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CITY PROFILE: BOLU

İsmail TANER*

KENT PROFİLİ: BOLU

Öz

Türkiye genelinde ortaya çıkan düzensiz kentleşme olgusu, benzer biçimde Bolu'da da tarihsel- kültürel fiziksel yapı süreç içinde yok edilerek karışık yaşam alanları kente egemen olmuştur. Kentin fiziksel yapısındaki değişim 1940'lı yıllarda başlamıştır. O yıllarda meydana gelen deprem sonucu hasara uğrayan yapılarla birlikte eski yapılar tarihe ve kültüre sahip çıkılmayarak yıkılmıştır. Yapılar onarılarak yeniden kullanıma ve görsel duruma yönelik düzenlenmiş olsaydı kentin özellikle merkezi daha çekici olabilirdi. Kentin fiziksel formu, çevreleyen doğal yapının gerisinde kalmakta; kent içi imar düzeninde olumsuzluklar özellikle sosyal donanım alanlarında yetersizlikleri bulunmaktadır. Bolu kentinin yer aldığı alan; aktif deprem kuşağı üzerinde olup oturmamış ve yerleşmemiştir. Tektonik bakımdan hareketli olan bu bölge, kentsel alanları da etkisi altına almıştır. "Kuzey Anadolu Fayı" nın varlığı ile şekillenen jeolojik yapı, Bolu kentini birinci derecede riskli bir deprem bölgesi durumuna getirmiştir. Deprem bölgesinde olması kentteki yapılaşmayı etkilemektedir. 1999 Depremi sonrası yapılaşmanın bir süre duraksama geçirdiği, daha sonra canlanmaya başladığı ve deprem sonrası inşa edilen konutlar bölgesinin model oluşturması yönünden kentte olumlu etkisi olduğu belirtilmektedir.1999 Depremi sonrası ortaya çıkan yeni yerleşmeler dışındaki konut alanlarında, özellikle merkeze yakın bazı mahalleler, kendi haline bırakılmış köhneleşmiş yapılar ve yetersiz altyapıyla yaşanılabilir durumda değildir. Özellikle Kentin kurucu ve eski mahalleleri olan bu yerleşmelerde, yapılaşma ekonomik durumla ilişkili olarak, başlangıçta gelişmenin doğru şekilde olmadığı, konut alanlarının arsaları küçük tutulmuş ve düzgün bir yapılaşma ortaya çıkmamıştır. Özellikle ilin köylerinden gelenlerin yerleştiği bu alanlarda oturanların, sosyo-ekonomik ve kültürel düzeyleri düşük olması nedeniyle gelişmemiş mahallelerdir. Bu yerleşmelerde, yeni bir imar planı düzeni içinde kentsel dönüşümün yapılması kaçınılmaz olarak görülmektedir.

Anahtar Kelimeler: Kuzey Anadolu Fay Hattı, Bolu depremselliği, kent profili, mekansal gelişim, turizm.

* Assist. Prof.., Abant Izzet Baysal University, Faculty of Engineering and Architecture, Department of City and Regional Planning, Turkey, e-mail: taner_i@ibu.edu.tr

Abstract

In the face of unplanned urbanization emerging throughout Turkey, historical-cultural physical structure has also been demolished in Bolu and complicated residential areas predominated the city. The change in the physical structure of the city started in the 1940s. Old buildings and buildings damaged as a result of the earthquake that happened in the 1940 were demolished without protecting the history and culture. Especially the city center could be more attractive if the buildings had been repaired and rearranged for use with aesthetic concerns. Physical form of the city falls behind the natural structure surrounding it and the city center suffers from problems in the zoning order and from insufficiencies especially in terms of social reinforcement areas. The area where the city of Bolu is located is on the seismic belt and not settled yet. This area, which is tectonically active, influences the urban areas. The geological structure shaped with the existence of "Northern Anatolia Fault Line" turned the city of Bolu into a first degree seismic zone. The fact that the city is in the earthquake zone affects the housing in the city. It is stated that housing paused for a time after the earthquake of 1999, and resumed after a while and the residential area built after the earthquake had a positive effect on the city by setting an example. Some old residential areas especially the ones close to the city center (excluding the new settlements emerged after the earthquake of 1999) are not in a livable situation with buildings that were abandoned and slummed and with insufficient infrastructure. Especially in these neighborhoods, which are among the founding and old neighborhoods of the city housing, housing did not develop in the right way at the beginning in line with inadequate economic condition, the plots of the residence area were kept small and an inaccurate housing occurred. The neighborhoods, which are settled by peasants from villages affiliated to the province, are underdeveloped because their residents have low socio-economic and cultural levels. It seems inevitable to implement urban transformation within a new master plan for these settlements.

Keywords: Northern Anatolia Fault, seismicity of Bolu, city profile, spatial development, tourism.

1. Introduction

Bolu is a significant linking city located on the transportation system connecting the Marmara Region, the area that is socio-economically the most developed part of Turkey, and other parts of Anatolia. Bolu is a busy transit area for commodities and passengers due to being midway on the transportation network that connects Istanbul and Ankara, the largest and second largest city in Turkey respectively. Although Bolu has rich forests and natural tourism areas, its population and economy have not developed enough to date. In prospective years, it is expected that this city will attain

a significant position in terms of recreational tourism due to its natural beauties which are accessible to big cities. On a provincial scale, Bolu has natural beauties thanks to the characteristics of the geographical area in which it is located. Since the city cannot provide its residents with ample economic opportunities, it is not very appealing for immigrants from other cities. Internal migratory flow from counties and villages within the borders of the Bolu to the city centre has been going on. Bolu was seriously affected by earthquakes that caused significant damage, destruction and loss of lives in the northwest Turkey in 1999. Furthermore, since one of the counties of Bolu (Düzce) politically acquired the status of a city after these earthquakes, some counties, towns and villages joined it. Therefore, various changes occurred in the demographic, economic and social structure of the city, and the population of the province substantially decreased. Though the province has not received migration from outside its borders, a significant portion of the civic structuring progressed outside the whole "Master Plan for Bolu". In the present study, the city's profile will be identified by examining the city in terms of its historical and physical development besides geographical, sociological, planning and environmental aspects and identifying the characteristics of the urban development of the city, its dimensions and direction of the development.

2. Methodology

Bolu's City Profile was prepared based on the study titled "Factors Determining the Spatial Development of the City of Bolu". This study was conducted within the scope of Scientific Study Projects supported by Abant İzzet Baysal University in the city. "Field study" technique was used in the study. To collect data, surveys at residences and interviews with the informants (notable people of the city) throughout Bolu were carried out to include different urban functions. Inventory taking and observational data collection techniques were used. Data regarding the qualitative and quantitative features of the settlements were collected from a chosen sample on predetermined topics. The study was conducted according to discovery and description types. Later on, data was transcribed and interpreted by using statistical technique. Suggested hypotheses were tested with the data that was obtained. Based on the data and findings of the study, factors determining the spatial development of the city of Bolu were presented. The profile of the city was determined by making some deductions based on data.

