Chapter 11
The Evaluation of Different Processes of Spatial Development from a Resilience Perspective in Istanbul

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11.1 Introduction

There are increasing concerns related to the neoliberalisation of social, economic and political processes, which are pushing the recently introduced spatial policies and new policy instruments in more market-oriented directions, to the detriment of the built environment. In many cities of the world, owing to the complex dynamics associated with the increasing global and local pressures, urban change takes different forms, with important implications on the resilience of cities. Istanbul is one of the best examples of this, where the different types of urban dynamics that can be experienced simultaneously are being illustrated. This makes Istanbul a good study area for defining how the policies and plans adopted to meet the increasing needs and demands can affect a city's resilience.

This chapter aims to evaluate Istanbul's changing urban dynamics, with special emphasis on the policies and plans that have supported urban sprawl and the urban land market dynamics that have intensified the compactness of the urban core, which will be evaluated from the perspective of resilience. The discussion of whether *resilience thinking* allows a new understanding of the policies, plans and practices of Istanbul is based on two case study areas, offering guidance on how the economic, social and environmental changes in Istanbul may be addressed (See Fig. 11.1).
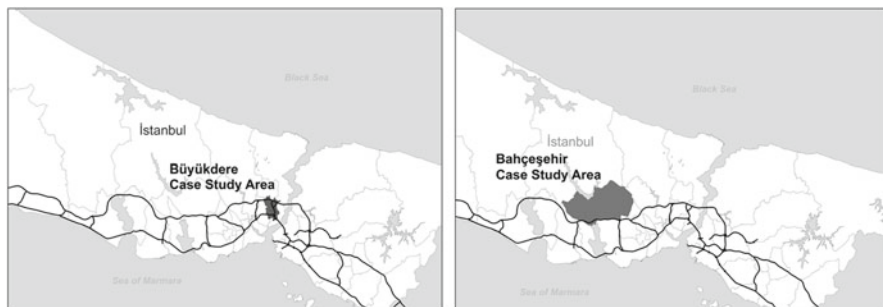
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Fig. 11.1 Case study areas

The first case study area, the Büyükdere-Maslak axis, has been the focus of one particular set of inner city intensification policies, plans and projects, with the intention being to transform a former industrial site into a new urban core with global functions. The second case study area, that of Bahçeşehir, offers a good example of how mass housing projects developed for the upper middle-income groups have accelerated the sprawl of the metropolitan area towards the west and north-west.

11.2 The Changing Urban Form of Istanbul: Intensification of Already Built-Up Areas Together with Escalating Urban Sprawl

Istanbul had an almost compact form prior to the 1980s, containing already built-up areas (according to existing land-use plans), surrounded by areas of informal housing. To satisfy the increasing demand for new housing and areas for other activities, the density of the existing planned urban settlements was increased. The 1980s were a turning point for the urban dynamics in the city, with very distinct impacts on the urban form that included the sprawl of the metropolitan area and intensification in the inner core areas. The changes to the urban dynamics were triggered by shifts in the development ideology and the advent of new major economic policies – from the interventionist/protectionist attitudes of the government following Keynesian policies, to an increasing reliance on market forces under the neoliberal agenda.

However, the most important change was the discovery by the government that urban development instruments and projects could be used as a tool for economic development, as well as for sociopolitical regulation, which defined a "new urban regime" in Turkey (Eraydin 2011). As defined in Chaps. 5 and 7, the new urban regime could be considered as the driver of a radical change in the way central and local governments perceived urban areas and the way they handled urban development, namely, through the increasing dominance of the project-based approach. Projects have played a significant role in shaping the urban form in different ways. Firstly,

some projects have caused an intensification of the reuse of land in the inner parts of the metropolitan area leading to an increase in density in the existing built-up areas, although this was not one of the predetermined targets of urban plans or policies. Secondly, urban sprawl was accelerated as a result of several projects, aimed at meeting the rising demand of the rapidly growing population, that were either totally market-led or were launched in collaboration with the state.

11.3   Case Studies

The *Büyükdere-Maslak axis* development is illustrative of how market pressures have become important in shaping urban form, accelerated by the need for new spaces for new functions within the metropolitan area over the last 15 years (Özus 2009). This area, located in the north-west part of the traditional urban core, was designated as a high-income residential area in the 1950s, resulting in the Levent Housing Development Project and the arrival of different types of manufacturing firms, especially those involved in the pharmaceutical and automotive sectors. The most radical change, however, took place after the construction of the first Istanbul bridge in 1973, which increased accessibility from the Asian part of the city and attracted the interest of large enterprises that were in search of new office spaces. While the plans prepared for Istanbul restricted development along this axis and defined a new CBD close to the existing one, under pressure from large capital groups, developments have since been made along the Büyükdere axis, including the headquarters of some of Turkey's largest companies (Tokatli and Erkip 1998). Moreover, the availability of large industrial land parcels has turned this area into just the kind of place being sought by large-scale enterprises; and today, the axis is home to the headquarters of many prestigious banks; holding companies; research and development facilities; advertisement, real estate and insurance offices; shopping malls and hotels. Consequently, the surrounding areas have come under pressure to follow suit (Özus 2009: 624). At present, the zone still hosts some residential and commercial activities that exist in the shadows of the surrounding skyscrapers (Zone 1). Besides this new modern business core, the immediate surrounding areas, which include three zones with different characteristics, are under pressure to restructure: the high-income residential area (Zone 3), an industrial site for SMEs, and the squatter housing neighbourhoods (Zone 2) (Fig. 11.2).

