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### EXAMINATION OF AGRO-TOURISM POTENTIAL: BURSA PLAIN

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#### Abstract

Agro-tourism, which is a product of tourism depending on agricultural environment, agricultural products and accommodation in agricultural areas, becomes more and more important tourism activity in all over the world. Environmental awareness within the scope of agrotourism paves the way for the protection of natural resources. Also, providence of sustainability increased the significance of this tourism. This study attempts to determine agrotourism potential of Bursa Plain evaluating various agricultural features. Accordingly, thematic maps are created with the Geography Information System (GIS) techniques. In the study, it has been identified to 85,33% of The Plain was formed from the most appropriate and appropriate areas for agro tourism potential. Afterwards, consistency of field work and SWOT analysis was measured. As a result of this study, it has been determined that there are appropriate places in Bursa Plain suitable for agro-tourism and the agricultural fields with agro-tourism potential have been dealt with. Number of recommendations was made to value the potential.

Keywords: Bursa Plain, Agro-tourism, GIS, SWOT.

#### 1. Introduction

Recently, visitors who prefer mass tourism have turned their faces away from the products of classical tourism to the alternative products of tourism. It is remarkable that especially domestic and foreign tourists prefer areas away from noise and pollution, rural areas with preserved nature. The decline of natural and cultural sources, the emergence of the understanding of sustainable tourism, the adoption of the understanding of the expansion of tourism thoughout a whole year, the boredom of visitors from mass tourism (sea- sand- sun), the creation of various pleasure, excitement and vacations for consumers, different expectations of people from holiday and tourism have led to an increase of alternative tourism types (Bruwer, 2003: 423). One of these is rural tourism. Feeling better by being in touch with nature and the interest of living in rural areas make people head toward rural tourism. It is also possible to say that various activities and festivals held in rural areas and particulary the interest in natural agricultural products make people head toward rural tourism (Albayrak, 2013:132). Agro-tourism which emerged as a sub-branch of alternative tourism is one of the types of alternative tourism. Agro-tourism and farm-based tourism are the types of tourism which are basically similar to each other. Therefore, it is difficult to differentiate one from the other entirely. These tourism activities, described with similar definitions in literature, involve little differences. What is important in agro-tourism is the agricultural product. Visitors want to be especially in the growing, caring or harvesting process of a crop. Accomodation place is of secondary importance in agro-tourism. People can also participate in agricultural activities while putting up at a luxury hotel. What is important in farm-based tourism is to make a participant live completely like a farmer. The main reason for travel in farmbased tourism is farm life. Visitors must stay on a farm. Moreover, visitors must be made feel like farmers by getting involved in the rearing of farm animals, the growing process of agricultural products and daily farm chores (Uygur and Akdu, 2009:156). Unlike farm-based tourism, activities like tasting homemade products such as canned foods, pastry, cheese, buying farm products, participating in daily farm activities, observing local culture and traditions (dance, music, clothing etc.) can be done in agro-tourism (Gündüz, 2004:40).

Considering the etymological origin of the concept agro-tourism, it consists of the combination of the words agriculture and tourism. The prefix agri derived from Latin word ager which means field (cropland). The concept agro in Greek is used in the sense of soil and agricultural science (Civelek etc., 2014:16). If economic activity in any rural settlement is agriculture and tourist applications involve mainly agriculture-based programs, this type of tourism is called agro-tourism. While agro-tourism is an activity, at the same time it helps preserve natural environment and its traditional rural geographical appearance, builds the relationship between environment, agriculture and tourism (Erdoğan, 2003:130). Agro-tourism is exercised in regions where agricultural production is intense. With this characteristic, agro-tourism instead of replacing tourism. It is a new field of tourism activity not destroying agricultural land, which is frequent especially in developing regions, on the contrary also developing tourism along with agriculture (Küçükaltan, 2002: 151).

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There are some characteristics of the concept agro-tourism. The first one is participating in an agricultural activity conducted in an agriculture-based farm. Secondly, tourists must be involved in tourism activities directly (milking, harvesting etc.), indirectly (preparing and selling food products etc.) or passively (activities done outside farms). Third characteristic is that tourists must have the sense of authenticity in their agriculture based experiences (Philip et all., 2010). The production and export of local products is important for countries with agricultural economies. Especially in countries like Italy, Spain and Greece, agro-tourism is used as an important means of regional development. In olive oil production related tours made in Andalucia region of Spain, one of the leading olive oil producers in the world; activities like tasting olive oil, watching oil harvesting, visiting olive producing companies accompanied by local olive oil experts are appealing to tourists. According to the study conducted by Kosmaczewska in 2008, there are 450 agro-tourism farms in Wielko-Polska region of Poland. According to the result of the study, agro-tourism activities constitute a significant example for the presence of good relationship between economic development and local community in Wielko-Polska.