It is necessary to define new urban criteria in order to plan Turkey's cities more effectively in the future periods. For example, concepts such as **sustainability, livability and quality of life** should be used in the definition of urban profiles. In addition to socio-economic and physical criteria, data can be collected to determine especially the quality of life by interviewing people living in the city center and regulations can be made on planning by developing these data. Sustainable development is defined as the way of development covering the developmental needs of today without reducing the development needs of the next generations. The public's quality of life depends on spatial and physical qualities of the cities as well as other social and economic factors. Plans and aesthetic qualities, land use types, population and building density of cities and the ease of access to sufficient public services in these cities have important effects on the livability of a residential area. To this end, city profiles indicating the spatial and physical qualities of the city in a descriptive manner could be used (Habitat II, 1996).

Although this study looks like a descriptive study, the criteria / measurements used in the description are different and modern. The study conducted in accordance with both discovery and description types. In this sense, it can contribute to creating solutions by activating current potential situations, solving or reducing current problems and insufficiencies and to the planning of the whole city (at every scale). It is necessary to make this city, which is left in the middle of first two big cities of the country at an equal distance to each and which is under their pressure, gain a new identity. Contributions can be made to Bolu city profile for the planning approaches to be used for this purpose. It can be considered as providing a basis for the analyses works that are done.

3. Research Question

Today, the urbanization process caused by migration from the rural areas to the cities in Turkey especially after 1950 is still going on. This process is assumed to continue until the population ratio of the rural areas to urban areas will be 30 / 70 and the percentage of people dealing with agriculture in the rural areas will be 5 percent. Unequal and unbalanced development process which forms the structure of the rapid development that was experienced increased especially the population of the large cities. Borders of the settlement areas expanded as far as possible, they differed and became diversified with their physical, economical, social and cultural structures.

As in many developing countries, urbanization process in Turkey gained speed with disintegration of the peasantry and their breaking away from the rural areas over the last sixty years. Cities in Turkey grew like an oil stain until the mid 1970s. In line with the qualities of the building forms during this period, the development of the cities occurred largely with buildings uniting with each other. This causes demolish and build process to be employed in the city centers as a result of which cultural and historical values are damaged, density increases continuously, green areas are destroyed and social infrastructures become insufficient. Growing manner of the city continuously bears results reducing the quality of life (Habitat II, 1996). Earthquakes that occurred in Bolu in 1940 and 1999 have played a determining role in the changes that occurred in the form of the city. In addition to damaged structure, other structures were also demolished in the earthquake of 1940; historical and cultural values started to be destroyed. Housing developed intensely especially in the city center and in a haphazard manner with the zoning plans changing during different periods. After the earthquake of 1999, haphazard settlements in the form of earthquake buildings and community buildings, which were more neatly planned, were added in addition to already haphazard settlements.

4. Works Made for the City of Bolu

Bolu Province Tourism Master Plan is the study by Özcan R. Kırcalı, Ankara 1990 aimed to develop ideas and suggestions to prospectively assess various natural, historical and cultural resources within the borders of the province. While prospective decisions were made during the planning works, it was also ensured not to use it in a way to harm the natural-historical-cultural environment, in other words, a balance between preservation and usage was achieved. In the assessments part of the plan, which included the tourism potential, current status and prospective development of Bolu Province, it is stated that the tourism should be discussed as a part of the socio-economic life in the city rather than as a topic on its own.

It is maintained in another study (**the Study about Bolu Province's Socio-economic Development Perspective)** that tourism is the only sector open for development by underlining the insufficiency of Bolu's development until the present day. As a result of the study it was determined that tourism as one of the prospective developing sectors is the most popular sector on which hopes are pinned.

A **Soil Investigation Study** was made in cooperation with Ankara University, TÜBİTAK and Bolu Municipality by means of TÜBİTAK (The Scientific and Technological Research Council of Turkey) after the earthquake of 1999 and land use map was prepared. It was determined in the study that a large part of city's soil is not earthquake proof, there was a high risk of liquefying and streams pass under two thirds of current concrete buildings. For this reason, story height limitation was applied to land use map and three-story buildings were adopted with the normal classic building system.

Bolu Provincial Development Plan: a sustainable "provincial development strategy" effectively supported by public and the mobilization of the local sources were required in order to create more added value to the economy of the province. Bolu Province Development Plan was developed by Abant Izzet Baysal University within this framework. It was aimed to arrange spatial distribution and create a provincial inventory to determine and use provincial resources, to use the potentials and to ensure the development of the province. The problems of the province and relevant solution suggestions were discussed.

In Bolu Province Report (G. Erşahin, İ. Şerifeken, Publication No. DPT :2651., State Planning Organization, Ankara, 2002) spatial structure, administrative structure and socio-economic status of the province, public and private sector incentives were examined in line with currently available data and the problems of the province and the solution suggestions were discussed.

5. Overall Approach

The physical structure and form of the city are shaped by the reflection of the socio-economic qualities of its residents on the living space. Income level, educational background, gender roles, adopted lifestyles, religious, ethnic and other socio-economic and cultural properties of various groups in the society are reflected in also similarities. Various socio-economic and socio-cultural groups choose places in the physical space of the city within possibility. The resultant structure that is the outcome of change in physical structure is apparent at two levels: a. Physical and geographical structure b. Socio-economic and cultural structure. Urban areas are shaped in the form of cells by districts or communities. Generally, people's lives are centred on the production and consumption of commodities. The dynamism of various changes in the environment that constitute the civic form causes the phenomenon of urbanization to emerge. The physical

structure of the city is shaped by economic, social and political powers of it. The city houses similar or different, social, economic and political characteristics in various patterns (Katznelson, 1992). Qualitative conflicts of different income groups makes itself clear on the physical environment. Rather than being a passive area, the civic environment is seen as an active component that is influential in the formation and production of the whole structure. The constitution of urban form emerges within an ongoing (sustainable) process. The composition of the "urban form" is also shaped by the needs and capacities of civic transportation infrastructure entailed by growth due to the mobility of population. Urbanization in Turkey has multi-dimensionally affected the urban environment, economic and social life and helped unearth various lifestyles in the physical civic structure by accelerating transformation. (Keleş, 1996).

In the 1950s, due to the introduction of initially thousands of and later hundreds of thousands of tractors and other agricultural vehicles into agricultural production, a rapid urbanization process began through the flow of population into urban areas. Urbanization followed an irreversible process of structural changes due to people's being workers depending on salaries, the emergence of a new order of business and employment, alteration in the family structure. This process spread in waves, significantly changing the relations, institutions, values and thoughts of the old system from bottom to top. This development that occurred in Turkey as a late industrialized country in the second half of the last century came into being since 20 million villagers, who separated from their land due to difficulties, migrated to urban centres in 30 years. Turkey basically entered a process of change in the mid-1950s with the help of agricultural product surpluses. Gradually, this served to reach industrialization which is based on a non-agricultural structure (Kıray, 1998). The economic, social and cultural policies that the public (the state) created have played a significant role in shaping the physical environment of civic centres since the beginning of the Republic (1923). However, the state's diverting its attention to industrialization without allocating economic resources to urbanization transformed civic centres into areas of economic gain within a spontaneous development process, particularly after 1950 when cities were left to their fate. In the historical period, there have been some changes in the structure of urbanization in line with the phases that the system has gone through. What is intended by changing policies was the desire to incorporate the economic relations that shaped civic environments into the framework of the system (Çezik, 1982). Housing needs during urbanization have been shaped by people

coming from rural areas who built squatter houses, and by small investors that are referred to as "build-and-sell" constructors who constructed buildings (multi-storey houses) according to the master plan. The former built visually displeasing (squatting) houses without infrastructure, social facilities to solve their own housing problem, and so haphazard urban development areas have emerged. On the other hand, though the activities of the latter are on a legal basis, the main purpose has been getting unearned income. The settlement areas that emerged suffered from dense housing and inadequate technical infrastructure and social facilities (Tekeli, 1996).

