



Sustainable and Resilient Planning, Developed Housing Models for Istanbul

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Abstract

This study presents an updated research on the housing planning of Istanbul in the context of sustainability and resiliency as well as the searching innovative models. Due to increasing awareness since the late twentieth century consequently, Climate-change responsive design and planning, sustainability and resiliency became the new design phenomena in housing planning in the world. However, this awareness process needed a much longer period for Istanbul, Turkey, and this was possible with Covid-19. As a driver, first the climate-change and later Covid-19 now radically altered the design and planning ideologies and doctrines that would mitigate the effects of global warming. In this discursive transition period, the environment and climate-friendly design have initiated searching for new housing models considering sustainability, resiliency and green architecture as new planning criteria, especially after the Covid-19 that led to changing lifestyles as well as the working conditions. This paradigm shift has emerged the need for a consensus of interdisciplinary approach that emphasized sustainable and resilience science in architectural design and urban planning. In this context, the overall design discourses have also been updated since Climate-change has become a central focus characteristic of cities. Due to environmental and climate concerns, especially after the Covid-19 housing models have started to evolve into the new, and innovative models from the traditional models. Also, this design discourse aimed that the potential reuse of old housing models with the recent come-back presented new, innovative and sustainable housing models that will be developed in future.

This study focused on envisioning the new and innovative housing models and typologies in the context of sustainability and resiliency in the world as well as the

models were transferred from the other countries to Istanbul city. Due to changing demand for housing models especially after the pandemic a new plan was initiated by private contractors who intend to produce sustainable friendly projects soon with more green areas to meet people's new requirements. It was revealed that sustainable and resilient designs in the world are closely followed in Istanbul, and although the Climate-change issues have not created expected awareness in Istanbul so far, however, future developments for the city were more promising, especially in the post-Covid-19 period, the radical changes were seen regulations and housing models with more low storeys and more green areas.

Keywords

Housing • Istanbul • City planning • Multidisciplinary design • Resiliency • Sustainability

1 Introduction

Nowadays, due to increasing awareness consequently Climate-change responsive design and planning, sustainable and resilient sciences became the new design phenomena in the housing planning in the world and Istanbul, Turkey. In the last forty years, the climate-change phenomenon and especially the recent emerging Covid-19 issue led to a new conceptual transition in architectural design. Despite much research examining the housing issue in Istanbul, the updated studies were very few and that a new study focusing on Istanbul's recent problems now interwoven with sustainability as well as the Covid-19 and people's recently altered lifestyles and its reflections on new housing demands and model, is needed.

This research aimed to make a contribution to recently promising sustainable developments of the city including architecture, submitted updated elaborated housing models

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and typologies to guide future housing planning. Also, purposed to submit unique content, this research included an anachronic approach referenced housing models in Istanbul developed since the beginning of the twentieth century as well as aimed to contribute to and updated them focused on new, innovative housing models that emerged in accordance with changing lifestyles with the climate-change and recent pandemic Covid-19.

The housing problem of Istanbul entered into a more chaotic transformation process which was accelerated by the migrations after the 1950s. Most notably migration issues were significant on the city's agenda, especially in the last twenty years such as; inner migrations, transnational migrations, earthquakes, climate-change and finally the Covid-19, etc. The housing problem of Istanbul was related to its population and demographic structure due to uncontrolled internal and transnational mass migration problems for years. According to the United Nations which was featured the cities that exceeded 10 million as mega-cities (United Nations, 2007), also included to Istanbul in this categorization with a nearly average European country size population. (Fig. 1) The preliminary report prepared by the United Nations Development Program (UNDP) was specified as the goal 11: it was foreseen that almost 60 per cent of the world's population would live in urban areas in sustainable cities and communities by 2030.

The recent pandemic Covid-19 led to radical transformations in the lifestyles and housing models of the people who were living in the big cities. After the pandemic people who lived in the United States started to escape from big cities toward Suburbans or small towns (Wall Street Journal, 2021). As a striking example after the pandemic according to the latest research in Canada, rents in one of the big cities Vancouver center fell by 9 per cent as cities shifted to the surrounding countryside (Vancouver Bilgi, 2021). In Istanbul, the housing demand of people radically changed and needed to rethink the city's planning agenda and housing models after the Covid-19 simultaneously in the world. The pandemic and social distance made people who were clustered in their houses for a long time needed to question their lifestyles and houses about how healthy and how livable. Hence, previously people's highly demanded city centers considered more valuable districts now are gradually replaced by the idea of living in the countryside which was seen as a healthy environment that symbolized their changing lifestyles. In Istanbul, with the new request of the people, the models and labels of the new housing projects were altered and started to develop in outer areas of the city towards the northern forests, green areas and even close towns.

Although the issue of sustainability was underlined once again at the Climate-change Conference, in Istanbul, in

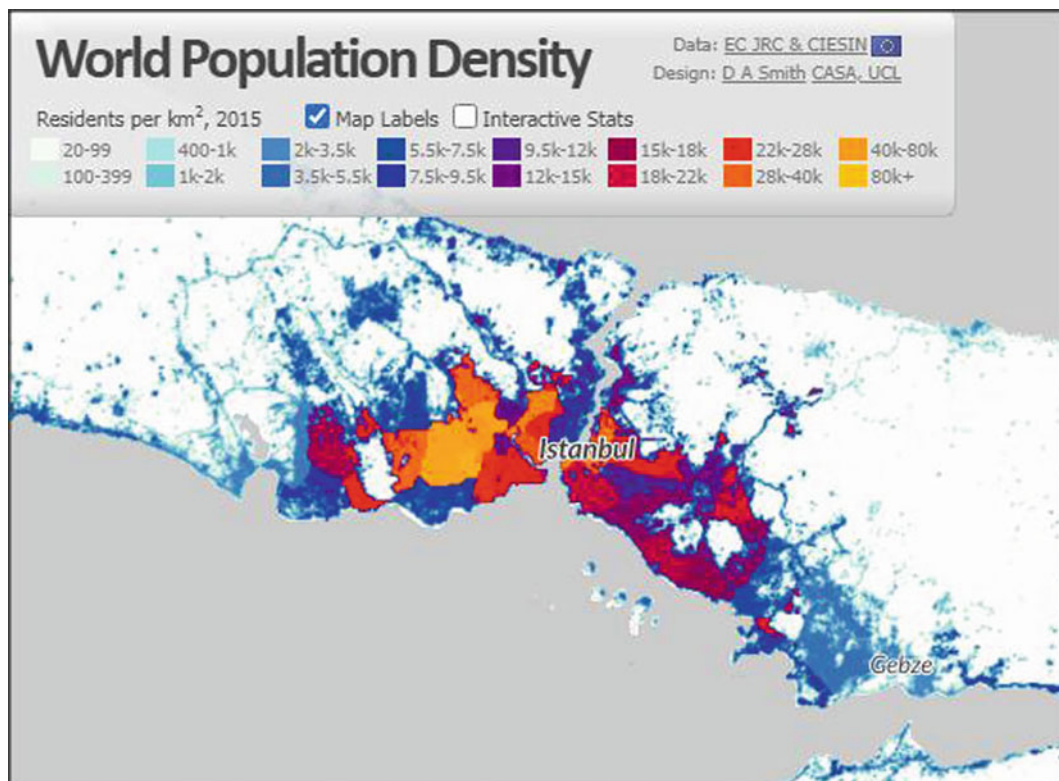


Fig. 1 Population of Istanbul City. World population density

1996, as a significant matter on the agenda, it did not create awareness as expected to specify housing policies and models also had some problems to take steps on necessary precautions in this regard. However, the Covid-19 made this effect more visible and accelerated, which could not be created with Climate-change previously. Nowadays, with the world Climate-change agenda, the sustainable and resilient sciences have become new design phenomena to determine the housing models and typologies in the world, also in Istanbul, Turkey.

