strategies and suggestions regarding ecotourism development are provided for the study area. These strategies and their purposes are given below (Kiper et al., 2015):
- **Building an ecotourism image** to launch promotion and marketing activities on thematic destinations in order to ensure the recognizability of the area at the regional, national, and international level and thereby creating a trademark for the area in question.
- **Creating thematic development areas for ecotourism** to ensure that the development of ecotourism is maintained throughout the year by creating thematic development areas.
- **Ecological areas focused on plant watching** to evaluate the economically viable non-wood forest products (medicinal and aromatic herbs, mushrooms etc.) in terms of their ecotourism value.
- **Creating ecotourism development corridors** to ensure that the development of ecotourism is maintained in a holistic manner based on thematic axes, rather than on a point scale, and prioritize the natural, cultural, and historical values of the area and utilize ecotourism as a potent tool for regional development.
- **Getting local population preferentially involved in the ecotourism activities** to ensure the sustainability of ecotourism in terms of its planning, development, implementation and follow-up stages.
- **Improving the level of cooperation and organization among the partners for ecotourism** to ensure the sustainability of ecotourism in terms of its planning, development, implementation, and follow-up stages.

In conclusion, the application of ecologically-based landscape planning approaches is necessary in the planning and implementation of ecotourism activities and the opinions of the stakeholders must be received in the decision-making processes as

well. Because a sustainable ecotourism is one of the pioneer sectors of development and, as Karaman (2004) states, it is a type of tourism which has the possibility of being materialized with an environmentalist management and planning due to its environmentally and ecologically sustainable, economically feasible, and socially acceptable qualities. However, ecotourism may have negative effects when it is not planned and managed properly, despite having eco-friendly objectives. It is essential to have correct planning, coordination, organization and education to prevent this. The aim is to provide the local community with long-term and sustainable income instead of yielding short-term advantages and attracting fewer, but more conscious visitors to the field throughout the year.

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## برنامه ریزی اکوتوریسم در مقیاس حوضه آبریز برای توسعه مناطق روستایی : مطالعه موردی در حوضه های Kazandere و Pabuçdere

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### چکیده

پژوهش حاضر بر مبنای این فرضیه راه اندازی شد که اکوتوریسم ابزار مهمی در توسعه پایدار مناطق روستایی است و برنامه ریزی سرزمین مبتنی بر زیست بوم شناسی که اهدافش توسعه اجتماعی-اقتصادی و حفظ طبیعت باشد نقش موثری در این زمینه دارد. به این منظور، در این پژوهش ضرورت کار برد روش های برنامه ریزی سرزمین مبتنی بر زیست بوم شناسی در برنامه ریزی و اجرای فعالیت های اکوتوریسم اقتصادی و اهمیت نظرات ذیمدخلان (ذینفعان) مربوطه در فرایند تصمیم گیری مورد تاکید قرار گرفته است. مطالعه صحرایی با توجه به مرزهای زیر-حوضه ها و حوضه های کوچک که در گاه های طبیعی را به جای مرز بندی سیاسی-اداری لحاظ می کنند انجام شد. در مجموع، ۳۱ حوضه کوچک شامل ۲۰ مورد در حوضه Kazandere به مساحت ۲۹۳ کیلومتر مربع در شمال غربی ترکیه و ۱۱ مورد در Pabuçdere ارزیابی شد. این مطالعه در سه مرحله انجام شد. نخست، موجودی ها و داده های مزارع در محیط سامانه اطلاعات جغرافیایی ثبت شد و حوضه های کوچک مشخص گردید. در مرحله دوم، تحلیل های تناسب منطقه ای (suitability analyses) بر مبنای طیف فرصت های اکوتوریسم (ECOS) با در نظر گرفتن ۶ جزء اصلی، ۱۵ عامل ارزیابی، و ۲۴ ضابطه انجام شد. در مرحله سوم، بر مبنای تحلیل ها و ارزیابی های انجام شده، لایه ای حاوی کلیه اطلاعات منطقه مورد مطالعه تهیه گردید و حوضه های کوچکی که مناسب اکوتوریسم بود تعیین شد. سپس، با استفاده از روش ارزیابی سریع روستایی (rapid rural appraisal) که در منطقه اجرا شد همراه با پرسشنامه حضوری، راهبردهای توسعه بر مبنای اکوتوریسم تهیه شد.