The style of interfering with urbanization with the policies that were put into practice after 1980 is this: The influence of large capital holders as organized groups (private sector) has increases, particularly by allocating more resources for housing development. Policies have been developed and new regulations are passed so that these groups get their share in urban incomes. When the challenges of the phenomenon of urbanization that has been developing at an alarming rate for the last 50 years besides rapid and unplanned development are considered, the proportion of rural / urban population, which was 70% / 30% has been totally reversed today since urban population has reached 70% according to census data in 2012. The population of Bolu reached 138,000 in 2012. According to census data from 1927 to 2012, rapid population increase that has been apparent since the 1950s has been slower in Bolu. That is, though the national population increased four folds, this increase was 2.5 in Bolu.

Figure 1. Geographic Location- Bolu; between Ankara and Istanbul

5.1. Geographical Location of Bolu in the Country and its Significance

Bolu is midway between and close to the two metropolitan cities with a dense population in Turkey. The potentials of a number of significant natural beauties have not been adequately utilized in terms of tourism. The city seemed like a small town, but after the foundation of a university in 1992, it began to get rid of its closed structure in which exists. Bolu, as a city of recreational activities, can offer the characteristics of a tranquil life. It has a homogeneous population structure since it has received little migration. According to the results of a research study carried out in 2010 and 2011 by a magazine, Bolu ranked the 7th out of 81 cities as a "habitable city" * (CNBC Business Magazine, 2011). Although

* “Research on quality of life in 81 Cities, 2011" was published in Issue 59 of the magazine, in September, 2011. It is stated that this study was carried out considering 37 criteria under the headings of economy, education, health, urban life, security, culture and art.

the city is adjacent to metropolitan cities, its nature hasn't been damaged to a large extent. The city is small and orderly with similar properties throughout its districts and boasts lovely characteristics. However, it has to tackle with some problems due to inadequate physical infrastructure. With its 1.5 hour distance to Ankara and 2.5 hours of distance to Istanbul, the city is accessible to one-thirds of the total population of Turkey. The surroundings of the city have an unprecedented structure in terms of their natural beauty. National parks and picnic areas within the borders of the city are at a distance of 10 to 50 kilometres. These destinations that are areas with significant natural characteristics include Gölcük, Abant, Yedigöller and Aladağlar and so on. With its natural environment and recreational opportunities, habitability of the city comes to the fore in comparison with its counterparts.

Physical housing in the city, particularly the city centre is not regular enough except for new developmental areas. In the past, unplanned urbanization patterns that were seen all over Turkey led to the emergence of disorganized living space in Bolu as well. Changes in the physical structure of the city began in the 1940s. In those times, after a major earthquake, historical buildings, along with damaged structures were pulled down without protecting historical and cultural values. If the damage buildings had been repaired and presented for use again with their visual properties, the city might have acquired more attractive characteristics. Today, along with its problems such as heavy traffic (lack

of enough parking lots, particularly in the city centre), air and environmental pollution, the city has to face inadequate economic development. Incongruous buildings and dissimilar districts have emerged due to additions to old structures through disorganized housing practices. Bolu is inadequate in terms of its civic functions; though it is surrounded by forests, open spaces and social facilities in the city are highly limited.

5.2. Physical Characteristics

The province of Bolu is located along D100 highway that connects Istanbul to Ankara, being at a distance of 262 kilometres from the former and 191 kilometres from the latter. In close proximity to the highway in the north, Trans-European Motorways, TEM for short, passes through Bolu. The city has no connection with railways or sea routes. There is an airport intended for the military that is not open to civil transportation. As an urban area, Bolu has grown around the highway that is in east-west direction. Therefore, the city is divided into the north and south sections. D100 highway is intensely used in intracity transportation as well. As a province, Bolu is located in northwest of Anatolian peninsula and on the tip of the Black Sea region in the west. The square measure of this province is 8556 km^2. The square measure of Bolu city centre is 2607 km^2. The square measure of the province equals to 1.4% of Turkey's surface area. The province of Bolu opens up to the Black Sea Region in the northwest and the Middle Anatolia Region in the south, establishing links between these two regions. Bolu is located on a rugged and mountainous terrain between the Black Sea and Middle Anatolia Regions. The mountainous area that developed by rising from north to south and from west to east covers 61% of the province (Yurt Encyclopaedia, 1982). The peak of these volcanic mountains is Mount Köroğlu (2499 m). Forest land covers 55% of all land in Bolu, making Bolu boast a higher forest rate than the mean forest area in Turkey. Within the borders of the province, tectonic subsidence valley of Düzce - Bolu - Yeniçağa - Gerede exhibits the characteristics of first-degree seismic zone, in which active faults stretch out. This subsidence area which is highly active is the largest seismic belt in Turkey as well (Bolu Yearbook, 1967;1968). This platform shapes Bolu plain, and its altitude above sea level is 725 meters. Bolu is located on this area . With its length of about 32 km in northeast-southwest and 15 km in northwest-southeast, this rectangular area is approximately 460 square kilometres. The Bolu plain, southern part of which is surrounded by Northern Anatolia fault, has been filled with highly thick silt. The mountain slope in southern Bolu is relatively steep

due to the impact of the seismic fault. The climate of Bolu is harsh and the land is not very fertile. To the north of the plain are the Bolu mountains that rise up to a height of 2000 meters, while to the south are the Köroğlu Mountains (Yurt Encyclopaedia, 1982).The province of Bolu has the properties of continental climate that is referred to as "Climate beyond the Black Sea." Its climate is highly cold bearing the features of continental climate. In general, summers are cool; winters are cold, and precipitation is seen in every season. The mean annual temperature of Bolu plain is around 10 Celsius degrees and the number of frosty days in a year reaches up to 100. While the annual mean precipitation in western side of Bolu Mountain is 1200 millimetres, it is 538 millimetres in the city centre. The prevailing wind in Bolu is westwards and south-westwards. The winds which are more prevalent in spring, autumn and winter months ease off in summer months. The mean temperature of the last 60 years is 10.2 Celsius degrees. Harsh climatic conditions in Bolu result in increased costs of heat insulation and labour. Bolu is rich in dams that come in various sizes. The highlands in the region are areas reserved for husbandry, tourism and recreation. Though the province has a rich river system, annual water reserves are low due to irregular precipitation in the basins of the rivers.