Due to the climate-change issues, rapid changes were seen in the recent world agenda and in Istanbul, especially after the Covid-19 with the innovative design and housing planning discourse. Furthermore, in this context, some of the twentieth century urban planning theories and housing models in England came-back like the “garden-cities”. Indeed these old “garden-city” models were first transferred to Istanbul from Europe by French architects, in the early twentieth century and then the latest English version was adopted in the city as modern housing planning in the late twentieth century. The new, innovative housing models and settlements developed as new “garden-cities” were originally taken from the old English models, in the early twentieth century. Also, similar to the Welwyn example, the old models at the beginning of the twentieth century were examined due to their potential reuse in the future housing planning also to contribute to the development of original ideas new and innovative models for Istanbul.

These old housing models have already begun to be implemented in the world and their versions in Istanbul were also reviewed in this context. Hence, due to a research gap, needed for an updated study on housing issues in this research, the new, innovative housing models which would be generated after the recent pandemic Covid-19, as well as the old, existing models developed in the twentieth century, were examined. Due to changing demand for housing models after the pandemic, Türk İnşaatçılar Birliği (Turkish Builders Association) has initiated a new construction declaring that they will intend to produce sustainable friendly projects soon to meet people's altering new requirements (Hürriyethaber, 2021). Also, Turkish private contractors explained that they concentrated on new housing ideas indicating their new term policy producing healthy-city concept houses with more green areas (Habertürk, 2020). They specified new criteria for new houses with the gardens or balconies to be produced in the future as well as the altered new housing typologies with an additional working room for distance working as a necessity after the Covid-19 pandemic where it has become significant for residences. They launched more horizontal buildings and garden-cities with more green areas instead of multi-story tall residences to create a sustainable relationship between urban dwellers and urban areas (United Nations, 2021). Therefore, new

housing labels were generated that matched people's demands such as; green-houses, healthy-houses, terrace-houses, lake houses, forest houses, etc.

Especially since the issue of climate-change came to the fore, many innovative designs and implementations have emerged in architectural and urban design in the last thirty years. The new and various housing settlements and city models were generated with original design ideas combining the requirements of resiliency and sustainability such as; Abu-Dhabi's Masdar city which was planned as a zero-carbon eco-city, Chinese and Singaporean eco-cities or Saudi Arabia's new sustainable city which has come to the fore very recently as the car-free city (NTV News, 2022).

The new and modern housing models initiated to develop in the cities since the beginning of the twentieth century, and the first Istanbul Master plan was planned by a French architect-planner. Also, for many years, the housing models have been transferred to Istanbul city via European housing models, especially in France and Germany such as; garden-cities, satellite-cities, building-blocks, apartments, etc. With the Climate-change and especially after the Covid-19, these old housing models of the twentieth century have evolved into the new and innovative models such as; low-rise, and sustainable friendly houses which would be planned with more gardens and green areas.

2 The Methodology

Due to recent developments and environmental and climate concerns, housing models have started to evolve into the new, and innovative models from the traditional models known by us so far. This study focused on new and innovative housing models as well as the potential reuse of old housing models, with the recent come-back presenting new, innovative and sustainable housing models and typologies that will be developed for future cities.

This research aimed to present a new vision of Istanbul city's sustainability issue via examining the old housing models for potential use in the future as new and innovative models like the Welwyn city which was recently a come-back. Likewise, the example of England with the newly emerged people's demand on living in green areas led to the come-back of garden-houses and due to their potential use in future projects garden-houses and satellite-cities in Istanbul were examined. We presented the subject that centered the sustainability and resilient city in this study housing planning and models examined within two contexts and offered propositions. The first context was about Istanbul city and housing models the garden-cities, satellite cities, etc. transferred directly or indirectly from Europe (France, Germany, etc.) since the early twentieth century and their potential re-use in the future projects in Istanbul.

Table 1 Housing models developed in the context of the sustainable and resilient plannings in Istanbul:

	The old housing models might be developed for future
1	Old Garden-Cities As Today Eco-friendly settlements
2	Satellite-Cities As Today Eco-friendly settlements
3	Sustainable Regenerations
4	Eco-Cities, etc.
5	The other Models

A taxonomy was prepared to specify the new and innovative housing models to make connections to their historical references with an anachronic, morphological research methodology that determined the first part of the research. The second part focused on an analytical framework for the sustainable and resilient city models and housing examples in the world, such as sustainable cities, resilient cities, eco-cities, etc. were examined in a wide spectrum, along with the housing models in Istanbul. The examples included the Masdar City project in Abu Dhabi, China and Singaporean eco-cities, sustainable regenerations or further examples from different countries.

Even though the 1996, Climate-change conference was held in Istanbul, it did not generate any satisfactory interest. However, the Küçükçekmece region opened to new, innovative projects in the 2010s, where some prominent world architects participated in the competition including, MRDV, Kengo Kuma and with a large-scale eco-city Ken Yeang along with Zaha Hadid architects with the large-scale regeneration project in the Kartal region.

Furthermore, modern garden-cities and their derivatives developed after the 1980s on both the European side and Anatolian side in green areas in Istanbul as large-scale modern garden-city projects. Recently, some large-scale projects and small-scale housing plannings implemented by private contractors recently after Covid-19 such as; healthy-houses, terrace-houses, forest-houses, etc. were examined.

On Conclusion, the inferences that emerged according to some housing models and typologies that might be used as an example for future planning in the city in the context of sustainability and resiliency were presented.

3 Istanbul, Housing Models and Problematics Since the 20th Century

Indeed, many housing models like the garden-cities, satellite cities, etc. in Istanbul were transferred from Europe; France, Germany, etc. since the early twentieth century. Recently, old city planning methods and old garden-cities have comeback. The Welwyn city, an original garden-city the model first initiated by E. Howard, England was renewed

(Smith, 2021, p.2). Likewise, the example of England, where newly emerged people's demand for living in green areas led to the come-back of the garden-houses along with their potential use in future projects led to these old, existing housing models such as garden-houses and satellite-cities in Istanbul that were examined. Especially as it remodelled again from old, "garden-cities" to new and innovative models, it is also preferred to renew old models as in Welwyn in England (Table 1).