Bursa Plain is a natural source worth of protection due to its suitable climate, proximity to great centres of the country and high agricultural potential. However, industrial, trade and housing zones are built on agricultural soils. Because of misuse of land, Bursa Plain rapidly turns into urban land use and agricultural lands are destructed. This situation affects also rural settlements on Bursa Plain negatively in many aspects. Soil texture and structure are destroyed in an agricultural land on which housing is realized. Therefore, it is quite impossible to make this kind of land reusable for agriculture (Arınç, 2003:106).

This study attempts to determine the potential of agro-tourism with the help of GIS by evaluating various agricultural characteristics of Bursa Plain. The answers to questions like "Is Bursa Plain a suitable place for agro-tourism? Can agro-tourism activities be conducted on this plain? What is the distribution of agro-tourism on research area?" have been sought.

# 2. Material And Method

Main material of this study is Bursa Plain, which is located within the borders of Southern Marmara Part of The Marmara Region. Yunuseli Neighborhood is situated in the west of the Plain, Gölbaşı Neighborhood in the east, Kazıklı Neighborhood in the north and Şirinevler Neighborhood in the south. Furthermore, the Plain is bordered by Uludağ (2543 m) in the south, Mudanya Hills and Mount Katırlı in the north (Figure 1). The surface area of Bursa Plain is about 208 km<sup>2</sup>. Bursa Plain is sort of a filled area serving as a local base level for rivers flowing from high areas surrounding the Plain. It was made up of accumulation of the elements (clay, silt, sand, pebbles, blocks) from clay to blocks of different sizes carried by these rivers. The Plain is 50 m above sea level on the plain base and 200 m at the edges. The average height of Bursa Plain is 100 m.



Figure 1: Location map of the research area.

Bursa Plain is a transition area between Mediterranean and Black Sea climate. Although Mediterranean climate is found, temperature is not so high. It is not so dry in Summer and it receives more rainfall than the Mediterranean Region. Annual average temperature is 14.5 °C in Bursa. According to long term average temperatures (1970-2014), July is the hottest month in the city with 22.54 °C, the coldest month is



February with 3.92 °C. According to long-term average rainfall (1970-2014) data by Bursa weather station, the highest rainfall in the city is in October (63.8 mm) and the lowest rainfall is in August (12.44 mm). The plain is rich in underground and surface water resources. A significant amount of the water extracted is used for the irrigation of agricultural lands on plains. Zonal and azonal soil types occur over Bursa Plain. Non-calcareous brown forest soils and brown forest soils from the group of zonal soils, and alluvial soils and colluvial soils from the group of azonal soils spread over Bursa Plain and its neighborhood.

Bursa has an area of 1.088.638 hectares but 340.912 hectares of this area are used for agriculture.

Only 31,3% of total land area is utulized as agricultural land. In 39,9% of the cultivated land area (340.912 hectares) of Bursa, fruit, vegetables, vineyards and olives are grown. If districts are evaluated in terms of fruit production, pear is grown mainly in Gürsu and Kestel. Peach gardens can be heavily seen in Bursa Plain. In 41,8% of the cultivated land area (340.912 hectares) of Bursa, field crop farming is performed.

Because of lack of meadow and grassland in Bursa, intensive animal farming, particularly cattle farming heavily, in open and closed stables is common. Bovine, ovine and poultry breeding are of great importance for animal farming in Bursa.

