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SECTORAL EFFECTS OF 1915 ÇANAKKALE BRIDGE ON BIGA AND BANDIRMA*

1915 Çanakkale Köprüsü'nün Biga ve Bandırma'ya Yönelik Sektörel Etkileri

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Abstract: This study was carried out in order to reveal the sectoral effects of the 1915 Çanakkale Bridge on Biga and Bandırma districts, which were determined as pilot cities. The possible impact of the bridge on Biga and Bandırma districts has been determined as a research problem. Accordingly, a literature review was conducted on the 1915 Çanakkale Bridge Highway Project and its effects on the immediate environment. Accordingly, the course of the sectoral impact according to the selected years in Biga and Bandırma districts was discussed in line with the 1\100.000 Environmental Plan decisions. According to this; the current sectoral status of Biga and Bandırma districts and their population acceptance status were compared according to the scenario in 2040. According to the research results; it is expected that the 1915 Çanakkale Bridge will have various effects on all the cities in the region, especially the cities of Biga and Bandırma. It is predicted that there will be an increase in the population projections of Biga and Bandırma districts in 2040. The 1915 Çanakkale Bridge is expected to have a significant impact on the transportation times on the Anatolian and European sides. It is seen that the coastal part starting from Ezine in Southern Marmara to Bandırma stands out as the "olive corridor". According to the results of the research, the following suggestions were made. The concept of "threshold synthesis" should be taken into account in land planning in the cities of Biga and Bandırma.

Keywords: 1915 Çanakkale Bridge, Biga, Bandırma, sectoral impact.

Öz: Bu çalışma, 1915 Çanakkale Köprüsü'nün pilot kentler olarak belirlenen Biga ve Bandırma ilçelerine yönelik sektörel etkilerini ortaya koymak amacıyla gerçekleştirilmiştir. Köprünün Biga ve Bandırma ilçelerinde oluşturacağı muhtemel etki, araştırma problemi olarak belirlenmiştir. Buna bağlı olarak, 1915 Çanakkale Köprüsü Otoyol Projesi ve yakın çevreye olan etkileri ile ilgili literatür taraması yapılmıştır. Buna göre Biga ve Bandırma ilçelerinde seçilmiş yıllara göre sektörel etkinin seyri, 1/100.000'lik Çevre Düzeni planı kararları doğrultusunda tartışılmıştır. Buna göre; Biga ve Bandırma ilçelerinin mevcut sektörel durumları ile nüfus kabul durumları 2040 yılındaki senaryoya göre

* This study was carried out with a consultant in the fall semester of the 2020-2021 academic year. In addition, it was produced by rearranging from the studies compiled after the literature review before the doctoral qualification study. The study area covers Biga and Bandırma counties.

karşılaştırılmıştır. Araştırma sonuçlarına göre; 1915 Çanakkale Köprüsü'nün başta Biga ve Bandırma kentleri olmak üzere bölgedeki tüm kentlere çeşitli etkilerinin olması beklenmektedir. Biga ve Bandırma ilçelerinin 2040 yılı nüfus projeksiyonlarında artış yaşanması öngörülmektedir. 1915 Çanakkale Köprüsü'nün, Anadolu ve Avrupa yakasındaki ulaşım sürelerine önemli bir etkisinin olması beklenmektedir. Güney Marmara'da Ezine'den başlayarak Bandırma'ya kadar uzanan kıyı kesiminin, "zeytin koridoru" olarak öne çıktığı görülmektedir. Araştırmadaki sonuçlara göre şu önerilerde bulunulmuştur. Biga ve Bandırma kentlerindeki arazi planlamalarında "eşik sentezi" kavramının dikkate alınması gerekmektedir.

Anahtar Kelimeler: 1915 Çanakkale Köprüsü, Biga, Bandırma, sektörel etki.

INTRODUCTION

Along with the developing technology with the Industrial Revolution, the change process in nature has gained a great speed. This process refers to the period called the anthropocene, when the human pressure on nature was clearly felt (Abdollahi and Oktay, 2020). The anthropocene, which marked man's becoming a force influencing the bio-physical processes of the planet, also changed the current perception of security. Because the new conditions arising from human influence have begun to affect the nature of threats (Kaya, 2019). As in the world, the basis of the factors that started the anthropocene period in Turkey is the wrong or faulty land use. The use of forest lands as agriculture, agriculture and forest lands as pasture, and agricultural lands as residential and industrial areas becomes the main factor in natural environment degradation (Efe et al., 2008a; Efe et al., 2008b). In this sense, the thoughts about moving the small awareness that started with personal acquisitions to collective and mass dimensions in order to end the urge to use and destroy the natural resources that nature and life offer to human beings began to make sense (Ünal, 2019).

The challenges of the 21st century, resource constraints, financial instability, inequalities within and between countries, environmental degradation indicate that the Earth's usual routine cannot continue. After the Industrial Revolution, a series of challenges and opportunities were faced in connection with the demographic and environmental pressures that changed due to increasing urbanization. In this process, rapidly increasing new inventions and the discovery of new places have increased the luxury of human beings to act according to their wishes. Uncertainties in land use and planning, climate change put pressure on central governments and local institutions to adapt and resilience, as well as some uncertainties. Studies on land use become more important in order to effectively implement key functions related to these uncertainties (Ertek, 2016; Polat and Kahraman, 2019).