3.1 Istanbul: Beginning of the 20th Century, Towards 1990s, Housing Plannings

• French Planner Henri Prost and The Early Garden-city and Modern Block Plannings

In the history of the city, the first Istanbul Master plan was prepared by a French architect-planner Henri Prost who was invited by Atatürk, the founder of the Turkish Republic. In the 1930s, the Republic of Turkey is a newly established state and after the World War I out the country was full of debts and was taken over and the Turkish economy was far from providing the capital accumulation required by the modernization framework (Tekeli, 2002, p.158). Between the two World Wars, the statist structure of the 1930s, the country's limited resources were preferred to devote to industrialization, instead of the new housing constructions and their improvement (Çoban, 2012, p. 78). According to the policies of the new Turkish State, although Istanbul was no longer a capital city, the idea of "modernization" of Istanbul would be still in the country's priorities for future planning provisions.

In the early Republican period Turkish housing models were shaped mostly via German émigrés including Bruno Taut, Ernst Egli, H. Jansenn and planning of the Istanbul city specifically was given to the French architect-planner Henri Prost due to his Paris city modernization project at that time and with this idea make Istanbul a Parisien style modernized city. German planner M. Wagner prepared a report according to the housing problematic and he emphasized that the new constructions consisted of a small number of new houses only belonging to wealthy citizens and no new

construction activity was undertaken on the large-scale public yet (Wagner, 1938, p. 85).

Istanbul was planned by the French planner Henri Prost and according to his colleagues planning reports arrived in Istanbul prior to him; A. Agache, Lambert, etc. (Prost, 1949) His Master Plans for Istanbul were known as a modernization project focusing on the city's transportation problems (Bilsel, 2011, p. 10). The Paris city planning was under the control of the *Le Musée-Sociale* (Social-Museum) at that time (Rabinow, 1995, p. 256.). Before arriving to Istanbul with the special invitation of the Atatürk of Istanbul previously, he and his colleagues planned Paris city modernization after the his predecessor E. Hénard (Bruant, 2011, p. 246) His method was derived from old, French urbanism schools *l'aménagement* (regulatory) and *l'embellissement* (beautifying) planning tools which affiliated twentieth century's vehicle oriented modern planning (Fig. 2).

This was based on Henri Prost's housing models, stemmed from the theoretical and doctrinal social thought structure that examined the solution to the housing problem, by F. Le Play which was seen as a missing part in the French society after the French Revolution (Choay, 1969, p. 104). In the H. Prost Plan reports, in accordance with the his "zoning" method, Istanbul was divided into some specific areas; "residential areas", green areas, espaces publics, industrial areas, and airports, etc. inspired by the French Cornudet laws: "*l'extension*" (extension) "*l'embellissement*"

(beautification), (Coskun, 2020b). Although he planned a modernization plan, some "residential areas" were implicitly planned in Henri Prost's Istanbul Master plan that transformed French originated housing models and typologies which had been influential in the housing history of the city (Coskun, 2017, p. 193) (Fig. 4).

During the H. Prost period, different classes were lived in different districts and neighborhoods of the city; Historical Peninsula; Pera, Taksim, Nişantaşı Axis, Beşiktaş and Bosphorus shores; On the Anatolian side, Kadıköy, Üsküdar. H. Prost also intervened in the city's "geographical", "socio-economic-cultural" differentiated social structure since the nineteenth century; in the Historical Peninsula, the Turkish-muslim poor and the newly developing "middle-class" Turkish petty trade *bourgeoisie* (provincial made plans according to the new public profile of capital (Fig. 4).

Since Henri Prost was in Paris, before the 1950 elections, in 1949, by the Mayor of the time, L. Kırdar, asked about the planning of a new large-scale housing project in the Levent district from his colleague Aron Angel who had earned the urban-planner degree from the *ÉSA, l'Ecole Spéciale Paris* (School of Urbanism in Paris), where H. Prost also lectured (Frey, 2011, p. 7). Although H. Prost's Levent project was partially referenced to the "garden-city" models in France, A. Angel declared that some block concepts and architectural elements were inspired by Le Corbusier's

Fig. 2 H. Prost, Istanbul Zoning Plan 1937, First Applied in Paris, later in Istanbul; Historical Peninsula (left), Pera District (top), Anatolian Side (right), Residential Areas. IFA Archives. Académie de l'Architecture/Cité de l'Architecture et du Patrimoine/Archives d'Architecture du XXe Siècle, Paris



project *Unite d'habitation Marseilles* that were raised above on *pilotis* (specific French term columns) (Le Corbusier, 1980, p. 180). Likewise, he also preferred the Corbusien discourse a design concept with respect to natural continuity of the city refraining from the intervention of nature instead of placing a large-scale concrete block directly on the green areas (Figs. 5 and 6).

A. Angel and H. Prost's Levent project which was planned in accordance with the utopian discourses of the time (Choay, 1979) and followed the Fourier's futuristic ideology of social collective living in a *phalanx* (a palace like apartment building idea originally based to only big-scale resident *Palais de Versailles*) was deemed inappropriate by the new government, citing "social" life norms that did not coincide with the Turkish family lifestyle. After H. Prost, Turkish architect-planners K. Ahmet Aru and R. Gorbun re-planned the project with a French-style bank-Municipality system constructed by Emlak Bank. Dependent on a new system the Levent projects were designed as single-family villas, or multi-unit small blocks that were practiced by state-supported banks and catered primarily to middle and upper-middle-income families seen as potential clients having had saving loans in the project that was not aimed at low-income people (Bozdoğan&Akcan, 2012, p. 150). However, H. Prost would explain that he was against K. A. Aru's middle-class project after a while because he defended social policies (Akpınar, 2010, p. 178).

Due to the as newly established country and just out of war, Turkey's credits of the human and economical resources were found insufficient. Also, some institutions required the large-scale housing construction such as the banking system, construction institutions, not established yet and building new houses which was not easy likewise in the developed countries in housing construction such as France. It was also not possible to transfer new housing models from France or Europe due to the absence of institutional structure in the country. Moreover, it would take a long time to establish such developed institutions and operational requirements.

Hence, Henri Prost had to keep his planning limitedly concentrated only on "modernization" projects instead of housing. He provisioned and declared that: "Istanbul, should be planned according to *l'embellissement* (beautification) and landscaping plan with new roads that would utilize the lands instead of construction of the "new houses" (Prost, 2008, p. 122). With this decision the problem of opening "new housing areas" in Istanbul, was postponed to be seen as a secondary importance long years until the mid-twentieth century in the 1950-the 60 s due to economic problems. However, this decision would make the housing problem even more problematic in the next years with the increasing mass migration.