11.3.1   Zones with Different Characteristics and Transformation Potential in the Büyükdere-Maslak Axis

Bahçeşehir, the second case study area, contains one of Istanbul's largest mass housing projects. Initiated and financed by a public bank, the Emlak Bank, in cooperation with private construction firms, it represents a good example of how projects
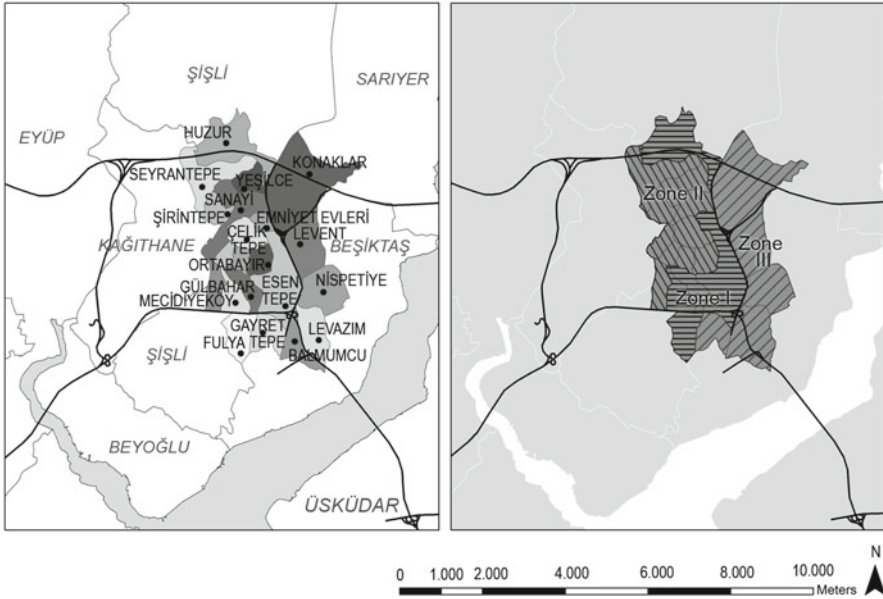
Fig. 11.2 Zones with different characteristics and transformation potential in the Büyükdere-Maslak axis

aimed at providing housing for the increasing population has resulted in increasing the sprawl of this huge metropolitan area and accelerating the invasion of areas of ecological importance. Bahçeşehir is located on the European side of the metropolitan area to the north-west of Küçük Çekmece Lake, 25 km from the metropolitan core. The Bahçeşehir project site, which was formerly farmland, covers an area of around 470 ha (Güvenç and Işık 1999). By 2003, 8,000 housing units had been built, which were home to approximately 24,000 residents; however, the plan was to build 15,500 housing units for approximately 50,000 residents. Bahçeşehir has been the area of choice mainly for middle- and high-income groups, and in fact was promoted as offering a "privileged" and distinct quality of life, distant from all of the negativities of the city, and as a preferable place to live (Kurtuluş 2005: 100–102). The demand for housing in Bahçeşehir was low in the beginning (1994–1995), however, after winning the "Best Practice" award at the Habitat-II Human Settlements Conference in Istanbul in 1996, it became an exemplary model for new developments in Istanbul. The Bahçeşehir project, and similar developments, became synonymous with a new lifestyle and triggered more housing projects and production and business zones in the outer parts of the city. At the same time, the surrounding areas of Bahçeşehir were developed with new projects launched by the State Housing Development Authority and other mass housing projects initiated by private enterprises. The area also features squatter housing districts, residential areas developed by individual owners or developers, a very large industrial site, some rural settlements and a considerable quantity of unplanned land, some of which is still used for agriculture (Fig. 11.3).