In recent years, there has been an increase in studies on the 1915 Dardanelles Strait. E.g; Apaydın and Baş (2018) investigated the role of long-span bridges in transportation systems. Aydın and Perk (2012) stated that the positive and negative externalities of the 1915 Çanakkale Bridge should be taken into account, and the long-term damages and advantages of negative externalities to the region should be put forward concretely. Giannakou et al. (2019) carried out advanced numerical analyzes for tower performance and liquefaction in the study titled "Evaluation of Lateral Spreading Demands at the 1915 Çanakkale Bridge Tower Foundation". Tanoğlu et al. (2019) investigated the expectations of the people of Lâpseki about the 1915 Çanakkale Bridge.

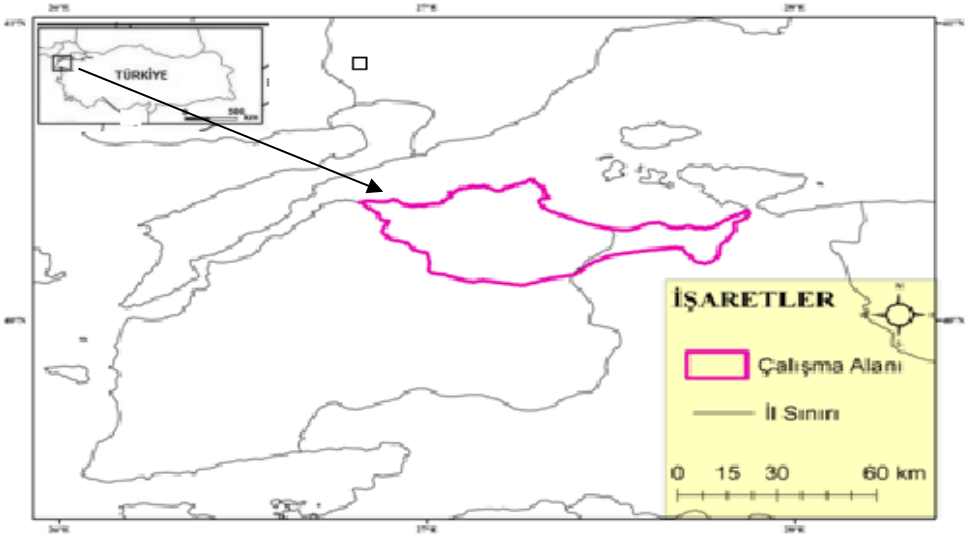
In the literature review on Environmental Planning, studies covering the provinces of Mersin, Adana, Denizli, Konya, Istanbul and Thrace sub-region were reached (Erdem et al., 2008; Çetinkaya, 2009; Yenice, 2012; Turgut and Seççiler 2017; Sönmez 2018; Erbaş, 2018) . Studies have been reached in the provinces of Istanbul, Tekirdağ, Kocaeli and Southern Marmara, including the provinces of Çanakkale, Balıkesir, Bandırma, throughout the Marmara Region (Uysal, 2008; Sönmez, 2016; Eryiğit, 2017; Söylemez, 2019).

In the research literature, making estimations about land use and understanding the change in land use on a temporal-spatial scale have been seen as an important parameter for the rational use of

natural and cultural resources (Aydın, 2011; Öztürk, 2013; Cengiz and Yılmaz, 2016; Rimal, et al., 2017). Because the detailed determination of land use is important for decision makers, planners, practitioners and researchers to be able to carry out effective planning activities, land management and investment activities (Doğan and Buğday, 2018; Yazıcı et al., 2019). For this reason, studies on land use predictions are gaining in importance (Çağlıyan and Dağlı, 2015; Öztürk and Gündüz, 2020).

A significant part of the field studies in Turkey is directed towards the city of Istanbul due to its population and industry influence. The main reason for this situation is that Istanbul's location on a national and international scale and its potential values are open to change and confusion (Seydanlıoğlu and Turgut, 2017). Döker (2012a) and Döker (2012b) studies for the city of Istanbul; it consists of examining the trend change in the Marmara coastline. Another study for Istanbul is the study of Geymen and Baz (2007) on the change in land use in Istanbul. The city of Istanbul has always been popular. Accordingly, urban settlements, industrial investments, urban settlements have taken on the role of a center of attraction in the development processes of the spatial Istanbul city (Özcan and Gündoğar, 2015). It has been determined that the integrated shoreline is neglected in most projects originating in Istanbul. For example; it is expected that projects such as Tire Tube Crossing Project in the Bosphorus, Third Bridge and Ring Roads Project, Gulf Crossing Project, Third Airport Project, Channel Project will affect the silhouette values and macroform of Istanbul. It is seen that these projects, which are expected to affect the living spaces in Istanbul, contradict the principles of the 1/100,000 Scale Environmental Plan, which is the constitution of the city (Kılıç et al., 2014). A similar situation, which contradicts with the planning principles, can be seen in the Çanakkale 1915 Bridge, which is under construction, and in the planning reports of this region.