5.3. Seismicity of Bolu and Its Immediate Vicinity

Turkey is located in one of the most active earthquake-prone zones of the world. When the overall country is examined, it is seen that there is an active fault line of 24500 kilometres, 15000 kilometres of it being on the main line. 98% of the total population lives in an area of high seismic risk. 130 destructive earthquakes that have occurred since 1903 have claimed the lives of 100.000 people and destroyed 2 million houses. All current topography of settlement and development areas of Bolu possess soil that is composed of silt. This structure is highly dense in the north of the province, but as you go to the south it gets loose and underground water level is closer to the surface. The city is located on an active earthquake zone. The settlement areas are generally located on loose ground. The tectonically active area has influenced urban areas as well. The geological structure that has turned into "Northern Anatolia Fault" has rendered the settlement areas in the city first-degree seismic zone of high risk. To date, the city has witnessed a number of earthquakes that were barely, slightly or highly destructive. In the earthquake 1944, most buildings in the city were damaged. The earthquake that is equivalent to the size of 8 in 17th August, 1999 caused serious damage in Northwest Anatolia and its aftershocks continued for six months. It was Düzce, its surroundings and

Bolu that were mostly affected by the second destructive earthquake that occurred on 12th December, 1999, with its epicentre in Düzce, which is 55 kilometres to the west from Bolu. As it is the case in other cities located on seismic zones, Bolu experiences problems with land use and architectural practices due to unplanned and disorganized urbanization. Since Bolu is located in a first-degree seismic zone, the construction of buildings according to the codes in practice in seismic zones was made obligatory through the decisions made after the major earthquakes in 1999 (Abraseys, Finkel, 2006). It is stressed in geological reports that it is necessary to avoid areas with soft ground and hinder the development of the city towards the south in order to be safe from the destructive impact of the fault line, which passes through southern parts of the settlements and which was learned to be highly active after the last two earthquakes.

After the earthquakes (1944 and 1999), it was an obvious fact that there is a fault line passing through an area that is 4 km from the city centre. This proves to be a key factor in ongoing struggles to organize the current and prospective physical environment of the city. New construction standards were taken into consideration to reach a certain level in the selection of location for the temporary and permanent earthquake houses built in the west after the earthquake, planning and practice of the infrastructure and superstructure. However, due to limited economic resources and inadequate organizations, these conditions were disregarded as the time passed reducing the impact of the earthquake. For example, the limitation of three-storeys that was imposed after the earthquake of 1999 soon turned into a limitation of 5-6 storeys which was practised before the earthquake. We can hardly say that preventive measures that will minimize the impacts of a possible earthquake in the future have been taken. Since the city often experiences earthquakes, static strength in buildings have been stressed. However, it is clear that dense housing that is not compatible with the master plan is common. Being in a seismic belt and located on a seismic fault line have negatively affected the development of the city. Ground studies in the lands made after the 1999 earthquake revealed that the areas to the north and the west the ground is more solid. For this reason residential development leaned that way. The western part of Bolu was less affected by the earthquake. This area is preferred in terms housing development since it is outside fertile agricultural lands. It is stated that avoiding the areas with loose soil and preventing the city from developing through the south is geologically appropriate and necessary in order to not to be strongly affected by the fault line which is known to be very active and which passes from the south of the city.

5.4. History of Bolu

Throughout history, the oldest human settlements of Anatolia have existed in the area where Bolu is located. These residential areas are Bithynium, Claudiopolis and Hadrianopolis. The city was brought under the rule of Hittite, Phrygian and Lydian kingdoms and Persian, Macedonian, and the Roman Empires. Turks overtook the city at the end of the eleventh century, but after the First Crusade, the city came under the rule of Byzantium. Later it was annexed by the Ottoman Empire. In Bolu and its surroundings, there are lots of historical artefacts inherited from Hittite, Phrygian, Roman, Byzantine and early Ottoman periods (Eyice, 1975). In the excavations carried out in the city centre, the theatre, necropolis and temple of the ancient city were partially unearthed. The city center of Bolu, the roots of which can be traced back to approximately 8 thousand years, is established on three hills. The current city has been condensed around the local administrative building that is located further in the west. The buildings located in the center bear the traces of the Ottoman period. However, these historical structures are lost forever due to unplanned urbanization. The city experiences some problems posed by dense housing due to the lack of more than one center. The city was previously developed around the historical center, and later this development progressed towards the north and west due to the university campus, the post-earthquake houses built and housing development projects in the west.

Figure 2. Bolu in 1940's: Today these Ottoman Turkish houses are disappeared. The white building is old municipality. Source; archive of Semih Dimicioğlu

5.5. Development of the Physical Structure of the City

Considering the current and previous aerial photographs, the physical development of Bolu can be summarised in seven stages (Turkish General Command Archive of Maps):

1. Until 1944

İzzet Baysal Avenue and some sections of İhsaniye and Bahçelievler Districts in the downtown developed. B. Cami, Gölyüzü, Aktaş and Akpınar Districts, which are referred to as the founding districts of the city were built.

Figure 3. Changing of Urban form of the same place from 1940's to 2014, Source; archive of Semih Dimicioğlu and author

2. Between 1944 and 1955

Until 1955, the city has not developed in the north towards D-100 (Ankara-Istanbul) highway. Transit Ankara-Istanbul highway goes through the city. In the north of the city, a small scale industrial site was established along D-100 highway. In line with this, housing development is seen in Köroğlu and Çıkınlar Districts. In the north, some portions of Sağlık and Beşkavaklar Districts near D-100 highway developed. It is observed that Tepecik and Borazanlar Districts and Paşaköy located in the southwest of the city were developing. In the east, Köroğlu District considerably developed in line with the small industrial zone in the area. Today, there is no development in the direction of Karacasu, 4 kilometres towards in the south; there is development only in lower boundary of Karaçayır District, in the area where some sports facilities are located.

Figure 4. Aerial shot, Bolu 2010, Source: Google Earth

Figure 5. Existing and Devlepment Areas

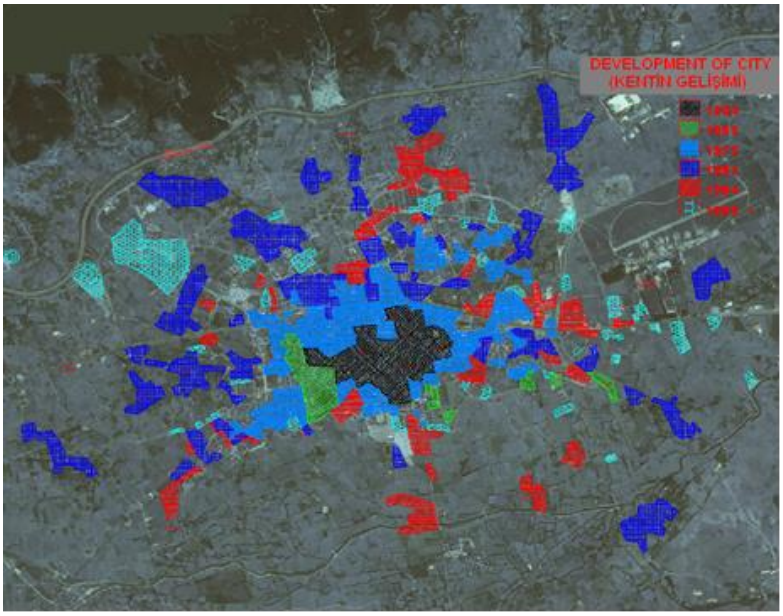

Figure 6. The Evolution of Bolu urban form: 1944-2010. source; author

3. Between 1975 and 1983

We see that urban development was completed in the city centre, and the villages like Paşaköy, Sandallar, Kasaplar and Seyitafşar, which are close to the settlements along D-100 highway in the west, turned into districts of the city. A small section of Karacasu in the south and various rural areas such as Dadıç, Örencik and Karaağaç developed. The north substantially developed; Kültür District and the villages along the water-channel; that is, Sarıcalar, Dodurga, Çakmaklar and Salıbeyler developed.

4. During 1994

There were developments in all directions around the city. Developments were observed in South Karacasu Çançabel village, "500 Evler Sitesi" in the east, Çıkınlar District, the area located on the north side of D-100 highway, Kuruçay District and in eastern side of Small Industrial Area. In addition, constructions with shared ownership along the water-trench in Sağlık District emerged. In Beşkavaklar and Kültür Districts, it is possible to see developments in leapfrog housing areas.