CASE STUDY AREA

OPEN SPACES

VACANT and GREEN SPACES

SQUATER HOUSING

RESIDENTIAL AREAS

MASS HOUSING AREAS

RURAL RESIDENCES

INDUSTRIAL AREAS

SPORT AREAS

CONSTRUCTION AREA

COMMERCIAL ACTIVITY

UNDEVELOPED BUT LICENCED AREAS

HOUSING DEVELOPMENT AGENCY: PROPERTY RESERVE ZONES

HIGHWAY

RAILWAY

DISTRICT BOUNDARY

LAKES

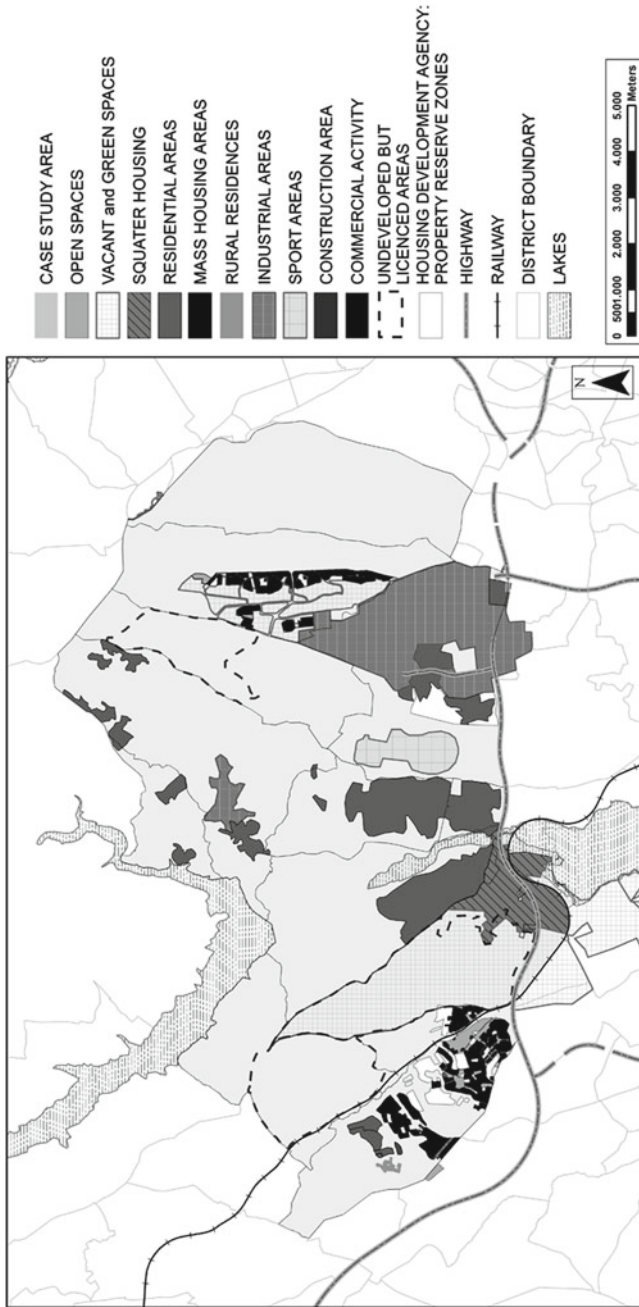0 5001.000 2.000 3.000 4.000 5.000 Meters

Fig. 11.3 Bahçeşehir Housing Estate and its surroundings

11.4   Methodology

How did these two major projects and similar urban development programmes affect
the resilience of this huge metropolitan area? The methodology followed in attempting
to answer this question, as described in Chap. 8, comprises six stages. In the first stage
of the research, the major disturbances exogenous to the existing urban system were
defined, including the changes in the global economy and the impact of new labour and
property regimes under the influence of globalisation. The second stage identifies the
urban subsystems in which the impact has been significant in Istanbul with respect to
three dimensions of resilience, namely economic, social and spatial/ecological. In the
third stage, the main territorial issues under threat are identified. These issues stand out
from the normal trend of small adjustments to the urban system and are referred to as
"changes" or "reactions" to the recently emerging dynamics. A definition of the issues
to be evaluated under the framework of resilience is provided in the fourth stage of the
study, including a detailed analysis of the most significant changes/reactions that have
taken place in the research area, and thus allowing a critical assessment of the existing
plans, policies and projects. In the fifth stage, before the final evaluation, the indicators
of resilience on selected issues are defined in order to test how far resilience attributes
have been taken into account in the different plans, policies and projects. Following
the above five steps of analysis, in Stage 6 the findings drawn from the indicators are
evaluated with respect to the different dimensions of resilience.

The data required to carry out the evaluation has been collected from different
institutions and from questionnaire surveys. Firstly, the data necessary for the
identification of indicators was obtained from different public departments, especially
the Istanbul Metropolitan Municipality and district municipalities. Second, the maps
and plans obtained from different public organisations are analysed with the help of
GIS software to create a database of certain indicators. Third, a questionnaire survey
was carried out of 250 households in the Büyükdere-Maslak case study area and
100 households in the Bahçeşehir case study area, as well as 50 private firms/enter-
prises and 50 tradesman and small manufacturing entrepreneurs located along the
Büyükdere-Maslak axis.

11.5   Findings

The findings on the two case study areas are organised in such a way that the
reaction of the urban system to major disturbances/impacts can be easily under-
stood, while the outcomes are measured with the help of indicators.