Due to the 1915 Çanakkale Bridge and the effects of heavy industry focused on Istanbul, the pressure expected to occur in the South Marmara Region is expected to intensify especially in the cities of Biga and Bandırma. However, the cities of Biga and Bandırma seem quite far from a holistic perspective that can meet the physical and social processes in the face of this density that may occur.



Map 1: Study Area Location Map

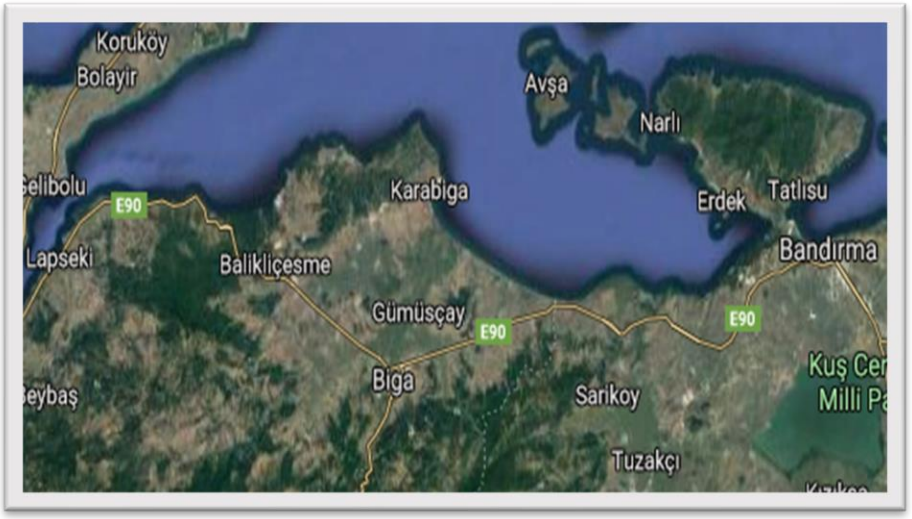


Image 1: Study Area Satellite Image

Different studies have been carried out in the field of study. E.g; Ertin (1993) conducted a study on the classification of economic function areas of Bandırma. Soykan and Cürebal (1999) investigated the coastal geomorphological features of the Gönen Stream and the Belkıs tombolo. Okumuş (2006) stated that a possible rise in sea level may adversely affect the region regarding the use of the coasts between Biga Stream and Gonen Stream. Alpar (2009) put forward the worst scenario for the coasts of Erdek and stated that the sea level will rise by 17.2 cm in 2025, and that the plains here will be invaded by the sea unless precautions are taken. Akyar and Çelik (2018) examined the socio-economic status of Bandırma port with regression analysis depending on the years. Doğan and Nemutlu (2018) mentioned the importance of Karabiga Region as an agricultural heritage from past to present. Tektaş et al., (2019) examined the current transportation system of Bandırma and suggested solutions to the transportation problems that may occur in the future after the realized projects. Tektaş and Aslan (2019) examined the current opportunities and threats by revealing the strengths and weaknesses of transportation in Bandırma. Söylemez (2019) underlined that Bandırma is one of the important industrial centers of Turkey. Kaya and Görgün (2020) examined the change trend of land change in the city of Bandırma between 1987 and 2019. Nemutlu and Doğan (2020) conducted research on the conservation and development of the natural and cultural resources of the Karabiga region.

Uysal (2006) conducted a study on planning research in the Marmara Region. In the study, in which development schemes for the Marmara Region were created, the position and role of Çanakkale in the region were evaluated. Sergeant (2014) conducted a land-use suitability study for the eastern shores of the Dardanelles. He said that the developments that will arise due to the construction of the bridge will require new decisions regarding the space. Tanoğlu and Yücesan (2020) stated that the 1915 Çanakkale Bridge will have regional effects both in the construction and operation phases, and that this effect will change the economic flow between Istanbul and other provinces of the region in favor of underdeveloped regions.

When the studies carried out throughout the Marmara Region are examined; in recent years, it is seen that land use planning, land use suitability studies, operations researches on coastal management have gained momentum. However, the lack of research on the effects of the 1915 Çanakkale Bridge on these cities in the case of Biga and Bandırma draws attention. This situation constitutes the problem of the research.

For the Bandırma district, which has become a hinterland from Karacabey to Biga, there has been a thought for a long time to shift heavy industry investments. Industrialists involved in sectors such as Iron Steel and chemistry, whose environmental impacts are controversial, purchase land

in the area between Şirinçavuş and Hıdırköy. The mobility in land use is followed by developments in the energy sector. In particular, thermal power plants and industrial investments are expected to leave their mark on the region in the near future. In the face of these developments, there is no planning that includes settlement and land use in the region. In order to shed light on the answer to this question, first of all, it is necessary to analyze the sectoral structure around Bandırma and Biga correctly.