Development stages the plain has undergone since the 16. century are categorized as; cereal agriculture and livestock farming during the 16.century, sericulture during its heyday, the 19.century, the period of the recession of sericulture and revival of dry farming, fruit and vegetable growing period (Tolun, 1964:165). Today, irrigated vegetable and fruit farming and intensive cattle farming are performed on Bursa Plain. Even though apple and pear gardens are seen locally on Bursa Plain, they are not as important as peaches. Economic value of vegetable farming on Bursa Plain is as much as fruit farming. It is striking that vegetable and fruit farming on the majority of the plain is performed as interculture farming (Arınç, 2003:105). Bursa Plain is totally covered with alluvial soils, but the use of most of these lands for non-agricultural activities like settlement and industry makes these lands, composed of alluvial soils where fruit and vegetable farming based irrigated farming is conducted, confined only to the areas around Çeltik, Yeniceabat, Dereçavuş which are located in the northwest of the plain and Ağaköy, Cambazlar, Adaköy and Serme which are located in the northeast of the plain. Agriculture based on fruit farming is practiced on the lands. The fruits grown most on the plain are; peaches, pears, apples and quinces (Ertürk, 2008:94). Some of the lands on Bursa Plain where there are peach, olive or vegetable gardens have been transformed into industrial zones by investors. Investors think that industrial plants are more profitable than fruit gardens. The same danger is true for Demirtaş, Kestel and Gürsu Municipalities, located on Bursa Plain, too. Demirtaş industrial area has been given the status of organized industrial zone. Consequently, the area of this industrial zone is constantly extended against plain preservation zone. The area designated as industrial zone in Kestel Municipality is a in the 1.class plain preservation zone. Housing that occurs around Bursa poses a danger for agricultural lands on the plain. Like in Kestel Municipality, industrial zone in Gürsu Municipality is also within the borders of plain preservation zone. Today approximately 70% of the population outside the centre of Bursa still live on agriculture but the arable agricultural lands on Bursa Plain are gradually diminishing due to unplanned construction and industrialization (Figure 2).



Figure 2: Usage Capability Map of Bursa Plain Field.



The fact that Bursa Plain (Photo 1) has economic value paved the way for the establishment of many settlements. Bursa (with ancient names Prusa ad Olympum), which is one of the earliest cities in Turkey, developed at the south of the Plain. A significant network of transportation was set up in Bursa Plain; hence, the roads have continuously enlarged the land in disadvantage of agricultural fields. Touristic areas at Bursa Plain and its vicinity are important for agro-tourism.

The study benefitted from the maps prepared employing GIS. *Weigted Overlay*, a GIS tool, analysis was employed in order to designate fields within the Plain that are suitable for tourism.

The parameters employed in the study have been obtained from various institutions and establishments. The data of slope, settlement density, distance to streams and roads has been acquired from the topographic map with 1 / 25.000 scale obtained from General Command of Cartography. Employing map with 1/25.000 prepared by the Directorate of the Department of Study and Project, General Directorate of Rural Services, data of land, field usage has been formed. As for the data related to tourist attractions, it was obtained from Bursa Municipality. In designating approximity to streams, roads and touristic attractions, Buffer analysis, a GIS tools, was employed. Temperature and precipitation parametres were not employed due to the fact that there were no significant changes in temperature and precipitation difference within the borders of the plain.

In this study, the grading scale Kiper and Arslan (2007) was evaluated in the category of (9-6) most suitable, (6-3) suitable and (3-1) not suitable. The values varying between 1-9 were given as effect value to the criteria for agriculture whereas percentage values were given as weight-value (Table 1).

Processing the grades of designated parametres, raster maps of 10x10 resolution were produced. Then, the concerned maps were put together and overlayed; hence a map of potential areas for agro-tourism was obtained (Özşahin and Kaymaz; 2014:244). Accuracy of the map of potential areas was checked with field study. Moreoever, obtained results were also evaluated with SWOT analysis.



Photo 1: Bursa Plain (Gürsu) Table 1: Parameters employed in Agro-Tourism and their effect-weight values.



Effective Parameters	Parameter Category	Effect Value	Weight Value
	0-2	9	
Slope (°)	2-5	7	10%
Slope ( )	5-15	5	
	15-100	ī	
	Alluvial	9	
Soil	Colluvial	9	25%
501	Brown forest soil	8	
	Non-calcerous brown forest soil	7	
	Ι	9	
Land Use	П	9	25%
Land Use	III	8	
	VI	3	
	VII	3	
	VIII	1	
Dravinsity to Starson (m)	0-500	9	15%
	500-1000	6	
Proximity to Streams (m)	1000-2000	4	
	2000-5000	2	
	Scarce	1	
Settlement Size (person)	Medium density	5	5%
Settlement Size (person)	Dense	7	570
	High density	9	
	0-1000	9	
Transportation (m)	1000-3000	7	10%
Transportation (m)	3000-5000	5	
	5000-10000	1	
Distance to Tourist Attractions (m)	0-500	9	
	500-1000	7	10%
	1000-3000	5	
Autacuons (m)	3000-5000	1	

# 3. Findings And Discussion

*Morphometric Characteristics:* The average height of Bursa Plain is 100 m. General slope in the Plain is from the east to the west. The slope at the south of the Plain is more in comparison to the north. The most important reason for this is Uludag rises like a wall right behind the plain. The slope values vary between 15-100° in Çataltepe neighborhood at the south, Dışkaya, Iğdır, Karahıdır neighborhood at the north and Dudaklı neighborhood at the west (Figure 3).