5. Until 1995

There are developments in physical structure in such districts as Tepecik, Aktas and Karaçayır in the south; Sağlık in the north and Kuruçay in the east. However, there were no developments between 1983 and 1994; permanent earthquake houses were built after the major earthquake of 1999 (Yaşamkent and Umutkent Districts), (between 1983-1994). Because there is rapid urbanization in Bolu, this area began to develop, and this development accelerated beginning with the 1980s. Small businesses and organized industrial area played a significant role in this. After the foundation of a university in 1992, this development became apparent. In this period, development accelerated, particularly towards the north and west. The reason for why fast housing development in eastern side of the city is that small industrial zone, F-Type Prison and Military Areas emerged as a threshold. Since there are large areas that hinder housing development, there haven't been leapfrog development towards this way. The city has not developed southwards since this area is agricultural land. In this region, housing is not allowed by "Land Protection Committee". Because there is a development plan until the highway in northern city, there have been developments in that particular direction. Another reason for why there is no development towards the south is that the "Northern Anatolia Fault Zone," which emerged after the major earthquake of 1999, passes through this area. The existence of construction restriction of two storeys makes the area less appealing.

However, those people who want to build detached houses prefer the area. Since buildings with up to five storeys are allowed in the north and west part of the city, these areas are preferred by those interested in build-and-sell, and the area is getting more active. In the north, supporting industry has developed around Arçelik, which is a large-scale industrial investment. Except for the development of a few small-scale factories, housing has not developed in the area. There is no illegal housing in this area.

6. After the Major Earthquake of 1999

After major earthquakes that occurred in 1999, the settlement structure of the city was challenged. Ground conditions were investigated by a university (Ankara University) and residential areas were classified. Such labels as "appropriate area", "inappropriate area," "important area" were given to land. However, later inappropriate areas were zoned for housing as well. The areas sloping towards the north have been considered appropriate for housing development. Authorities stated that precautions must be taken to prevent housing progress towards the south. After this rating, available plans continued to be used without any master plan revisions. Following the earthquake, a limit of three storeys was imposed on new housing in the city centre. However, this restriction was soon lifted and previous housing conditions were in practice again. In order to avoid visual pollution around permanent earthquake houses, a limitation of three storeys was imposed only in this area. It is stated that due to fear of earthquakes, the idea of constructing strong buildings dominates in Bolu, yet people are also accustomed to not complying with architectural codes. For instance, it is stated that housing density coefficient was violated. There is a tendency to construct buildings through undesirable attempts to increase the value of plots such as disregarding the restrictions imposed by master plans, not complying with the rules regulati Dağkent District as a satellite settlement area emerged in the west of the city along D-100 highway. It was included in the municipal adjacent area in 1994 and later it became a district in the city. Its not being appealing for constructors since it is away from the civic centre can account for not being able to complete the construction process in this area. After the major earthquake in 1999, housing gained momentum since the ground in the area is safe.ng the number of storeys and pull-distance and trying to gain larger areas and more flats on a plot.

Figure 7. ”Seismic Houses” constructed by government after 1999’s Earthquake; sample of regular costructing, source; author

Because multi-storey buildings are avoided due to earthquakes, the area has been preferred for building detached houses. Since Akpınar, one of first districts in the city centre, is a first-degree protected area, available buildings are protected and the construction of new buildings is not allowed. This area is not preferred by constructors who are interested in build-and-sell and is not considered to be a profitable business due to joint ownership and small plots. Since it is an old housing area, there is a certain level of dense housing. Besides this, lower levels of social and cultural life cause people to abstain from preferring it. Residential areas located in the recently developing northern side of the city are preferred. There is no substantial renewal in the first (founding) districts that possess the historical characteristics of the city. Some buildings in some districts are being changed and new buildings are often multi-storey structures. The areas around the highway to the north are regions where people coming from surrounding villages prefer to settle down. While these villages try to maintain their rural characteristics, there are new housing activities that occur due to urbanization. However, there are buildings with characteristics of shanty houses around the city and suburbs. As for villages in the second circle further away from the city centre, they maintain their rural characteristics. In recent years, some of community mass housing projects have been carried out in this area. According the map of land use and potential development of the city, it is stressed that agricultural and forest areas should be protected and not be used for unintended purposes. Being located in a basin surrounded by mountains,

the city can house a certain population. The current population of the city is about to reach 140000. It is stated that the available development area of the city can house a population of up to 300.000, and further population increase through migration will worsen the problems that already exist in the civic structure.

5.6. Current Structural Patterns and Environmental Conditions

In Bolu, which was referred to as a "forest sea," wood was commonly used in old buildings as a natural construction material. Very few wooden buildings that had been built until the early 20th century have reached today. In the "old city" section, there are samples of old civil architecture, but the number of such buildings is gradually decreasing. These constructions are bright houses with large, wooden doors and spacious rooms. Today they are being replaced by multi-storey buildings. It is observed that disorganized and irregular physical development in Bolu dominates the environmental structure. As a result of migration from rural areas to cities, the phenomenon of squatting (illegal and disorderly housing) is observed. On the other hand, disorganized settlement areas have emerged on shared land around housing areas.

Figure 8. Old Turkish house between irregular new buildings in one of center neighbourhood, source; author

To legalize illegally built structures, a number of "amnesty" laws have been passed in Turkey in various periods. This has encouraged disorganized housing development. Based on the "amnesty law" that was

in practice between 1984 and1986 for the last time, to incorporate disorganised housing into the master plan, "master plan revisions" were made and these areas were incorporated into the master plan (scaled 1/5000) (Bolu Master Plan, 1992). Disorganized housing areas in the city: Dense housing areas have been created by constructing buildings with different heights on adjacent plots with shared ownership and with street organization determined by estate agents without complying with the principles and standards of civic planning on land. Around some districts are constructions built by cooperative building societies. Though a certain level of order is seen in such buildings, some problems have emerged such as inadequate green spaces and social facilities besides visual pollution. In old districts that are located in the city centre, the size of plots of land is inadequate. In these parcels of land, buildings that deviate from historical values and patterns emerge since the number of storeys is on increase. No judicial, economic and administrative precautions have been taken to protect the historical and physical fabric of the city. The overall city which is not totally included in the master plan has been experiencing a distant and isolated housing development since it is dispersed on a large area. This in turn leads to challenges in the development of civic infrastructure and superstructure. Permissions for construction demands in the areas which are not zoned for construction are given when the plot land is connected through a cadastral method. Such practices encourage disorganized housing.

Earthquake housing areas that were created by the public after the 1999 earthquake and recent housing developments practices have led to the emergence of leapfrog (suburban) housing areas. The common characteristic of these areas is that the land is public property. However in such housing practices, there are visual patterns that are in conflict with the properties of the landscape of current natural structure. Moreover, it is stated that these houses were built without considering housing needs, and therefore there is an excess of houses. As a result of the geophysical research carried out after the earthquake in 1999, it was found that the areas with a strong ground are located in the west and northwest of the city. In new constructions in this area regular settlement patterns have emerged. Housing development in the city has progressed towards northwest and west directions. After the investigation of ground conditions of the areas located in the north and west of the city, with the construction of "permanent earthquake houses" in line with the master plan prepared after the 1999 earthquake by the public, housing with regular streets and development areas emerged. The settlement area for the earthquake houses that were built after the earthquake in 1999 and the

area around them in the northwest side of the city centre have begun to turn into a "high-prestige housing area." Examples of orderly development have been seen with the new bus terminal and some other civic services (such as hospitals) in this area. After the major earthquake in 1999, a limitation of three storeys was imposed on buildings. However, this limitation was abolished later.