Document analysis method was used in the research. Ministry of Environment and Urbanization Balıkesir-Çanakkale Planning Region 1/100.000 Environmental Plan was examined by document analysis method and evaluated in line with the relevant sources. In the light of the predictions stated in the plan, possible situations for Biga and Bandırma districts have been interpreted. Document review includes the analysis of materials containing information about the events targeted to be investigated (Yıldırım & Şimşek, 2013).

1915 Çanakkale Bridge and Highway Project

1915 Çanakkale Bridge is being built between Lâpseki and Gelibolu districts of Çanakkale province in Turkey. The project, which is the first suspension bridge of the Dardanelles Strait and the fifth of the Marmara Region, is expected to operate as a part of the Kınalı-Tekirdağ-Çanakkale-Balıkesir Highway, which is still under construction when completed. The bridge is planned to be put into service on March 18, 2022.

When the bridge project is completed, it is expected that Lâpseki district and Malkara districts will be connected to each other by road. Covering a distance of approximately 5 kilometers, the bridge reaches a total of 88 kilometers of highway with 13 kilometers of connection roads. The 1915 Çanakkale Bridge, which was built to provide entrance and exit from 6 junctions, connects the Sütlüce Village 10 km south of the Gelibolu district on the European side and the Lâpseki district on the Anatolian side. While the Asian continent junctions are around Umurbey and Lâpseki, the European side junctions consist of points around Gelibolu, Kavakköy, Güneyli and Malkara. The middle span of the bridge is 2023 meters, the side spans are 770 meters, and the approach viaducts are designed as 365 to 680 meters. Çanakkale Bridge, which is projected to have a total length of 4,608 meters, is expected to be the longest mid-span suspension bridge in the world with a middle span of 2023 meters. The road distance between Lâpseki and Gallipoli is expected to be 6 minutes (Anonymous, 2021).

Planning and Landscaping Plans

Planning is defines as the determination of the increase measures determined by the governments for a certain purpose and the preparation of social programs for a certain period according to these socio-economic indicators (Türk Dil Kurumu, 2021). The plans serve the purpose of providing long-term cooperation between the public and public institutions (Devlet Planlama Teşkilatı, 2006).

Due to its place and importance in the planning hierarchy, Environmental Plans offer the opportunity to integrate national-scale planning with local-scale planning. However, the lack of regional planning tradition in Turkey causes this opportunity not to be used. Therefore, basin-based planning is needed (Uluçay, 2020).

It is seen that the zoning plans in Turkey are in the form of linear plans obtained by associating them with cadastral plans and current maps. Cadastre plans are in the form of linear plans obtained by associating them with existing maps. Since these plans are prepared without considering local conditions, without analyzing the natural environment-human relationship and without considering the necessary data, they cause similar plans to emerge in the short term. For this reason, first of all, local planning elements should be determined, data analysis related to this should be done, and then physical planning studies should be carried out (Üstündağ and Şengün,

2011). Likewise, taking into account the natural factors that will emerge as a result of multidisciplinary studies provides a healthier ecological formation in land use (Cengiz and Gönünizi, 2011). Environmental Plans, which serve this purpose, appear as the constitution of the urban planning process, which provides the opportunity to integrate national-scale planning and local-scale planning, since they are in a hierarchy between regional planning and local planning (Kılıç et al., 2014; Uluçay, 2020). Balıkesir-Çanakkale Planning Region 1/100.00 Environmental Plan has been approved by the Ministry of Environment and Urbanization (Ministry) with the Decree-Law dated 20.08.2014 and numbered 13549 (Çevre ve Şehircilik Bakanlığı, 2014).

Physical and Human Situation in Biga District

The name of Biga district, located on the Biga peninsula, comes from the Greek word "Pega" meaning "source" and "spring". Throughout history, the city has been dominated by Ionia, Lydia, Macedonian Empire, Pergamon Kingdom, Rome, Byzantine Empire, Anatolian Seljuk State, Latin Kingdom, Karesi Principality and Ottoman State (Biga Belediyesi, 2021). It became a district with the Constitutional Law No. 85 adopted by the Turkish Grand National Assembly on January 20, 1921. There are Çan districts in the south of Lâpseki in the west of the county, which is approximately 90 kilometers away from Çanakkale. There is also Gönen in the east and Yenice in the southeast (Biga Kaymakamlığı, 2021).

The topography in Biga district is generally flat and the average elevation is around 50-60 meters. The most important stream in the district is the Kocabaş Stream, which arises from the Kaz Mountains in Karabiga, which is within the borders of the district, and empties into the sea. Kocabaş Stream has two important branches, Bakacak and Hoşoba. In addition, Hoyrat lake between Güvemalan and Gerlengeç villages constitutes another important water body in the district (Biga Kaymakamlığı, 2021).

The eastern, western and southern parts of Biga district consist of lands in the form of coppices and groves. Forest areas in the district cover an area of approximately 59,028 hectares. In general, 78 of the settlements in the district, where there are 110 settlement units, are located in the plains, and 33 of them are located in the mountainous rural land (Biga Kaymakamlığı, 2021). In this sense, Biga district, 47% of which consists of forest areas; it is an important rice, milk, meat, vegetable and fruit center of Turkey with its 108 villages (Biga Ticaret ve Sanayi Odası, 2021).