3.2 The Earlier Models Come Back, as Today New Sustainable and Resilient Houses

• The Early 20th Century Garden-Cities Istanbul Transferred From French *Cité-jardins*

Henri Prost's Istanbul Master plans reflected that he had knowledge about various housing models and typologies in his tool bag before arriving at Istanbul. One of the most important models was the English "garden-cities". This model was introduced to France for the first time by Henri Prost's close colleague Léon Jaussely. Furthermore; he was the first French planner who transferred British urban planning principles to the France urbanism via Adshead's planning techniques—(*Town Planning Practice* by S. D. Adshead) the theory and practices of cities such as Berlin, London and Paris (Paquot, 2013, p. 27).

Although Henri Prost made plans for the modernization of the Paris city, *PARP, Plan d'Aménagement de Région Parisienne*, (Paris City Region Plan) (Merlin, 1991, p. 60) he was familiar these housing models via his colleague Léon Jaussely's book and Henri Sellier, who were the pioneers of construction, and these housing models. In 1919, planned *cité-jardins* (garden-cities) in Paris, L. Jaussely and H. Sellier achieved first prize the *l'Extension de Paris et l'Aménagement de la Région Parisienne* (Arrangement and Extension Project of Paris Region) (IFA Archives, n.d.), (Sellier, 1998, p. 22). However, like large-scale *cité-jardins* (garden-cities), HBM, HLMs, in the Paris *banlieues* (sub-urbs) social-rental housing for low-income people were implemented by Henri Sellier (Stébé, 1998, p. 77). Also it was proposed that the construction of the these housing models should be increased in Paris during that time to serve the middle-class (Guerrand, 2011, p. 292) (Fig. 7).

Although all these housing models were not explicitly seen in the Prost Master plan, the suggestions and location selections of various housing models and typologies were included in some plan notes and reports in these plans. Since the housing models in all of Europe during that period between the two world wars were similar (Dogrusöz, 2016) Henri Prost envisioned that the some housing models were primarily concentrated on two models, which were also widely used in Europe at that time; *cité-jardins* (garden-cities), and *villes-satellites* (satellite-cities).

Indeed, similar to the E. Howard's British "garden-city" ideas some "garden-city" versions were planned in Istanbul city's outskirts, in green areas or in parks, and woods sunny, healthy lifestyle for people. According to Henri Prost's Anatolian Side Master Plan *Le Plan de Côté d'Asie* and reports: in historical passages in Anatolian Side there were "houses with gardens" in these districts including Erenköy

and Bostancı. H. Prost, instead of interfering with this texture of the city, proposed some naturally arranged “garden-houses” planning that support the emerging development. First transferred to Istanbul, via French architect Henri Prost derived from French *cité-jardins* (garden-cities) (Prost, 1948) envisaged a pragmatical view to solve the Istanbul housing problem (Dogrusöz, 1981) with French *Le Musée-Sociale* (Social-Museum) (Rabinow, 1991, p.251). These housing models were implemented after H. Prost left the city, in the 1960s post-Prost era. which were developed as middle-class “garden-city” houses on the Anatolian side (Fig. 8).

“Garden-city” models known as first applications later were developed on the Istanbul Anatolian side; in Kadıköy, Acıbadem, Koşuyolu, etc. In the 1960s, in order to find a solution to the increasing housing problem, as a physical reflection of economical policies these “garden-cities” were planned hastily and schematically for the newly established middle-class. After H. Prost, the outskirts of the city suburbs were based on the creation of the new Turkish middle-class with the newly built “garden-cities”. These models were developed as a Bank-municipality model in Istanbul according to HLM, a French-originated housing production model built by bank brands such as; the İşbank houses, Yapı-Kredi bank houses, Emlak bank houses, etc.

In the era, Turkey was a country just out of the war and was lack of the economical resource and advanced housing construction institutions as developed countries such as France; HBM, *Habitat Bon Marché* (Social-Rental Housing), and HLM, *Habitat Louer à Moyen* (Medium Rent Houses), and other institutions such as banks, and

municipalities etc. also, *La Société D'aide Mutuelle* (Social Assistance Institution) produced houses for low-income people supported by social-insurance as an institution for HBM (Horne, 2002, p.264). Housing production in Istanbul has evolved into a completely different system since the 1960s, after social policies were abandoned, and housing production was left entirely private sector. Henri Prost Master plans later deviated from its purpose and became a political tool of the new government, and some projects envisaged by H. Prost, including housing projections, were realized long after H. Prost left the country. After H. Prost an Italian architect-planner was invited to Istanbul to prepare new Master plans (Fig. 3).

3.3 The Earlier Models Come Back as Today's Sustainable and Resilient Design

• Henri Prost's *Cité-Parcs* (Park Cities) Planned Uniquely For Istanbul in Bosphorus Heights

In Istanbul's Bosphorus Heights, Henri Prost planned *cité-parcs* (park-cities) to save the green areas, groves and woods which were been neglected for many years emphasizing his historicist aspects as more realistic and less interventionist and aimed to protect Bosphorus groves (Bilsel, 2010a, p. 139). On the Bosphorus slopes, Henri Prost envisioned some settlements as *cités-parcs* (park-cities) Anatolian Side Master Plan, *Le Plan de Côté d'Asie* works that was compatible with green areas and groves according to his plan notes. As an original model this housing model was

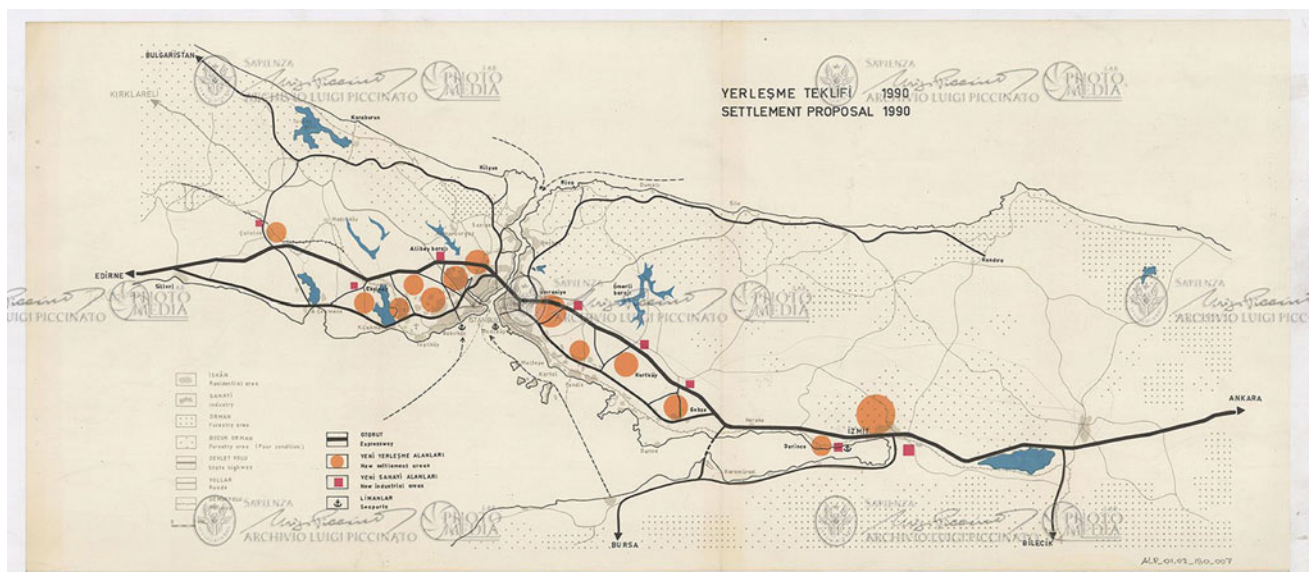


Fig. 3 Italian Architect-planner Luigi Piccinato, Istanbul Zoning Plan, 1950s, The Settlement Proposal Plan (Red). Archivio Luigi Piccinato, Università Roma La Sapienza, www.luigipiccinato.it