5.7. Development of the Master Plan and Land Use

The current master plan of the city was prepared in 1985. New housing areas that emerged outside this plan (in the west and north) are added to the master plan by preparing local master plans. This results in the emergence of irregular and deviant housing areas. The city has been developing towards the west for years, and in the forthcoming years, the sections until Abant turn out in the west and the highway in the north will tend to be constructed. Currently housing development has reached the forest boundary in the north. In southern part of the city, "Thermal Spa Tourism Area," located at a distance of 4 kilometres from the city centre, has a significant potential for development. However, the area is not appropriate for housing since the faults of the earthquakes in 1944 and 1999 (the Northern Anatolia fault line) appeared in the south. In this area, ground water is high, and there is first-degree irrigable agricultural land.

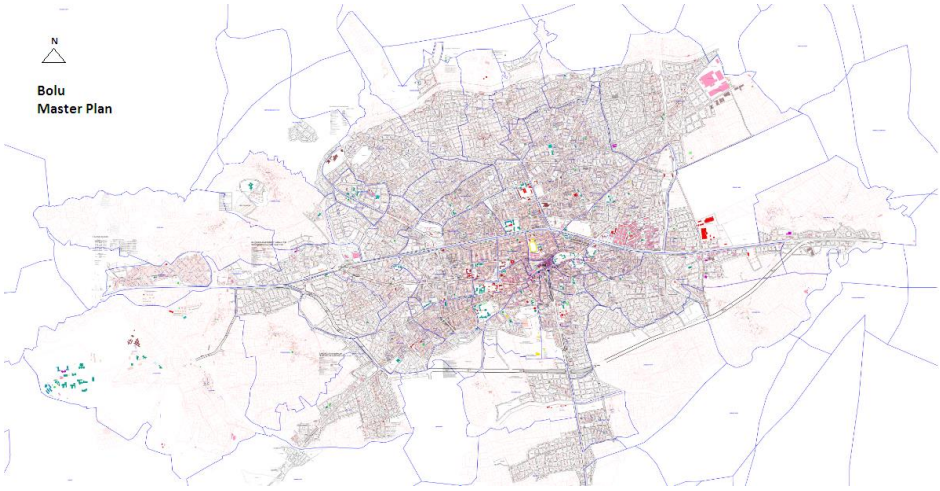

Figure 9. Master Plan of Bolu, source Municipality of Bolu

Urban development and enlargement: Enlargement patterns in the form of "oil stain" and leapfrog development have emerged due to the impact of changes and developments in transportation and communication systems. Urban development leads not only to the foundation of new districts through migration from rural areas, but also to dispersing of housing from centre to the suburbs of the city due to internal migration. It is observed that the villages located within the municipal adjacent area of the city and weekend houses (chalets) in the surrounding area tend to join the urban area. The city is being rebuilt; low-density and dispersed development (urbanization), which is common in its own right, is emerging. Although the population of Bolu is slightly increasing, it is turning into a city that spreads in a more sophisticated network of relations in a larger area that it covers. With the houses built after the earthquake in 1999 and recently built mass housing areas, the current settlement areas spread and satellite housing areas away from the centre have emerged towards the west between the highways. However, activities in the process of spreading have led to some problems in terms of local and central administration. This creates a pressure, particularly on fertile agricultural land, green areas to be protected (forest, fields and orchards, etc.) and water basins. All of these developments happen outside the current "Master Plan for Bolu".

Since large-scale industrial institutions, smaller industrial areas and organized industrial area are located in the east, this area is open to industrial development in the city. In this direction, there are also large-scale military zones. Karacasu, located in the skirts of a mountain at a 4-kilometer distance from the city in the south, has been declared as a “tourist zone.” There are spa centers and hotels in this area. In sum, there are housing areas in the west and north side of the city, industrial and military zones in the east and tourist areas in the south. The quality of housing development is compatible with the socio-economic and cultural make-up of the society. In line with the preferences of the social structure, the need for better quality houses arises as the economic level improves. The areas around the highway are regions where people coming from surrounding villages generally prefer to settle down. While these villages try to maintain their rural qualities and characteristics, new constructions have also emerged. As for the villages in the second circle that are further away from the city centre, they maintain their rural characteristics. The physical housing development in Bolu is as follows: Industry develops in the east, tourism in the south and west, and housing areas towards the north and west. It is expected that the university, at the west side of the city, will develop to reach 40.000 students in prospective years, making

the area a university town. The founding and historical districts that are close to the centre such as Semerkant, Aktaş, Akpınar, Karaçayır have been losing their significance, whereas such districts as Tabaklar and Bahçelievler have been developing. Being unable to zone the founding districts for construction and shared ownership of the land in such places, residents sell their houses and settle down in developing districts. Old districts have become an area of settlement for immigrants coming from the counties or other cities for employment. Those who come from the counties of Bolu and settle down in these districts bring the customs and traditions of their villages or regions with them.

Various master plan approaches that were put into practice in different periods have been reflected in the physical space. For example, buildings with different heights on the same street have emerged. In new buildings, there are architectural practices that come into conflict with adjacent structures. Organized construction in western city is not seen the east. In contrast to regular development in the west, there are ramshackle buildings that are left to their own fate in the east. The peripheral roads built by the municipality of the city in the south and east are not compatible with the standards. Particularly the peripheral road in the east side has provided little development in physical structure. Housing development areas tend to connect with the university, and they have reached the forest area in the north. In the directions where housing developed, an access road that connects the city centre with the university was constructed; housing development projects were initiated in the north and west, and new housing areas were planned in the north. There are two reasons for this development. First, the city naturally progresses towards the west. Secondly, there are new planning efforts because of the obligation to divert the city to these areas which have a stronger ground. On the other hand, a significant reason for why the city develops towards the north and west is that there are hindering (threshold) areas in the east; that is, the military zone, small industries, the prison, the area for organized industry, large-scale poultry production area, the cement industry and light industry sectors hinder housing development. In recent years, regular houses have been built in southwest part of the city by construction entrepreneurs. It is anticipated that similar housing development will continue in this area.

Figure 10. Housing developments constructed by government: Houses incompatible with natural structure, source author

It is a fact that "district identity" that has emerged due to mobility in Anatolian cities is more sophisticated than "urban identity." In Anatolian cities, a spatial continuity is observed in districts. Districts have their own identities, and urban environments possess a diverse composition formed by districts with different identities. There are various housing patterns in the districts that compose distinct spatial structure of the city. There is substantial renewal in the districts that bear historical characteristics of the city. Some districts are subject to change, and new buildings are generally multi-storey structures in such places.