Biga district has a climate where Mediterranean, Black Sea and continental climates form a transition zone. In autumn and winter, precipitation falls; summer months are generally hot (Biga Kaymakamlığı, 2021).

The fact that the industry in Istanbul, which is the center of the Turkish economy, has reached the maximum level, has made the Biga district a center of attraction for local and international investors. This rapid change in economic terms has made it necessary to develop planned approaches before problems occur in industry, agriculture and environmental sectors, including regional plans, environmental plans (Biga Ticaret ve Sanayi Odası, 2021).

Organized Industrial Zone, which was established in Biga district in 1995, stands out with companies that mainly produce iron, steel and food (Güney Marmara Kalkınma Ajansı, 2020). Biga district has important highway connections to centers such as Balıkesir, Bursa, Çanakkale, Gönen and Karacabey. It also has 72 kilometers of coastline. The district has made significant developments in the industry and trade sector in recent years. There are many enterprises in the district where agriculture-based industries are located. Among these, agricultural machinery production, meat and milk processing facilities, vegetable-fruit processing facilities, DEMKO Demirci Konservecilik A.Ş. There are flour factories, feed factories, paddy processing factories, tomato paste and canned food factories. In addition, İÇDAŞ Çelik Enerji Shipyard and Transportation Industry Inc., DOĞTAŞ Furniture Factories stand out as companies operating worldwide (Biga Belediyesi 2021; Biga Organize Sanayi Bölgesi, 2020).

Karabiga town, which stands out as an important touristic center in Biga district, is a rural coastal area and its use is rapidly changing with thermal power plants. In addition, agricultural lands in the region are under intense industrial pressure. In this respect, some of the area analyzes for the region are in the direction of moving the industrial areas that are developing rapidly and destroying the coastal region to different regions with new plans to be made by considering ecological factors, while the fact that some of them are on industry increases the contradictions for this area. The impression obtained after the field analysis for Karabiga town; industry and tourism areas are planned without considering the regional values, and wrong location choices are made for the use of the area. The thermal power plants established in the coastal area near the ancient city cause environmental and visual pollution. In addition, industrial-based population and structural development are increasing. In the event that developments in this direction gain momentum, the thoughts that the ecological balance will deteriorate in the future and agricultural production may be abandoned gain importance (Doğan and Nemutlu, 2018; Nemutlu and Doğan, 2020). In addition, it is known that Denizkent, Denizati, Kumkent holiday sites where holiday homes are located in the district and small cooperatives in the vicinity were built by draining the swamps on agricultural lands (Okumuş, 2006). Therefore, this fierce competition between industrial facilities and agricultural areas is an issue that needs to be resolved sensitively in accordance with the protection-use balance approach. Gümüşçay Town, which stands out with agriculture, tourism and agriculture-based industries in Biga district, constitutes the second town of Biga district. The history of the town stretches from the Persians to the Ottoman Empire (Gümüşçay Belediyesi, 2021).

According to the Balıkesir-Çanakkale Planning Region report, development areas are suggested considering the progress of settlement in Biga district, spatial use in 2040, and legal, artificial and natural thresholds in the northeast and west of the settlement (Çevre ve Şehircilik Bakanlığı, 2014).

Physical and Human Conditions in Bandırma District

Information about the foundation of Bandırma points to prehistoric times (Bandırma Belediyesi, 2020). Bandırma connects the provinces such as Çanakkale and Balıkesir in the Marmara Region to the Central Anatolia Region and the Aegean Region. It is the export and import gate of the region with its strong land and railway connections. Bandırma Port is located in the Southern Marmara hinterland. It provides services to most importer and exporter companies with its Ro-Ro terminal, where an average of 600 trucks pass daily, with containers, liquid and solid bulk, packaged general cargo loads, project cargo loads. These services are carried out at 20 berths with a total length of 2973 meters, with depths varying between 6-12 meters. Loading-unloading services at these quays are carried out by excavators, mobile cranes and conveyor system (Akyar and Çelik, 2018). Bandırma, which has started to change and develop with the potential it has shown over time due to its port and transportation networks, is among the cities that are candidates to become a province in recent years (Ertin, 1993). Expectations in this direction are becoming increasingly important, especially due to the presence of strong transportation networks.

First of all, although scenarios related to Bandırma, which will carry the established industry of Istanbul to this region, come to the agenda, a project has not yet been put forward as to how this will happen (Söylemez, 2019). However, it is expected that the 1915 Çanakkale Bosphorus Bridge will have regional effects in this area both during the construction phase and during the operation phase. These effects are expected to change the tourism and commercial relations between the provinces of Istanbul in favor of less-developed provinces (Tanoğlu, et al., 2019).