*Hydrographical characteristics:* Nilüfer Stream, which has its source from the southern mountainside of Uludağ, is one of the most significant water sources of Bursa. In the plains where Nilüfer Stream passes through watering is done partly from Nilüfer and its creeks; moreover, drinking water and usage water are also supplied from this water source. Göçük creek that streams near Kestel flows between Deliçay and



irrigation canals. However, Gölbaşı Dam is significant for the irrigation of the eastern part of the Plain (Figure 3).

*Soil Characteristics:* there are zonal and azonal soil group prevalent in the Plain. Zonal soils are not suitable for agriculture for the fact that they are usually found in higher fields and sides, and in sloping lands, and that they are exposed to abrasion and for unsuitable climate conditions. Brown forest soils are rich in terms of organic ingredients for they are developed under forest cover. However, non-calcareous brown forest soil is usually formed under cover of deciduous tree forests and shows slight acidic reaction due to over wash. In azonal soil group, alluvial soils and colluvial soils that account for the most fertile agricultural fields that increase agriculture potential of Bursa Plain become prevalent (Figure 3). Especially, alluvial soils that are the most suitable soil type for agriculture in agro-tourism cover 88,64% of the plain whereas colluvial soils cover 2,28%. Following alluvial and colluvial soil types, the other most significant soil type is brown forest soils accounting for 2.70% of the land area. Unclassified soils are not suitable for agriculture with area of 6,37% (Figure 3). Farming based on fruit growing is done in alluvial soils. The most common products are; peach, pear and apple.

*Land Use:* There are various land use classifications in Bursa Plain. Land use classifications play a significant role in determining potential areas in agro-tourism. Agricultural fields consisting of excellent land use forms bear the most appropriate characteristic in terms of agro-tourism.

In the Plain, the first class lands spread to 17.60% (tillage lands suitable for agriculture) while second class lands spead to 78.27% (tillage lands suitable for agriculture) (Figure 3). Spread of excellent lands, a class among land use categorizations, to wide area is significant for agro-tourism to be applied in the plain. 85,86% of Bursa Plain's land use type is aqueous garden, 8,82% is irrigated farming, 2,68% is moor and the rest consists of lands such as dry farming, olive grove, dry garden and meadow (Figure 3).

Settlement characteristics: In agro-tourism potential, it is crucial to have villages, towns, farmhouses and their preservation. The population in the Plain varies between 35-79540 (Figure 3). The density of settlement population in the west is more in comparison to that of the east. The area with the highest settlement density is Gürsu Municipality with 79.540 people. However, the area with the least settlement density is Ahmet Vefik Paşa with 35 people.

*Transportation:* The fact that average altitude of the Plain is low, it has positive features in respect to transportation. A significant network of transportation was established; hence, the roads enwidened the area continuously in a way unfavorable to agricultural fields (Figure 3).

*Tourist attractions:* at the east of Bursa Plain is Gölbaşı pond where amateur fishing and water sports can be performed; at the northeast of the plain is Dışkaya village where paragliding can be performed; at Çekirge locality is thermal tourism and that there are convention and fair as well as culture tourism areas are important for agro-tourism to be practiced in the plain (Figure 3).



Figure 3: Parametres effective in agro-tourism potential at Bursa Plain A) Slope analysis of Bursa Plain B) Hydrographic Map of Bursa Plain C) Land use map of Bursa Plain D) Major soil groups map of Bursa Plain E) Distrubition of settlements in Bursa Plain according to size of population F) Transportation in Bursa Plain G) Distance to tourist attractions in Bursa Plain (m).



According to the map of areas suitable for agro-tourism, obtained as a result of the analysis of the measurement of values in weight value of factors effective in agro-tourism potential of Bursa Plain, it is determined that 3,86% is the most suitable, 81,48% is pretty suitable, 8,61% is suitable, 5,59% is satisfactorily suitable and 0,56% is not suitable (Table 2).

Table 2: According to the map of areas suitable for agro-tourism, obtained as a result of the analysis of the measurement of values in weight value of factors effective in agro-tourism potential of Bursa Plain.

Suitability Category	Area (ha)	Percentage (%)
The most suitable	108314000	3,86
Pretty suitable	108314000	81,48
Suitable	11448700	8,61
Satisfactorily suitable	7299600	5,49
Not suitable	748100	0,56
Total	132935400	100,00

In 0-2° sloping land where altitude is low, at the close vicinity of water resources such as Nilüfer Stream, Kırkpınar Creak and Gölbaşı Dam where alluvial soils spread widely; areas near I. II. class soils near important highways and touristic attractions where watery garden and irrigated farming are performed found intensely are suitable and very well suitable areas. (From the East to the West Dudaklı, Narlıdere, Barakfaki, Serme, Karahıdır, Kale Gürsu Belediyesi, İsabey, Samanlı, Millet, Soğanlı, Demirtaş Dumlupınar, Demirtaş Cumhuriyet, Mehmetakif, Alaşar and Yunuseli neighborhoods etc.) (Figure 4).