Figure 11. Irregular buildings constructed in different times in Shoping Centre, source; author

5.8. Commercial Life

The notion of open market has a significant place in life in the city since Bolu functions as a commercial centre where 124 villages sell what they produce and buy the commodities that they need. The open market that is organized twice a week in the civic centre is also a social environment where shoppers meet and communicate. As a part of economic activities, locally organized peasant's markets come to the fore. In these markets, peasants coming from surrounding villages have the chance to sell what they produce. Bolu does not have a commercial economic structure. Commerce in the city has a uni-centred characteristic. Intense shopping and commercial activities are going on in the most significant street and a parallel one in the city centre. Economic, social and cultural development of Bolu has not reached a desirable level. Since the city is close to two metropolitan areas with ample transportation opportunities, a great majority of the population goes shopping in these large cities, so commercial life has not developed enough in the city (Master Plan,1992).

Figure 12. Things Producing and selling by villagers in tradional market area, source; author

Figure 13. Main Shoping District (İzzet Baysal Ave.); congestion of cars and pedestrians, source; author

5.9. Demographics: Population and Migration

The province ranks 62th among 81 provinces in terms of population size in Turkey. Population density of the province is 33 prs./km square, which is well below the mean national density of 83 prs./km square. Of the two factors that negatively affect the demographic structure of Bolu the first is earthquakes, and the other is changes in administrative structures. On a provincial scale, migration from rural areas to Bolu city centre has been continuing. The phenomenon of external migration in the province of Bolu cannot be seen because people coming from other cities are very few. On a provincial scale, internal migration occurs when people with limited agricultural and economic opportunities come to the city centre from rural areas (villages) in the counties and from mountainous regions to find a job. People are migrating to the areas near the city centre where they can commute to and from the counties and villages around the city. Other group of immigrants is seasonal workers that come to Bolu to work in construction and agricultural sectors, but actually Bolu does not have a condition to appeal immigrants outside the city. The population structure of the city experiences a natural increase. Since the villages that are close to the city centre joined to the municipal adjacent area, the population of the city increased and the urban structure has been enlarged in recent years. On a provincial basis, Bolu is among the cities of Turkey that emigrate. Rural areas in Bolu emigrate to both rural areas in Bolu and places outside this province. On the other hand, urban population emigrates to other provincial areas. On the contrary, small urban areas in Bolu province receive migration from rural areas. A certain portion of the urban population flows to the two close metropolitan cities. Though a great portion of people living in the villages that are highly close to the city centre have moved to the city centre, they still stay in their rural homes for short periods or at weekends. In villages that are adjacent to the city centre, life continues on end. In such villages, the requirements of rural life exactly continue. The spatial organization of the houses is as follows: the basement is used as a storeroom in which products from garden, fields or villages are stored; houses have a stable and haymow; they are located in a large area that is surrounded by high walls.

According to 2014 population data, the city of Bolu has a population of 140,850. the results of population censuses made between 1927 and 2014, rapid population increase emerging especially after 1950 in Turkey did not occur at the same rate in Bolu province, that is, it has been slower compared to the rest of the country. While the population of Turkey increased 4 times during these years, the population of Bolu increased

only 2.5 times. According to the results of the general population census in 2010, the population of the province was 270,654 people. The city center is the most crowded district in the city with its population of 135,009. 30% of the population of Bolu province consists of people living in the forest villages. 62% of Bolu province lives in villages. 77% of 809 villages are forest villages. 70% of the economically active population works in the agriculture sector while 7% of it works in the industrial sector. Migration from rural areas of province to the city center of Bolu continues.

Population Development (1970-2010)

Year	Turkey		Bolu Province	
	Rural Areas	Urban Areas	Rural Areas	Urban Area
1970	21914075	13691101	185798	53382
1975	23478651	16869068	187791	61045
1980	25091950	19645007	193244	69135
1985	23790701	26865757	160826	91658
1990	23146684	33326351	155368	107551
2000	23797653	44006274	127969	142685
2012	17178953	58448437	101246	169962

The urban population rate of Bolu's population is 62.67% according to the population census of 2012. Urban population rates throughout Turkey was determined as 77.28%, respectively. Urban population rates in Bolu province is lower than the general rate throughout Turkey.

Rates of Urban Population Compared to Total Population

Year	Turkey	Bolu Province (%)
1970	38.45	22.32
1975	41.81	24.53
1980	43.91	26.35
1985	53.04	36.30
1990	59.01	40.91
2000	64.90	52.72
2012	77.28	62. 67

Annual population increase in Bolu province during 1990-2000 period was 2.9 per thousand while the annual population increase in the city center and county towns was 28.26 per thousand and the annual population increase in the village was minus -19.4 per thousand (DİE, 2011). Turkey's rates, on the other hand were 18.3 and 3.9 per thousand, respectively. Bolu city had a very high rate of population increase during this period and the population which was 61,506 in 1990 rose to 84,565 in 2000. Annual population increase was 31.82 per thousand.

5.10. Tourism in Bolu

Since there are natural beauties in Bolu, tourism is prioritized and its power is felt. It is expected that these values are developed and presented for use. Thanks to the natural beauties in forests, Bolu is active in internal tourism. Most of the visitors to Bolu are higher income groups including daily backpackers or skiers that come in winter months. Because these visitors do not have relations with the city in terms of accommodation, they do not contribute to Bolu economically. Though winter tourism has come to the fore, other tourism sectors have not reached desirable levels. It boasts various tourist attractions such as forests, lakes, mountains, highlands, ski resorts, spa-health and opportunities for cultural tourism that have emerged as an alternative to sea tourism. Thanks to its proximity

to Ankara and Istanbul, the two metropolitan cities, and its accessibility from these cities in 1,5 and 2,5 hours respectively, Bolu is highly advantageous. On a provincial scale, Bolu is an area that provides the metropolitan areas; that is, Istanbul and Ankara, with recreational activities, particularly in summer months. As forest landscape, national parks and wildlife, there are nationally famous, spectacular areas at a distance of 10-50 kilometres from the city centre in the nature that appeal tourists. Among these are Yedigöller (Seven Lakes), Gölcük and Abant lakes picnic areas, Aladağlar camping and mountaineering areas, Kartalkaya ski resort and some highlands. On a provincial scale, Bolu has a 2% share of tourists who seek accommodation rather than visiting daily in Turkey. Tourist demand for Bolu occurs as a temporary accommodation for tours from Istanbul towards Cappadocia, one of the most famous tourist destinations of Turkey (Tursab, 1999). Overnight accommodation needs of these tours are met by accommodation facilities located along roads and hotels of the city. In order to cope with possible future developments in advance, it is felt that there is a need for tourism planning that can make use of the local tourism potentials. For this purpose, "Tourism Master Plan" was prepared; this plan presents the approach that tourists' contribution to the local economy can be increased and relations can be established. The purpose of the Tourism Master Plan can be summarised as follows: To commence ideas and make suggestions (a) to determine the potentials of various natural, historical and cultural resources in the province in creating tourist and recreational activities, (b) to identify the present use of these resources, and (c) to utilize unused resources in a forward-looking (in a 15-year perspective) way (Kırcalı,1990).