It is aimed to renew the Bandırma-Balıkesir-İzmir railway line, which still serves Bandırma, and transform it into a High-Speed Train (YHT) line. With the renewal of the İzmir railway line and its connection to the Bandırma port, it is expected that the transportation times with İzmir will be shortened. In addition, it is aimed to shift the workload of İzmir port, which stands out as Turkey's

largest port, to Bandırma port. The 1915 Çanakkale Bridge, built for Tekirdağ-Çanakkale-Balıkesir highways, is being built to pass over the railway. With this project, it is aimed to realize the Bandırma-Çanakkale-Tekirdağ railway line. After the completion of the project, it is expected that the transportation will increase by combining the Tekirdağ- Çanakkale-Balıkesir Highway, which passes through the close vicinity of Bandırma, and the Istanbul - Bursa - İzmir Highway, over Bandırma (Tektaş, et al., 2019). In the face of these developments, the thoughts regarding the transfer of heavy industry to this region predominate. In addition, due to the fact that Bandırma is on the route of the Çanakkale 1915 Bridge and the Bandırma Port project is on the agenda, it is estimated that the population of the city will double in the next 10 years. If the current problems cannot be solved as soon as possible, it is expected that these developments will turn into chaos from being a problem in the face of possible population growth (Tektaş and Aslan, 2019).

The spatial course of the settlement in 2040 is explained in the planning region report. Accordingly, a residential and industrial area was proposed to the southwest of Edincik settlement, apart from the spatial uses envisaged in the current Zoning Plan. For the settlement, road connections with the port and the center, the south ring road and the connected railway, which also includes other industrial uses in parallel with the south ring road, are recommended. It is planned to develop a port for sea transportation for the industrial zone between Bezirci and Şirinçavuş villages. Accordingly, the development course of Bandırma city was determined as east and west directions. Considering the Manyas Wetland Buffer Zone in the southeast, the uses for industrial and storage activities are limited (ÇŞB, 2014).

Possible Plan Acceptance Situations of Biga and Bandırma Cities

In terms of the public sector, what is meant by balanced regional development is the establishment of a settlement system that best reflects production and service investments. Spatial distribution model created according to planning principles; ensures the balanced use of sustainable development. It also provides the best environment for the balanced distribution of population and income (DPT, 2003, p.11).

The year 2040 was taken as the projection year in the Balıkesir-Çanakkale Planning Region Report. Care was taken to meet the social, technical infrastructure and spatial investments in the study area in appropriate areas, taking into account natural, artificial and legal thresholds. According to the report; the Southern Marmara section stands out as the “olive corridor”. The coastal region, which includes the districts of Mudanya, Gemlik, Gönen, Erdek, Bandırma and Ezine, which have a coast on the Sea of Marmara, draws attention with its ecological importance. The presence of olive, olive oil and grape production potential in the region is interesting (ÇŞB, 2014).

Balıkesir-Çanakkale Planning Region, which covers Biga and Bandırma districts more clearly, develops in parallel with the accelerations focused on industry, trade, service, tourism and agriculture. In the report; the concept of “threshold synthesis” is underlined by emphasizing the not yet degenerated structure of the planning region. Çanakkale-Lâpseki-Karabiga-Biga-Bandırma-Gönen and Balıkesir centers are designated as "sectoral development corridors". It has been pointed out that the use of local industries in productive agricultural areas causes visual, environmental and infrastructure problems. In addition, it was emphasized that the sectoral structuring in Çanakkale, Balıkesir, Lâpseki, Biga, Bandırma, Erdek and Edincik provinces will develop in the direction of agriculture, service, industry and tourism (ÇŞB, 2014).

The spatial development scheme in the planning report is explained as follows: The cities in the study area are located in an accessible location close to metropolitan cities such as Bursa, Izmir and Istanbul. The settlement structure in the region has a structure in the form of multiple medium-sized city centers. Biga and Bandırma cities stand out as the most important service centers among the regional cities. Bandırma city has an advantageous railway connection thanks to BAGFAŞ

and TCDD ports. In addition, Bandırma is the industrial center of the region due to the presence of large-scale industrial facilities (ÇŞB, 2014).

In the context of the planning report, spatial development trends, population and socio-economic trends of Biga and Bandırma settlements, 2012 populations and 2040 population assumptions were evaluated.

Table 1. Bandırma District Plan Acceptance Population in 2012

Urban Population	Neighborhood Population	Total Population
128.091	11.783	139.874

Source: ÇŞB (2014)

Table 2. Bandırma District Plan Acceptance Population in 2040

Urban Population	Neighborhood Population	Total Population
239. 335	9.325	248. 660

Source: ÇŞB (2014)

The acceptance population of Bandırma in the 2040 projection is expected to increase by more than 100 thousand.