In use of lands in areas where altitude is high in the plain, areas with 15-100° slope, brown forest soils are prevalent far from significant water sources (Nilüfer Stream, Kırkpınar Creak), VII. and VIII. class soils are intense, moor and uncategorized areas, areas with low density of settlement, areas far from significant highways and tourist attractions are the ones less suitable for agro-tourism. (From East to West, Gölbaşı, Dışkaya, Ağaköy, Kazıklı, İsmetiye, Hasanköy, Cambazlar, Panayır neighborhoods etc.) (Figure 4).



Figure 4: Potantial areas of Bursa Plain for agro-tourism according to their class of suitability.

Strengths

The fact that trees such as peach, pear, apple, olive, fig, and strawberry in the rural areas of Bursa Plain are widely spread is significant for the application of agro-tourism.

SWOT analysis, which was performed in respect to agro-tourism in Bursa Plain, is illustrated in Table 3. In this chart, strength and weaknesses as well as pros and cons of the plain in terms of agro-tourism are shown.

Strengths	weaknesses	
High potential of agriculture on the plain	The plain is in a first-degree earthquake zone	
The slope and height values of the plain are suitable for agro-tourism.	Peach gardens are converted into building lands, and industrial, residential and commercial buildings are constructed on these lands	
The existence of water sources		
The existence of fertile soils (alluvial, colluvial)	Olive trees are cut down and housing zones are constructed in place of them	
The practice of irrigated garden and irrigated farming on the plain	The use of arable alluvial soils for non-agricultural activities	
The spread of class II soils (arable soils) over	Lack of knowledge on agro-tourism	
large areas	Lack of any infrastructure for agro-tourism on the plain	
Proximity of the plain to important highways		
Tourist attractions on the plain and its neighborhood	Agricultural products are not converted into tourist products	
Peach trees are very common on the plain		
Advantages	Disadvantages	
Agriculture and livestock breeding have been performed on the plain since the 16th century	Migration from rural to urban areas	
A significant transportation network has been	The use of agricultural areas for industry	
set up on the plain	The danger of the extinction of agricultural lands	
Agricultural activities are practiced on the plain	Mass housing projects on the plain	
The possibility to promote local agricultural products to visitors	Rapid spread of housing on the plain	

Table 3: SWOT analysis performed with regards to agro-tourism in Bursa Plain.

Weaknesses

# 4. Conclusions

The agro-tourism potential of Bursa Plain was attempted to be determined via GIS evaluating various agricultural characteristics. It was determined that 85,33% of the research area is the most suitable and pretty suitable for agro-culture potential (From the East to the West Dudaklı, Narlıdere, Barakfaki, Serme, Karahıdır, Kale Gürsu Municipality, İsabey, Samanlı, Millet, Soğanlı, Demirtaş Dumlupınar, Demirtaş Cumhuriyet, Mehmetakif, Alaşar and Yunuseli neighborhoods etc.). In the distribution of suitable areas, slope, proximity to streams, soil, land use, settlement size, transportation and tourist attractions have been effective.

There has been no activity performed within the scope of agro-tourism in the plain, a significant natural resource for Bursa. In addition, agricultural fields in the plain are day-by-day getting narrower due to unplanned housing and industrialization. Followings are the things to be done primarily in order for agro-tourism to be applied in Bursa Plain:

• Using the advantages of widespread dispersion of trees such as peach, pear, apple, olive, fig, strawberry, to perform activities to reinvigorate agro-tourism potential and to advertise them.

• Regional products manufactured by local people can be offered to tourists and thus incomes of local people can be increased.

• Performing organic agriculture in the Plain, places where organic products are sold should be built.

• In order for local handicrafts, which may form attractiveness for agro-tourism, not to disappear, it is essential to show required efforts.

• Seasonal fruits (peach, pear, apple, etc.) should be plucked and advertised as part of a festival.

• Local people should be provided with the opportunities of participating in agro-tourism activities, diversification of activities and selling products in bazaars.

• Environment for local people to market their handicrafts, produce local plants and market them should be established.

• As in samples from abroad, agro-tourism activities in our country should be diversified.

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