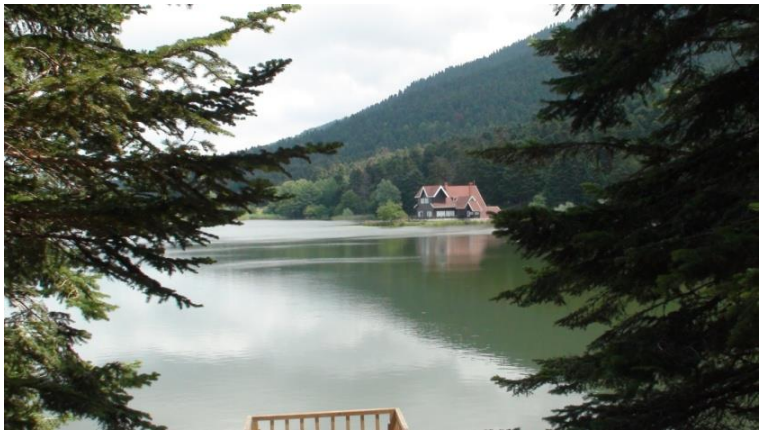

Figure 14. Gölcük, source author

Figure 15. Yedigöller (Seven lakes), source author

5.11. Environmental Problems

In an overall sense, Bolu experiences problems that affect the air, water and soil. Since heating is based on coal, air pollution gets worse in the evening and late evening particularly in winter months. Therefore, the condensing at the city centre increases air pollution, on the axis with central commercial activities on its both sides (on İzzet Baysal Avenue) and thereabouts, where condensed construction and tall buildings hinder air circulation and block the dominant wind direction. Infrastructure works are going on to be able to use natural gas for heating. Bolu is one of the provinces with adequate water resources for drinking and use. However, there is pollution caused by inadequate water treatment and drainage systems. The city's drainage flows into Büyüksu stream which in turn flows into the Black Sea. Rivers are being polluted in Bolu due to agricultural production, industrial activities and domestic waste. Another environmental problem is negative impacts of randomly located poultry farms in the city centre. These farms produce one-thirds of white meat in Turkey and they substantially contribute to the economy of the city. However, these farms produce nasty smells besides upsetting the natural view. They cause environmental pollution and negatively affect tourism. Currently, new farms are not allowed within the borders of the municipality. There are no attempts to displace current farms that are in residential areas. It seems that the public is highly sensitive to environmental problems in Bolu. This is because the province of Bolu has a significant tourism and recreational potential based on natural

environment. Therefore, the foundation of industrial establishments that do not harm the environment is viewed positively by the public. Not allowing every business to build facilities in the organized industrial zone in Bolu is due to environmental sensitivity. It is expected that locally developing positive attitudes towards environmental issues will substantially contribute to economic development of the city without spoiling the environment in the long run (Biar,1990).

Conclusion

In the present study, some evaluations about the physical and socio-economic structure of the city were made. The city's development is adversely affected although it is located in the middle of the two largest metropolises of the country at an equal distance to each of them and on a strong network of transportation connecting these metropolises to each other. However, it is clear that this does not prove effective and beneficial to the development of the city. The city is being rebuilt; low-density and dispersed development (urbanization) which is common in its own right, is emerging. The urban form has been reshaped and common development areas with low density have been emerging. This creates a pressure, particularly on fertile agricultural land, green areas to be protected (forest, fields and orchards, etc.) and water basins. All activities of the city such as commerce, business, and banking have crowded together in a single centre. The civic form that has developed through being restrained and condensing in a certain centre has entered the process of resolution with the housing practices after the earthquake of 1999. It is now possible to decentralize this development which occurred in the form of civic spreading or being dispersed by diverting it towards controlled and defined areas (by creating a small number of sub-centres). Thermal tourism business located in the south of the city has properties of a dynamic structure since it has a potential for development. It is seen that those villages which are close to the civic settlement areas tend to merge with such areas. The villages that have joined the municipal adjacent area in recent years have become districts of the city. Though Bolu has slightly increased its population, it is turning into a city that is spreading on a large area with a more complicated network of relations. Master plan implemented for the whole city of Bolu came into effect in 1985. Urban development takes place according to the current master plan. Housing demands are solved according to local master plans. This situation causes irregular residential areas which are disconnected from each other to emerge. Urban development headed towards the west and north side of the

city. The settlement system of Bolu has experienced a change in line with the phenomenon of earthquake that made itself clear in 1999. The urban enlargement turned into leapfrog development in addition to progressing in "oil stain" pattern; satellite housing areas away from the centre have emerged. The current settlement areas spread through earthquake houses and recently built housing development areas towards the west between the highways; satellite housing areas away from the centre have emerged.

Regular housing emerges in these areas; however, the situation is not the same with the eastern part of the city where the founding neighborhoods are located. Although Bolu does not receive migration, movement from its districts and villages to the city center still goes on. Spatial activities during the long process of expansion cause problems in terms of local and central administrative units. This situation creates pressure especially on fertile agricultural lands (forests, vineyard and orchard areas etc.) and water basins. While regular development occurred in the western and northern parts of the city, an untouched and irregular situation occurred in the eastern and southern parts of it. Based on the beauties of the natural environment, the tourism potentials of the city are being activated. These potentials have not been utilized yet.Development of tourism in the future and use of lands for the service sector, which will spread with a recreational function, may cause pressure in terms of urban planning. The population of the city seems to be developing not so much out of its normal course. Structural change and measures against traffic problem, noise and air pollution are necessary in order to develop the areas surrounding residences by implementing an urban renewal plan in the old districts of Bolu. As a natural result of the type of the population distribution in the urban settlement, there are contradictions between the center and the surrounding areas. This situation is suitable to the following factors:

1. Spreading the population concentration in the city center and the founding neighborhoods close to the center.
2. Reexamination of the location of the industrial site laying from east to north of the city along Ankara-Istanbul highway.
3. Development of the mass housing areas such as building earthquake houses to the west and north, which have earthquake proof grounds, and similar developments occurring around mass housing areas established by the public.
4. Increasing villa type residences built in rural areas within the municipality borders of the city,

5. Carrying on the current and new housing around the fault line in the south, which is not considered to be earthquake proof, with a low level of density and with buildings with fewer stories,
6. Neighboring villages which have recently been included to the borders of the city recently turned into the neighborhoods of the city. These settlements have strong connections to the center of the city and their integration to the city should be facilitated.
7. Urban system develops around a single center. Although housing development areas emerge throughout the whole city, urban developmental pattern around a single center still maintains its characteristics. It is necessary to escape from the center and impose a growth understanding with new sub-centers, to reduce the amount of retail shopping activities in the center, to minimize the traffic pressure and to reduce the attractiveness of the old city center for private sector investments. The old city center should make new choices for the purposes of urban renewal. The amount of intense commercial activities should be reduced and uses intended for tourism should be considered.
8. Since the neighborhoods in the center, which founded the city, were abandoned, the insufficiency in infrastructure and social equipment areas, intense traffic and environmental pollution prevents the improvement of quality of life. The number of problems increases especially in settlement areas developing as a matter of course; problems such as water and air pollution and environmental pollution occur in these areas.

Expectations with regard to the future settlement structure of the city: Bolu province comes to the foreground with the natural and geographical characteristics of its location. The physical structure and development of Bolu city center does not comply with its natural environment;

- It is necessary to determine, develop and realize the social, economic and cultural factors that will develop Bolu and its surrounding area (the whole province),
- Relevant land use regulations for the future should be made in a way not to effect the natural structure (or effect it at a minimum degree) by determining the location of buildings (as residence, infrastructure, social equipment, green areas, industrial areas or public areas etc.) and their relation with each other,

- Natural, ecological, environmental, cultural, historical and urban values and potentials in and around the city should be developed within the balance of preservation-usage and a more livable, planned urban structure and form with increased quality of life should be created,
- The problematic areas determined within the province are to be handled and planned again according to a holistic urban planning approach and urban sprawl, which is not yet so intense, should be prevented.

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