11.5.1   Büyükdere-Maslak Axis

As discussed earlier, the Büyükdere-Maslak area is still undergoing a process of
transformation. The most significant changes are taking place along Büyükdere
Avenue, which now contains many high-rise buildings (90 buildings of more than

Table 11.1 The land-use pattern and transformation areas in the Büyükdere-Maslak axis case study area

Land use	Size of area (ha)	% of total
Potential redevelopment areas	16	1.09
Intensified residential areas	54.4	3.71
New developments	104	7.09
Former squatter areas (limited transformation)	336.6	22.93
Existing residential (limited transformation)	391.6	26.68
Transformed into central business activities	152.3	10.38
Industrial areas	93.8	6.39
Military zones	262	17.85
Sports facilities	43	2.93
Public services	14	0.95
Total	1467.7	100.00

eight stories) that house the headquarters of many prominent domestic firms and banks alongside office buildings constructed by either foreign or domestic real estate development companies.

From the case study, it can be seen that almost 10.4% of the area (152.3 ha) has already been transformed into office space on the former sites of pharmaceutical factories and residential areas. The transformation of the study area to date has been on derelict land and land that previously occupied by medium-sized industrial companies. The availability of large plots of land on the major axis connecting the existing business centre with the second Bosphorous Bridge has attracted interest from real estate developers and large-scale enterprises with global functions, resulting in rising land prices, especially for the larger plots of land. Although there are still many low-density and low-quality areas with the potential for transformation adjacent to the recently developed high-rise office towers, the dominance of a small ownership pattern makes transformation difficult due to problems experienced in merging the individual plots. For this reason, some enterprises have chosen to locate in the high-income residential area to the east of the major axis. However, this area was registered as an urban historical site in 2008, and since then, the municipality has been trying to renovate the existing buildings and return them to their original forms and functions, as planned in 1945.[1] Today it can be described as a chaotic-built environment, featuring a high-quality urban core surrounded by squatter housing units, middle- to high-income residential areas and small manufacturing units (Table 11.1).

The change in the built environment and consequently the economic structure has naturally triggered changes in the social structure of the study area. The data drawn from the indicators enables a discussion of the nature of changes and the implications of the urban dynamics of the recent past. The sets of changes defined in the analytical studies, verified by the large set of indicators given in Table 11.2, are grouped under three headings:

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[1] Planned in 1945 by architects Kemal Ahmet Aru and Rebi Gordon. Construction was completed in 1947.

Table 11.2 The impact of external dynamics on urban systems and the indicators used to verify them

Major impacts	Impacts on urban systems	Indicators of resilience
Functional transformation of the study area and increasing global activities	Increasing demand for office space in the urban core	Change in urban landscape
		Increasing number of new buildings
		Level of increase in floor area ratios
	Transformation of industrial sites and residential buildings to CBD functions	Ratio of land transformed for commercial real estate developments to total area
		Decrease in the residential population of the area
		Decline in the open space per capita
	Changes in the composition of activities creating pressure on some of the existing activities such as small manufacturing to leave the study area	Increasing number of foreign firms in producer services
		Change in the share of working population and its distribution by economic sectors
		Increasing differences in the value added by different production sectors
		Change in the sectoral distribution of activities in the study area
		Displacement of activities
Transformation of social structure, triggered by local market conditions	Changes in physical and economic structure of the area, leading to social change and different opportunities for diverse social groups	Share of areas with changing economic activities
		Share of areas to be transformed in the future
		Differences in levels of education of working population
		Residential segregation of groups with different levels of education and occupation
		Negative change in the socioeconomic status of residents
		Weakening social connectedness, trust and collaboration
		Level of population turnover
		Outgoing and incoming social groups to the area
Changing mobility patterns and increasing volume of traffic creating negative environmental outcomes	Increasing traffic load and congestion	Decrease in the efficiency in transportation systems
		Increase in volume of traffic
		Ratio of private car use in total trips
		Speed of traffic flow
		Average commuting distance and journey time
		Modal distribution of trips by purpose
	Increasing energy use and air pollution	Increasing emissions from traffic
		Increase in carbon emissions in the last decade

11.5.1.1 Functional Transformation of the Case Study Area and Increasing Global Activities

The Büyükdere-Maslak axis and the areas in close proximity have proven to be very attractive for foreign capital firms. According to the figures of the General Undersecretary of the Treasury, in 2005 there were 518 foreign capital firms located in the case study area, constituting 10% of total firms in Istanbul and almost 5% of the foreign capital firms in Turkey (11,707 in 2005). Among these firms, 24.7% are engaged in commercial activities, 20.4% in foreign trade, 14.8% in different types of producer services and 9.7% in other sectors with lower shares. More than half of the foreign capital firms are joint ventures with European firms, or are branches of European companies, whereas the share of Middle Eastern countries is 20% and the United States is about 10%.

The change in land-use pattern has had diverse impacts on the existing enterprises located in this area. According to the findings of the questionnaire survey, the existing large-scale enterprises have been positively affected in terms of attracting new functions (41.2% positively affected, 31.2% stayed the same and 27.6% negatively affected). For small enterprises, however, the new conditions have been less favourable, with only 22% witnessing an increase in income, while income levels of the remaining 78% either stayed the same or decreased from the 1990 levels.