Table 3. Biga, Gümüşçay and Karabiga 2012 Plan Acceptance Populations

District/Town	Urban Population	Neighborhood Population	Total Population
Biga	44.289	34. 350	83.594
Gümüşçay	2.078	-	-
Karabiga	2.877	-	-

Source: ÇŞB (2014)

Table 4. Biga, Gümüşçay and Karabiga 2040 Plan Acceptance Populations

District/Town	Urban Population	Neighborhood Population	Total Population
Biga	83340	32.200	121755
Gümüşçay	2390	-	-
Karabiga	3825	-	-

Source: ÇŞB (2014)

It is expected that the plan acceptance population of Biga district will nearly double in 2040. A significant increase in the population of Gümüşçay is not expected. A significant increase in the population of Karabiga Town is not expected. According to the planning report, the numerical data regarding the agriculture, industry and services sectors for 2040 for the cities of Biga and Bandırma are as follows:

Table 5. Bandırma District 2004 Sectoral Projection

Agriculture	**Industry**	**Services**
% 31.83	% 15.77	% 52.40

Source: DPT (2004)

Table 6. Bandırma District 2040 Sectoral Projection

Agriculture	Industry	Services
% 66	% 8	% 26

Source: ÇŞB (2014)

According to the data in table 5 and table 6; it is expected that there will be significant changes in the sectoral structure of Bandırma. According to this; a two-fold increase is expected in the agricultural sector. Despite the increase in the agricultural sector, it is expected that there will be a double contraction in the industry and services sectors.

Table 7. Biga District Sectoral Projection for 2004

Agriculture	Industry	Services
% 66.58	% 8.77	% 24.65

Source: DPT (2004)

Table 8. Biga District Sectoral Projection for 2040

Agriculture	Industry	Services
% 45	% 17	% 38

Source: ÇŞB (2014)

According to the data in table 7 and table 8; significant changes are expected in the sectoral structure between 2004 and 2040. Accordingly, it is predicted that the ratio in the agricultural sector will decrease from 66% to 45%. In the industrial sector, it is expected to double from 8.77% to 17%. The services sector is expected to increase from 24.65% to 38%.

CONCLUSION AND RECOMMENDATIONS

The geographical region where the industry is concentrated in Turkey is the Marmara Region. Approximately 70 percent of the industrial establishments across the country are concentrated in 12 provinces, primarily in Istanbul. Considering the industrial structure of the developed provinces in the vicinity of Balıkesir, it is noteworthy that there is a saturation in the industry and that investment land cannot be found even for the expansion of existing investments, let alone new investments. In this context, Balıkesir province is considered as a reserve area for industrial transportation. There are 16 small industrial sites and 8 organized industrial zones in Balıkesir, 3 of which are in the establishment phase and 5 are active. Field expansion works in active OIZs are continuing. Coordination between organized industrial zones creates a strong profile for the investment environment.

In the Balıkesir - Çanakkale 1/100,000 plan, 48 thousand decares of land have been reserved for industry. Accordingly, it is foreseen that one of the largest industrial regions of Turkey will emerge. Many large industrial establishments are expected to be heavy industry and other industrial areas between Bandırma and Biga, and the northern parts are expected to be opened to energy investments.

According to the findings in the planning report; it is expected that there will be significant changes in the sectoral structure of Biga and Bandırma districts in the next 40 years. These changes are expected to affect all sectors, especially the agricultural sector. It is foreseen that the sectoral structure of the region will shift from agriculture to industry axis after the mega projects carried out in the Marmara Region and the projects related to these projects. In fact, this situation contradicts the principles of Balıkesir-Çanakkale Provinces Environmental Plan of 1/100.000. The cities of Bandırma and Biga are undoubtedly in the direction of being the locomotive cities for industry in their region. Despite these features, both cities have an extremely important place

in terms of agriculture due to their proximity to Istanbul and the existence of fertile agricultural lands. For this reason, decision makers should act by considering the agricultural importance of Biga and Bandırma cities.

The areas allocated as industrial zones in the Bandırma zoning plan are planned to become organized industrial zones (OIZ). It is thought that the industrial plant demands that will arise during the plan period will be directed to the industrial areas determined by this plan and the same industrial activity types will be brought together. Although the industrial sector is an indicator of development, it is a must to respect people and nature while industrializing. The criteria in the planning should be determined accordingly.

The following results were obtained in the research aiming to reveal the effects of the 1915 Çanakkale Bridge on Biga and Bandırma districts: The 1915 Çanakkale Bridge is expected to have significant social, economic and physical effects on the cities of Biga and Bandırma in the Marmara Region. The tendency of Biga and Bandırma to be locomotive cities in the region where they are located draws attention. The city of Biga stands out as a city focused on industry, agriculture-based industries and service at its location. The city of Bandırma, on the other hand, has the appearance of a city focused on industry, port and transportation. According to the 2040 sectoral projection, Biga and Bandırma cities are expected to maintain their weight in the agricultural sector. It is expected that the sectoral structure based on agriculture in the cities of Biga and Bandırma will turn into an industrial-oriented format due to both the effect of the 1915 Çanakkale Bosphorus Bridge and the pressure of the Istanbul industry on the working area. It is expected that the spatial usage course of 2040 in Biga district will develop in the northeast and west direction of the current settlement. The settlement center for Bandırma and industrial areas in the southwest of Edincik settlement are suggested. At the same time, road connections with port and center connections and railway connections including industrial uses are recommended. It has been determined that the development course of Bandırma district will proceed in the form of east and west directions.