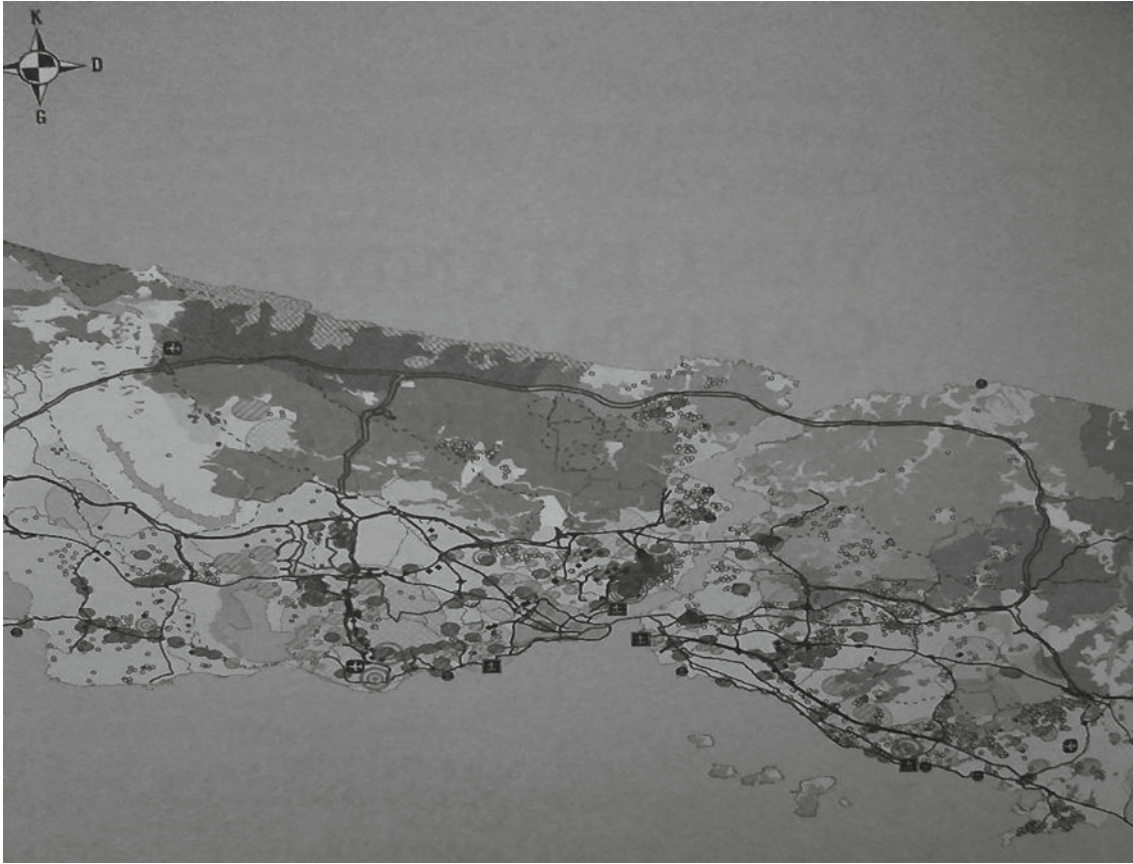


Fig. 4 Istanbul, After the 2000s, Housing Density and Urban Sprawl towards Northern Forest. Map, Yeni Istanbul Çalışmaları

produced specifically for Istanbul. H. Prost's *cit -parcs* (park-cities) were similar to the British “garden-cities” transferred from Howard's ideas adopted uniquely to Istanbul city's groves (Howard, 2008) (Fig. 9).

The *Cit -parcs* (park-cities) resembles the “cit -jardins” (garden-city) and this unique model planned within less densely populated areas without compromising the picturesque integrity of the Bosphorus different from the “garden-cities” with common land use to all garden owners without division of property. Later, in the context of the protection of the existing groves in the Bosphorus, Yıldız Park, Mirg n Grove, K c k  amlıca Grove,  ubuklu Grove was purchased by the Municipality and arranged as a “public-garden” (Bilsel, 2010b, p. 369). H. Prost intended two main purposes, to ensure the protection of these picturesque groves on the ridge of the Bosphorus, and to create living spaces in greenery for the elderly people to spend their retirement. H. Prost envisioned the planning Anatolian Side with “garden-city” projects in his Anatolian Side plan *Le Plan de C t  d'Asie* which was a natural existing urban tissue consisting of houses with gardens. However, the housing project proposed in accordance with Bosphorus's picturesque view with the unique ideas of his French model *cit -parcs* (park-cities) did not applicate in reality.

After he left the city, some the similar plannings were implemented by the private contractors more densely. Thus, the Bosphorus heights green areas, the groves, and woods were developed uncontrolled, on the Anatolian side in the districts of Kadık y,  engelk y, Kandilli, etc. (Fig. 10).

3.4 The Earlier Models Come Back for Today's Sustainable and Resilient Design

- **1950s, *Villes-Satellites* (satellite-cities), Istanbul Atak y District by Italian Architect Luigi Piccinato**

In this context, *villes-satellites* (satellite-cities), which emerged as a very innovative model in the middle of the twentieth century, have been transformed into a house creating a model in the context of today's innovative sustainable and resilient city planning. Although previously it was not considered as a sustainable model, this housing model, which was built in planned and controlled zoning areas at the far border of the cities and in green areas likewise today's sustainable planning, was also considered an early model of sustainability, like garden-cities.