The transformation of the area has a positive impact on the competitiveness of Istanbul and supported Istanbul to be able to adapt to the new conditions imposed by globalisation, which enhanced the resilience of the large metropolitan region. However, increasing global functions have put pressure on companies to move their existing activities, and therefore labour, while providing favourable working conditions for skilled people working in new global activities, which has led to increased socio-spatial segmentation. On the other hand, the intensification of core functions within a limited area has had a number of impacts on the urban ecosystem. The increases in building density and the transformation of industrial sites and residential areas to CBD functions on the Büyükdere-Maslak axis have resulted in an escalation of traffic loads, congestion and energy use, thus contributing to a rise in air pollution levels and loss of the resilience of the urban system.

11.5.1.2 The Impact of the Core Functions on the Labour Market and Consequent Transformations to the Social Structure

While the case study area has undergone a transformation to accommodate business functions, the characteristics of the neighbourhoods have also changed. According to the findings of the questionnaire survey, almost two-thirds of the residents moved to the area from somewhere else, while the rest either were born within this district or have been living there for more than 30 years. Most of those that moved to the area after 1990 came from other provinces of Turkey rather than from other districts of Istanbul. In Zone 1, where the transformation is actually taking place, 23.8% of those surveyed have been living in the same housing unit for more than 20 years,

while this figure is slightly lower in the surrounding areas that have undergone only limited transformation.

Many of the households believe that the area still offers advantages as a residential area, since half of the tenants had sought new rental properties within the same district; although those living in the primary transformation zone (Zone 1) complain about decreasing social relations and trust. Besides this, more than half of the households living in rental housing are unhappy with the increasing rents that came with the transformation of the district into a business core.

In the case study area, still it is possible to define the existence of social capital (with the help of connectedness, trust and collaboration of the existing residents), although this varies by zones. Especially in the squatter housing areas, more than two-thirds of households had relatives living in the same neighbourhood, as well as friends and compatriots. While these residents emphasised the importance of social connectedness, in the other zones, the levels of social connectedness and social networking were relatively lower.

11.5.1.3   The Substantial Impacts on Travel Patterns and Traffic Flows in the Metropolitan System due to the Transformation of the Case Study Area

The transformation process on the Büyükdere-Maslak axis has had obvious impacts on employment and population structures: firstly, by creating employment opportunities and increasing the number of people commuting to the area and secondly, by attracting a new working population that wants to be close to the new core functions.

The results of the questionnaire survey showed that a small share of the workforce lives in the surrounding neighbourhoods, while the rest commute in from other areas. While 60.4% of the workforce comes from neighbourhoods on the same (European) side of the city, 36.6% commute from the Anatolian side of the city, meaning that they have to cross one of the two Bosphorous bridges. The second bridge over the Bosphorous (Fatih Bridge) offers a relatively easy connection between the Büyükdere-Maslak axis and the other side of the metropolitan area, which is one of the reasons why the area is considered attractive for urban core functions. However, this has increased the amount of traffic, and both bridges are currently overloaded, leading to decreased traffic speeds and congestion on the connecting roads to the bridges.

The questionnaire findings indicate that of those commuting to work from the case study area, 75.7% are travelling only a short distance, 8.8% are travelling to places relatively further away from the case study area, 9% are travelling a considerable distance from their place of residence and 7.5% are commuting to areas outside Istanbul. The findings also show that 85% of students attend schools outside the case study area but travel only short distances to reach their schools, whereas 5% of the students have to cross to the Anatolian side of the city. The modal share of private cars in commuting journeys is 28.04%, which is close to the estimated ratio for Istanbul.

Obviously, the origin of the trips made by customers to this new urban core is even more important. The questionnaire survey findings show that about one-third (30.5%) of people come from the immediate surroundings, while 33.2% have businesses in the existing urban core and 6.6% commute from the peripheral areas of the metropolitan area. Additionally, the figures indicate that 20.1% of the main customers of the new producer services located on this axis are from different cities in Turkey, and 9.6% are from abroad.

Both the incoming and the outgoing traffic in the area create considerable amounts of traffic load and congestion. Although the recently built metro system has connected this area with Istanbul's traditional CBD, as well as with some of the residential quarters on the European side of the city, it has not been enough to solve the traffic problems. Of the outgoing trips, journeys by metro account for only 5.8% of the total trips, with an even lower for the incoming trips. The results of the interview survey show that creating an urban core in this area has generated more long-distance intra-urban trips than short-distance ones.

The incoming and outgoing traffic, combined with the transit traffic, generates a significant traffic congestion problem, especially during rush hours. According to the figures provided by the Traffic Department of the Greater Istanbul Municipality, the average weekday speed of traffic on the Büyükdere Avenue falls down to 5.6 kph during the morning peak hours and to 11.2 kph in the evenings. The Transport Department of the Istanbul Greater Municipality claims that at the Zincirlikuyu Junction, which marks the start point of the traffic congestion along the Büyükdere Avenue, traffic speed is measured as 34 kph in the morning off-peak hours and 36 kph in the afternoon off-peak hours.[2] Traffic congestion is one of Istanbul's main problems, negatively affecting the quality of life in the city, as the questionnaire survey on the foreign enterprises in Istanbul has depicted (Eraydin et al. 2008).