It is estimated that the junctions such as Malkara, Kavakköy, Güneyli, Gelibolu, Lâpseki and Umurbey will be particularly affected by the bridge project, which is still under construction. With the completion of the 1915 Çanakkale Bridge, it is expected that the road transportation between the Gallipoli district of Çanakkale on the European continent and the Lâpseki district on the Asian continent will decrease to 6 minutes. It is thought that these current time shortenings will be reflected in the travel times of Biga and Bandırma with big cities such as İzmir, İstanbul, Bursa, Kocaeli and Tekirdağ. It is predicted that the plan acceptance population in Biga and Bandırma districts will increase significantly in 2040. It has been determined that Biga and Bandırma cities stand out as sectoral development corridors. It is noteworthy that the definition of "olive corridor" has been introduced to the coastal band, which includes the districts of Ezine, Bandırma, Erdek, Gemlik, Gönen and Mudanya.

The founding theme of the South Marmara Development Agency, which includes the cities in its study area, is based on developing two sectors such as agriculture and tourism. However, it is seen that the plans for Biga and Bandırma districts are realized on an industrial basis by the decision-making mechanisms. These developments are expected to adversely affect the tourism and olive growing sectors, which are the most important income sources of Bandırma and Erdek Bay in the long run.

Accordingly, the following recommendations were made: The concept of “threshold synthesis” should be taken into account in all planning processes for the region. It is sensitive to protect agricultural areas in Biga and Bandırma, which are determined as sectoral development corridors, and to prevent environmental and infrastructure problems that may occur in this region. In the current situation, the answer to the question of where Biga and Bandırma will grow should be revealed through participatory decision mechanisms that include the participation of local people within the scope of upper and lower-scale environmental plans. The existence of olive lands

should be protected against possible construction in the planning area. It is necessary to observe and develop healthy urbanization processes in Biga and Bandırma districts. In line with the 2040 population acceptance projection, it is necessary to create land models that take into account the land classifications in the region. It is considered necessary to take more realistic and strategic decisions for agricultural areas in Biga and Bandırma districts in order to protect agricultural areas. Ecological sensitivities should be taken into account in all kinds of land planning for the cities of Biga and Bandırma.

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ATTACHMENT

Photograph 1: Feet of 1915 Çanakkale Bridge (https://www.canakkalehaber.com/1915-canakkale-koprusu-nde-kedi-yolu-yapimi-eylul-de-basliyor/5518/)

Photograph 2: 1915 Çanakkale Bridge Cat Trail Construction (https://www.rehbercanakkale.com/1915-canakkale-koprusu-nde-kedi-yolu-da-bitiyor/6846/)

Photo 3: 1915 Çanakkale Bridge Design
(https://rayhaber.com/2020/08/1915-canakkale-koprusu-tasarimi-uzunlugu-ve-koprunun-son-durumu/)

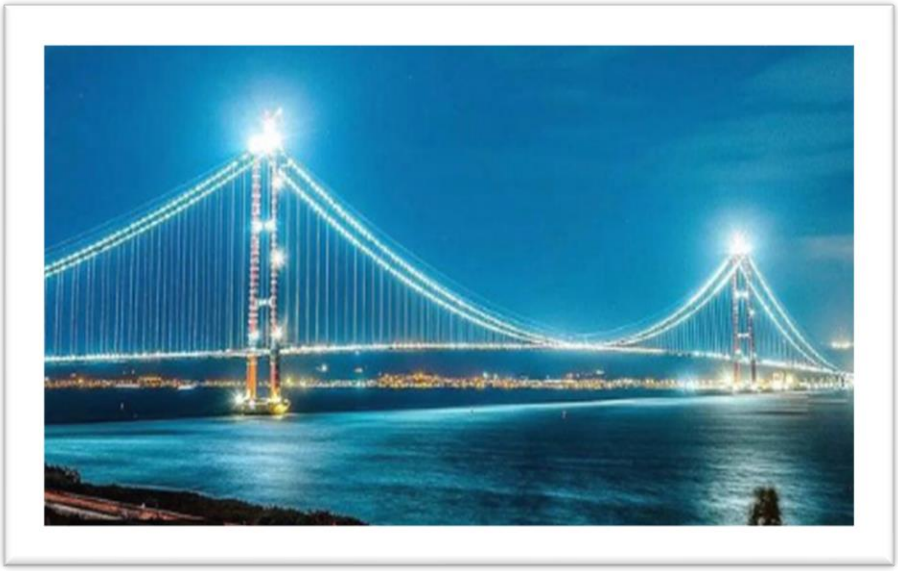

Photo 4: 1915 Çanakkale Bridge Current Situation
(https://www.instagram.com/p/CVtGUy3I50S/?utm_medium=share_sheet)

Photo 5: Bandırma port (https://dargeb.com/celebi-bandirma-limani/)

Photo 6: Biga İÇDAŞ Steel Energy and Shipyard Factory (https://www.youtube.com/watch?v=F4KAtbB1YgE)