Fig. 5 Levent Project, first planned by H. Prost and A. Angel later Turkish architect-planners K. A. Aru and R. Gorbun as a first large-scale middle-class project. Photos, (Left), Arkitera, (right) Bozdoğan, Akcan



Fig. 6 Levent Project, first planned by H. Prost and A. Angel later Turkish architect-planners K. A. Aru and R. Gorbun as a first large-scale middle-class project. Photos, (Left), Arkitera, (right) Bozdoğan, Akcan



In the post-Prost period, the 1950s, after the Henri Prost left the city, an Italian architect and urban planner Luigi Piccinato was invited to Istanbul as the head of the newly set planning office of Istanbul city who had previously realized zoning plans in London with Abercrombie (Malussardi, 1993, p. 49). Indeed, he was familiar with the French urbanism school's method and he previously used Henri Prost's French urbanism techniques and applications in his plans (Baratucci, 2006, p. 85). Luigi Piccinato prepared a

macro-city plan for the first time expanding Istanbul city's boundaries further upto the old Istanbul city's antique city walls with the newly planned *villes-satellites* (satellite-cities) (Iller Bank, 1972) (Fig. 3). Also, as a well-known model in the world, this housing was first foreseen specifically in Istanbul by French architect-planner Henri Prost in his 10 Years Master Plans for Istanbul and a version of this model was originally transferred from French *villes-satellites* (satellite-cities). Later, this housing was designed and was

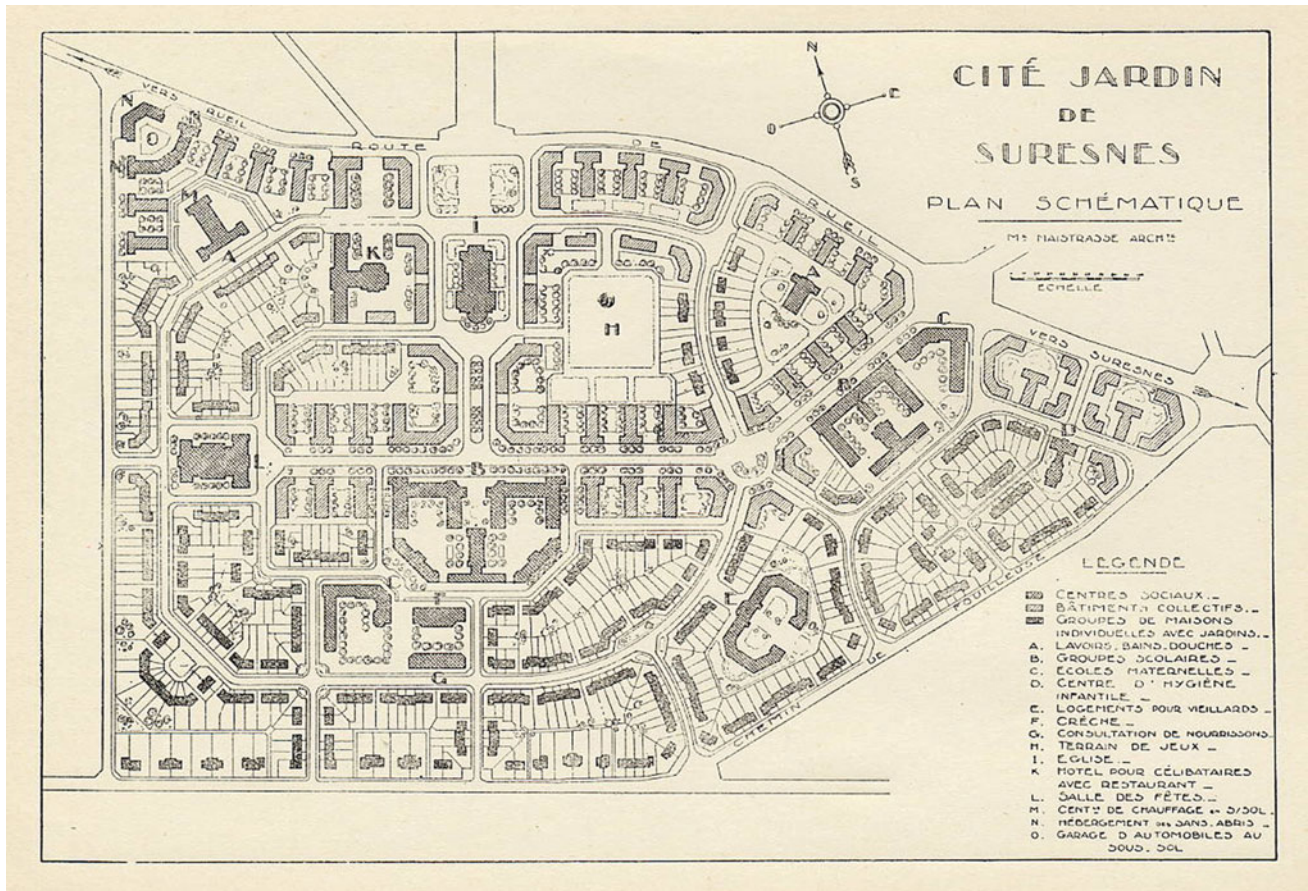
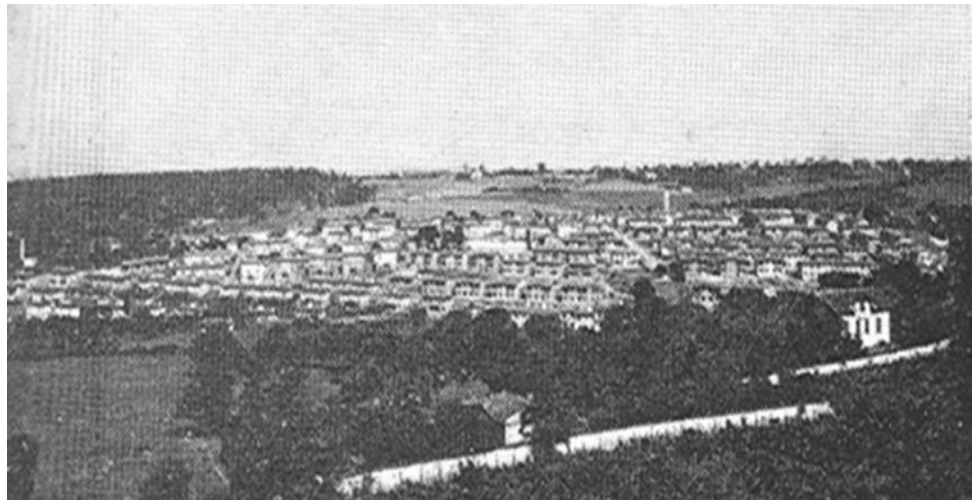


Fig. 7 *Cité-jardin*, (Garden-city), Paris, planned by French planner Henri Sellier. (Right), Post-Prost period the “Garden-city” project planned according to H. Prost’s Anatolian Side*Côté d’Asie* Project.

Kadıköy district, Kosuyolu, Istanbul. Housing models designed by private constructor. Photo, Vhaber

Fig. 8 *Cité-jardin*, (Garden-city), Paris, planned by French planner Henri Sellier. (Right), Post-Prost period the “Garden-city” project planned according to H. Prost’s Anatolian Side*Côté d’Asie* Project. Kadıköy district, Kosuyolu, Istanbul. Housing models designed by private constructor. Photo, Vhaber



implemented by Italian architect Luigi Piccinato, and Turkish architect E. Menteşe in the Ataköy region on the European side, along the city’s western axis on the Marmara Sea coast (Figs. 11 and 12).