The increasing volume of traffic and the large number of long-distance trips are major sources of pollution in Istanbul. The stations measuring air quality close to the project area provide evidence of the increasing levels of pollution, particularly during rush hours, negatively affecting the sustainability of the Istanbul metropolitan area. The findings of the study of Istanbul (Eraydin 2010) show that increasing pollution due to traffic exceeds the carbon uptake levels of forests, green areas and the sea. Moreover, the sprawl of the city, which is another facet of metropolitan growth, also has a marked effect on natural resources, especially forestry, which is vital for controlling air pollution levels.

11.5.2 *Bahçeşehir Case Study Area*

While the main actors in the housing market were previously developers and cooperatives, after the 1980s, the government became a key actor in housing provision. Neoliberal principles adopted in the field of urban development after the 1980s

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[2] The figures refer to weekdays in September 2010.

Table 11.3 The land-use patterns in Bahçeşehir and its surroundings

Different land-use development types	Size of the area (hectares)	% of the total
Mass housing areas (already completed)	352	2.9
Mass housing area (under construction)	951	7.9
Urban land stock transferred to HDA	287	2.4
Squatter housing area (not transformed)	273	2.3
Residential area	690	5.7
Industrial zone	865	7.1
Mass housing areas developed by cooperatives	461	3.8
Military zone (within the case study area)	1,274	10.5
Olympic village	149	1.2
Urban green areas	750	6.2
Total built-up or planned areas	6,052	50.0
Total area	11,500	100.0
Agricultural or unused areas	5,448	
Areas transformed from forests	1,974	

defined the housing sector and construction as being at the core of the policies, plans and projects (Türel and Koç 2008), but unfortunately little attention was paid to urban form and the distribution of urban living and working areas. Criticisms have been centred around the increasing travel distances and journey times, as well as on their negative environmental effects, which have resulted in the loss of agricultural land, forestry and the ecosystem.

The Bahçeşehir Housing Development Project, which is located on a former agricultural area, stimulated development on the western periphery of the city. It triggered a population explosion in the small villages that existed in this part of the metropolitan area and motivated the transformation of a substantial amount of agricultural land for different urban functions. The existing land-use pattern, after experiencing substantial transformation, is given in Table 11.3.

The transformations taking place have important implications on the urban systems that can be summarised under three headings, namely, impacts on environment resources, increasing commuting distances and traffic flows and structural changes in the remote periphery. The indicators used to define the impacts of the Bahçeşehir project on urban resilience are listed in Table 11.4.

11.5.2.1 Urban Sprawl and Its Impacts on Environment Resources

Various negative effects of urban sprawl were initiated with the Bahçeşehir housing project in the north-west part of the metropolitan area. Firstly, not only was there a loss of agricultural land, but the environment was also compromised as a result of the excessive demand for environmental resources and ecological services. The loss

Table 11.4 The indicators used to verify the impact of different dynamics on urban systems

Major changes	Impacts on the urban systems	Indicators of resilience
Urban sprawl and loss of environmental resources	New residential projects on agricultural land	Increase in water demand for the projected population
	Urban sprawl	Loss of agricultural land over the last 30 years
		Green areas converted to built-up areas
	Population growth in the periphery	Loss of carbon uptake capacity of green areas
		Loss of endemic flora and fauna
Increasing commuting distance and volume of traffic leading to rising pollution levels	Increasing housing on earthquake-risk areas	Share of building resistant to earthquake in total
	Increased commuting distance and travel time	Increase in average commuting distance and journey time
		Change in modal distribution of trips in favour of car ownership
		Increasing trips using private modes of transportation
		Long-distance trips to workplaces of residents
		Increase in the share of transport costs in household budgets
	Increasing air pollution	Levels of carbon emissions due to volume of traffic
Transformation of the social, economic and spatial pattern of the periphery	Increasing diversity among social groups	Residential segregation among groups with different education levels and occupations
	The socio-spatial segmentation	Increasing differences in the levels of education of population
	High-quality housing supplied for upper socioeconomic group pressures on lower income groups to leave the area	Number of dwelling units by the quality levels
		Change in the socioeconomic status of residents
		Change in social connectedness, trust and collaboration
		Level of population turnover
		The difference between outgoing and incoming groups to the area

of agricultural land over the last 30 years obviously represents a serious economic loss; however, the transformation of the nonagricultural land is also important due to the loss of flora and fauna. For the Istanbul region, being one of the richest parts of Turkey in terms of endemic flora and fauna, this issue is important, but what is also important is the amount of green areas lost to development without planning permission in the vicinity of the case study area, which grew considerably with the arrival of the housing projects.

Secondly, the sprawl of the urban population in this part of the city constituted a major threat to the already-scarce water resources of Istanbul. Some reservoirs can no longer be used to supply drinking water due to residential development in the watershed areas and the subsequent discharge of insufficiently treated waste water into the existing tributaries. In the case of Bahçeşehir, the lake downstream from the area (Küçük Çekmece) exceeded the pollution levels of potable water, and so a new reservoir upstream from the area was required, which has been already undertaken by the Istanbul Greater City Municipality.

Thirdly, not only the Bahçeşehir housing development project but also other new urban growth in this part of the metropolitan area brought about a depletion of forests, which are vital for environmental sustainability in Istanbul. The forestry area converted for residential use and other urban functions from 1990 to 2000 reached 26,740 ha, which is equal to 10.2% of the 2,000 total (Aksakal et al. 2009). Obviously, the loss of green areas will negatively affect the carbon budget of the city, since subsistence of forests on the northern part of the metropolitan are very important for the air quality of Istanbul.

Fourthly, the sprawl of the city to the north-west of Istanbul, where Bahçeşehir acted as a pull factor, has accelerated the construction of buildings in earthquake-risk zones. The legislation to ensure the construction of earthquake-resistant buildings is rather new, and so there are doubts whether the new developments, even those constructed by the public sector, conform to the required standards.

11.5.2.2 Increasing Commuting Distances and Traffic Flows

One of the negative effects of these projects and the associated urban sprawl has been an increase in traffic flows. Commuting to and from this area is either by private car or by other road-based public transport, since the development and its surroundings are not connected to the city by rail or subway, which is a major drawback of the area. The findings of the household questionnaire survey showed that only 22.9% of the household heads worked within the same district, with the remaining percentage having to commute to work. Of these, 53.7% travel by car, 28.3% use shuttle services provided by the firms or public organisations for which they work and only 14.4% use public transport. The data on the location of workplaces of households living in Bahçeşehir showed that almost half of the people have journeys lasting over half an hour, with around 15% having to travel for more than 1 h to their place of work.

11.5.2.3   The Structural Change in the Periphery: Transformation of Remote Residential Areas in the Periphery into New Urban Nodes

According to the 2007 figures provided by the Turkish Statistical Institute, the population living in Bahçeşehir is 15,027; however, the total population living in the surrounding areas, where the construction of housing estates was accelerated by partial plans, was 209,686 in the same year. Most of the people (83.2%) have been living in this area for less than 10 years, having moved from different districts of Istanbul, in particular from the European side, as well as from other cities (17%). Those that moved from the Anatolian side of Istanbul constitute only 5%, while the share of households that moved from the immediate surroundings constitute 20.9% of the total. The rest moved from different neighbourhoods close to the urban core. As expected, 31.7% of the respondents to the questionnaire indicated proximity to work as an important factor in their choice of location. This indicates that not only has there been a sprawl of the residential area but also that increasing numbers of workplaces and industrial establishments have been moving to the outer periphery of the metropolitan area.

The findings of the survey indicate that more than 90% of households are happy living in the area and have no desire to move. Those that consider traffic congestion and their distance from the urban core as problems constitute only 3% of the total. It is apparent that those people that did not consider their distance from the city to be a problem had different activity patterns. According to the survey findings, the lifestyles of people living in the area are restricted to a limited territory that does not extend far from their place of residence. Almost 90% of the population claimed they did not attend social events, while only 6% attend events only in close proximity. Only 4% of the respondents claimed to have attended events in the urban core during the last month, which is similar to the figure for last year.

The respondents claim to have close friends (87.3%), compatriots (53.7%) and relatives (42.6%) living in the same housing estate, which encourages dense social relations and supports closed interaction patterns among the households. These findings mean that for most of the households the place in which they live provides opportunities for social interaction, although some feel that the interaction pattern is quite restricted.

11.6   The Evaluation of the Case Studies as the Outcomes of Policies and Plans of the Recent Past

In recent years, two major policies have brought considerable changes to the Istanbul metropolitan region. First, the policies and projects defined by the Istanbul Metropolitan Municipality, which, with strong support from the central government under the banner of "*supporting Istanbul to become a leading global city*", aimed to create new spaces of attraction for foreign enterprises and major domestic companies.

Beginning in the 1980s, the most prominent domestic firms, while searching for land on which to build commercial real estate, were unable to find available land in the traditional urban core. This, in part, led to the start of the development of the Büyükdere-Maslak axis. Later, the area became attractive to foreign enterprises, creating demand for transformation and intensification in the adjacent zones. The second policy that accelerated urban growth was launched in the early 1980s and brought about a rapid increase in available housing as a result of mass housing projects in different parts of the metropolitan area. Although the number of dwelling units built by small-capital producers was remarkable, the government was keen to encourage the development of housing estates with new amenities that would not be available in the inner city neighbourhoods. The case of Bahçeşehir is a good indicator of how changes in land and housing development policies paved the way for urban sprawl.

It is possible to trace these policies on the three plans of Istanbul since 1980.

The first plan, prepared by the Istanbul Metropolitan Planning Bureau, was drawn up in 1966 by the Ministry of Reconstruction and Resettlement and was approved by the same Ministry in 1980. The proposed urban form in the plan was a mixture of compact and linear forms, since it designated the revitalisation of the CBD and pushed for the expansion of the urban core functions towards the immediate surroundings. The other objective in the plan was the creation of subcentres to minimise average commuting distances. However, the construction of the second Bosphorus Bridge (1988) and the Trans-European Motorway (TEM) encouraged urban sprawl by making high-speed commuting by motor vehicle possible, thus changing the geography of the city.