In the 1970s, the city’s development continued expanding along the two continents, European and Asian Sides, after the construction of the new Bosphorus Bridge ‘s the newly formed new urban system (Tekeli, 2013, p. 358) dividing the

Fig. 9 *Cité-Parcs*, (Park-cities) Istanbul, planned by H. Prost Uniqely for Bosphorus. Photos, (left), IFA Archives, Paris, (right), H. Coskun



Fig. 10 *Cité-Parcs*, (Park-cities) Istanbul, planned by H. Prost Uniqely for Bosphorus. Photos, (left), IFA Archives, Paris, (right), H. Coskun



city to the business area on the European Side and residential areas mostly settled on the Asian Side. Enhanced to transportation network the new Bridge led to newly opened

residential areas “garden-cities” in the Anatolian Side called *banlieues* (the suburbs) planned in previously unreachable green areas along the new railway in the city’s east–west

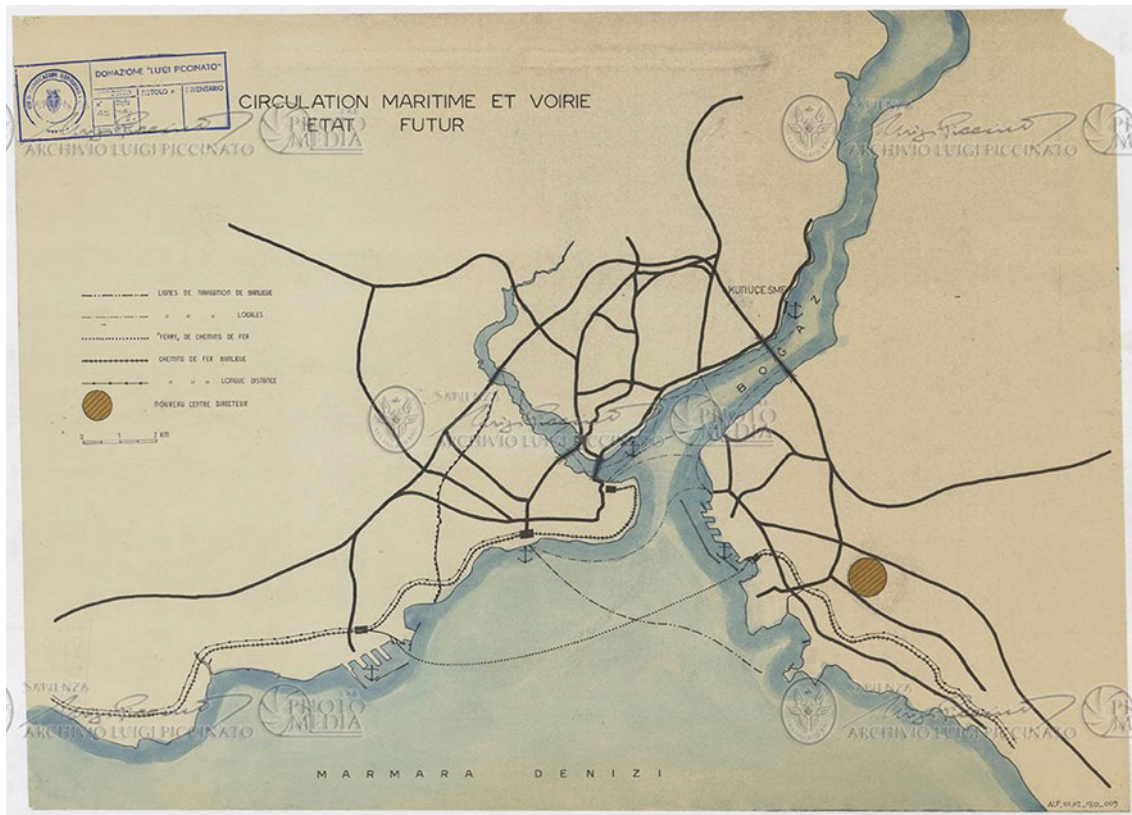


Fig. 11 *Villes-Satellites* (Satellit-cities), in Ataköy District, planned by Luigi Piccinato, and E. Mentеше. Map, Archivio Luigi Piccinato, Universita Roma La Sapienza, www.luigipiccinato.it

axis. After the 1970s-80 s, the housing problems of Istanbul first started with massive inner migrations, induced by industrialization in the big cities, and it continued with later external migrations.

- **In 1990–2000s, The Modern Garden-City Plannings In Istanbul**

In the late 1990s-2000s, new versions of old “garden-cities” transferred directly from England started to be rebuilt in the empty and green areas of Istanbul’s countryside and rural areas. As the model of the modern “garden-city” settlements were specially planned in the northern axis of Istanbul city in the countryside and green areas were evoking the English country-style life. In the 2000s, these were seen as some exemplary settlements as recent modern versions of the old English “garden-city” models in Istanbul.

Indeed, as the first original model of the “garden-cities” in the world, E. Howard’s plans first appeared in England in the early twentieth century and still arouse interest (Fig. 10). Thus, in the 1990–2000s, some derivatives of an early model of these old English “garden-cities” were implemented in the far northern axis of the Istanbul city in the regions: of

Kemberburgaz, Zekeriyaköy, Sarıyer (Figs. 13 and 14). These were known as countryside theme housing such as; Kemer Country, İstanbul & İstanbul, AlarkoAlkent, etc. Also on the Anatolian side Ömerli Town project, the Beykoz project were implemented.

These projects were very modern and innovative plannings which were inspired by E. Howard’s English “garden-city” models. Even though, like the modern garden-city projects some innovative projects were seen as good examples that emerged in the world but, in the first years, projects could not appeal to the majority of the city’s population. However, more recently, these housing plannings which were previously described as very far from the city have become very popular, emulating a rural life especially after the pandemic.

4 Sustainable, Resilient, and Eco-City Models in the World

During the last few decades, the issue of climate change has influenced the world cities, and new city planning theories, ideologies and doctrines have emerged on the concept of sustainable urbanism related to nature, ecology, disaster, as

Fig. 12 *Villes-Satellites* (Satellit-cities), in Ataköy District, planned by Luigi Piccinato, and E. Mentese. Map, Archivio Luigi Piccinato, Università Roma La Sapienza, www.luigipiccinato.it



Fig. 13 2000s, Istanbul, Modern Garden-cities, Left, Kemer Country, Modern New Version of E. Howards garden-city. Photo, Kemer Countrywebsite. Right, Ömerli Town Project, Anatolian Side. Photo, Anonym



Fig. 14. 2000s, Istanbul, Modern Garden-cities, Left, Kemer Country, Modern New Version of E. Howards garden-city. Photo, Kemer Countrywebsite. Right, Ömerli Town Project, Anatolian Side. Photo, Anonym



well as technological development. New ideological approaches have been proposed by UN-Habitat defined by existing sustainable urban planning theories to help build a new and sustainable relationship between urban dwellers and urban space, and to increase the urban land value to support the sustainable neighborhoods making them compact, integrated, and connected (United Nations, 2021). Indeed, the concept of sustainability emerged as a connection to the compatibility between economic development and environmental protection, and it also emphasized the role of development to ensure the satisfaction of the present generation's needs as well as the future generations (Nocca, 2017, p. 2). So, therefore, the sustainability is not only related to the present but also related to the future of the city's sustainability, eco-systems and ecological cities aimed to enhance the well-being of citizens and society in the future through integrated urban planning and management that harness the benefits of ecological systems and protect and nurture these assets for the future generations (World Bank, 2014).