In 1984, the Greater Istanbul Municipality formed a new City Planning Directorate to replace the Istanbul Metropolitan Planning Bureau. The new directorate prepared a new master plan at 1/50 000 scale, which was approved by the Council of Greater Istanbul Municipality in 1995. This plan aimed to retain the importance of the CBD and proposed its expansion towards adjacent areas. The relocation of industry from central locations, particularly of those causing pollution, to the fringe and the transformation of former industrial sites for office and other commercial functions were expected to create the required space for the enlargement of the CBD. This plan also designated new housing areas at the fringe, such as in Bahçeşehir, to serve the increasing population and to relieve pressure on the land and housing prices in the inner city. Regularisation schemes for most of the former unauthorised housing areas and improvement plans for such settlements were prepared and approved in accordance to the Building Amnesty Law (ratified in 1984). In summary, compactness was preferred to sprawl in the location of service sector activities, and of industry to some extent, while tolerating the expansion of residential areas towards the fringe, thus clearing the way for sprawl.

The third plan, at 1/100,000 scale, was prepared by the Istanbul Metropolitan Planning Office (IMP) of the Istanbul Greater City Municipality, following the enlargement of the municipal boundaries to the boundaries of the province in 2004. During the preparation of this plan, it was calculated that Istanbul could accommodate a maximum of 16 million inhabitants based on its ecological thresholds – constituted

by the existing preservation zones, water catchment areas and forestry land; however, the indications are that the population will reach 22 billion by 2020. The plan proposed a change in the composition of certain activities in the metropolitan areas, such as a reduction in the share of industry in total employment to 20% and a rise in the service sector's share to 80% by 2020. The plan proposed to retain the CBD in its existing location but to develop two subcentres and one "attraction centre" on the European side, along with three subcentres and one "attraction centre" on the Anatolian side. The aim was to enhance the decentralisation of some of the service activities to subcentres due to physical limitations preventing the expansion of the CBD. The development of new residential areas, on the other hand, was proposed at the fringe in the form of large estates with many shared services and amenities. From this it can be seen that the decentralisation (and sprawl) of housing was ahead of the decentralisation of service activities at this stage.

In addition to these strategic master plans, several local plans have been prepared, defining building rights that will lead to different physical outcomes. For example, although the 1980 Master Development Plan was against the development of the city towards the north, local plans such as 1988 Büyükdere Avenue Implementation Plan increased the floor area ratio (built-up area/total size of the parcel) to 4.5 for parcels located on Büyükdere Avenue. The changes in building rights, contrary to the decision of the master plan, had been a driving force in the development of an international business centre along the Büyükdere-Maslak axis. Similarly, in the Bahçeşehir case, although the plan for this area was to provide a certain quality of life, due to the partial planning practices and the increasing number of housing estates built by housing cooperatives and private developers, the area has taken on a rather chaotic structure.

This brief evaluation of policies and plans shows that, although environmental concerns were expressed at different levels, the concerns for environmental sustainability became a residual issue under the pressures of economic motivations and the rapidly increasing demand for housing, workplaces and other facilities. In Istanbul, being the major centre of attraction in population movements both from different regions of Turkey and abroad, planners were forced to open up new areas for different uses to meet demand, although ecological limits were evident. Moreover, it can be said that the existing plans failed to control and guide urban development. The decisions to protect natural resources, which are vital for this huge urban settlement, were not effective enough to control the growth of new housing and other urban functions in protected areas, particularly those in the water basins and forests to the north of the metropolitan area.

11.7 The Contribution of the Resilience Concept to Understanding Urban Processes

In the last stage of this project, the urban processes represented by the case studies with reference to the economic, social and environmental dimensions were explored with the help of a set of indicators. The indicators denoted to what extent the built

environment had transformed to meet the new conditions defined by the global process and the transformability of the economic structure under global market pressures. The selected indicators show that the capacity of the urban system to respond and adapt to changing conditions has been rather successful. New conditions trigger changes in the built environment, as well as in social and economic structures. Transformation projects, new urban built-up areas and changes in the composition of activities are positive indicators of adaptability, although the cost of adaptation has been on the back of the labour markets in the form of increasing income differential, leading to increasing residential segregation.

In answer to the question of whether the city is prepared for change or not varies among the different social groups, as can be seen from the analysis of the Büyükdere-Maslak axis, while same can be said also for the built environment. The indicators show that while some areas are able to adapt to global pressures, the adaptive capacity of certain areas is, in contrast, rather limited. The reason for this is the limited flexibility of certain built-up areas and the difficulty faced in meeting the increasing demand generated by the transformation of activities within the area. Moreover, adaptation creates problems in terms of connectivity. Flows within the metropolitan area have become difficult, indicating a decreasing resilience of the urban system; however, the most important issue is the limited recovery experienced in terms of the degradation of environmental quality.

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