Included are different new urban planning theories and approaches specified by newly developed innovative models that have been added to urban planning terminology with newly added terms such as; sustainable city, resilient city, eco-cities, etc. It is possible to expand this term further by adding a smart city or digital city (Cocchia, 2014, p. 3). In this context, sustainability and resilience came to the fore primarily as climate-based ideologies. Although there are some nuances and differences in terminology, these terms are united under the same ideology as a purpose. The theory of sustainable urbanism is where the concept of sustainability was paired with ecology, nature and smart technology. On the other hand, the term resiliency signified new ideas for designing future cities which advocate a return to

small-town urban forms with a design focus emphasizing the scale of human, pedestrian-friendly streets, with an end to suburban sprawl (Beatley, 2009).

In addition to these innovative theories and ideologies, new urban models were developed and set to be planned in practice. Strategies of sustainable urbanism, therefore, focus on a variety of aspects of an urban environment, including natural ecosystem, green and open spaces, buildings, energy, transportation, infrastructure, amenities and socio-economic development of local communities (Ferdous et al., 2020, p. 4). The city and housing models developed due to climate change also various and change according to the regions and countries in the world, and the diversity of the disasters experienced is also decisive in this regard. Resilient cities were aimed to help cities adapt to a greater variety of changing conditions and withstand shocks as they grow increasingly vulnerable to natural hazards (World Bank, 2016).

The natural and ecological problems arising from climate change became significant problematic for world cities. In this context, developed as a solution to the ecological problems the eco-city concept is decisive in cities where ecological disasters are significant such as: eco-cities, sponge-cities etc. In China, or in some countries where air pollution is intense, the concept of city planning was based on pedestrian transportation and carbon neutral is more prominent. Examples included the Freiburg as the green city in Germany, Masdar City project in Abu Dhabi as zero-waste ecology, Chinese and Singaporean eco-cities, newly started project in Saudi Arabia or other versions of further examples from different countries that aim to be carbon-neutral, self-energy sufficient and ecological cities ideally as well as the regenerative planning.

• **The Recent Come-Back of Old Garden-cities in England After The Covid-19**

Recently, the old, English housing models, which were seen as innovative models in past, have come-back as new versions of old models with different labels. Developed by E. Howard, in England, at the beginning of the twentieth century, (Howard, 2008) modern versions of this model were already applied as modern “garden-cities”, particularly in the northern part of the city of Istanbul, from the end of the twentieth century (Coskun, 2020b). Although, in the 1990s, aiming at English country-style rural living style the purpose of planning this model in Istanbul did not fully coincide with the concepts of a sustainable and resilient city. But, recently this old model come to the fore that could be developed in this concept with specific zoning applications and land use policy due to the prevention of green areas from urbanization and deforestation in the world and also Istanbul.

Thus, witnessed the come-back of the old, “garden-cities” were first planned in England by E. Howard recently (Banham, 1969). Especially with the effects of covid-19, people who were clustered in their homes for months demanded new lifestyles and to live in “garden-houses” in green and sunny areas. This newly emerged demand caused old “garden-cities” to make come-back and become popular again in England and also renovation of the old Welwyn city in the context of sustainability. In England, the post-war concept of “garden-cities” has been re-engineered into a modern solution to the housing crises. Deputy Prime Minister Nick Clegg has pledged to develop a string of new garden-cities between Oxford and Cambridge and also to deliver 50.000 new homes by building 10 gardens (Maltby, 2014).

Furthermore, according to some theorists, a widespread idea has come to the fore in recent years that the sustainable and resilient cities originated from models from the past. The many innovative models and model cities, such as new “garden-cities” especially derived from the old “garden-city” models, which emerged as new housing models from the beginning of the twentieth century (Lehmann, 2011, p. 3). In the first half of the nineteenth century, the Garden City of Ebenezer Howard, the urbanistic thought of Frank Lloyd Wright, and Le Corbusier laid the foundations for a radical change of paradigm and a comprehensive transformation in the urban planning canon, and during the post-war era, there was the spread of modernist tower blocks to satisfy the needs of urban slums (Rapoport, 2014).

Although, the problems of cities in the context of climate change came to the forefront throughout the world, the priority of the city of Istanbul draws attention as other natural disasters make it an earthquake-prone city. Even though a large-scale regeneration project started throughout the city

after the recent earthquake in 1999, these projects were implemented in the context of sustainable and resilient city planning that was a fairly new issue for Istanbul as a mega-city according to UN norms (United Nations, 2014). In this regard multiple examples in the world could be seen; London, Paris, Lyon, etc. Also, the other significant problem in cities was the rapid urbanization and urban sprawl particularly emerged toward the forest areas and green areas. While the cities where green areas are reduced and deforestation was seen searching for the more healthy living style garden-city themed city designs became an important land use planning by integrating nature into the urban design (Beatley, 1987). The paper also reviewed examination on new housing models and typologies in this context.

According to UN, In supporting sustainable neighborhoods, the Five Principles seek to:

- Promote high rise and density urban growth, alleviate urban sprawl and maximize land efficiency.
- Promote sustainable, resilient, diversified, socially equal communities.
- Promote sustainable, resilient, diversified, socially equal communities.
- Foster local employment, local production and local consumption.
- Provide a variety of lot sizes and housing types to cater for the
- diverse housing needs of the community.

4.1 The New and Innovative Projects for Istanbul: Sustainable Housing Models and Housing Typologies After the Covid-19

In the post-pandemic period, after the Covid-19, people’s demand for housing radically changed and interest in housing in green areas started to increase gradually, and it became a necessity to make controlled planned areas with specifically arranged zoning planning optimum use of these areas which were already decreasing. With the gradual decrease of green areas and the increasing potential as an investment for wealth accumulation, it is in the interest of speculators and with the desire of the rich to live close to nature, the urban-sprawl has already threatened green areas of the city for many years. After Covid-19, new housing projects began to plan in the city aimed to protect green areas and under the newly generated labels that matched people’s demands such as; green-houses, healthy-houses, terrace-houses, lake houses, forest houses, etc. Therefore, also in Istanbul, Turkey, due to the recently emerged changing demand of the people, especially after the

Covid-19, consideration for housing models also had to change and transform.

- **Newly Planned Sustainable, Resilient and Green Projects in Istanbul**

With the changing conditions of the Istanbul city in recent years, first, the earthquake and then especially Covid-19 caused an intense change in housing demand, models and typologies. Despite the Climate-change Conference which was also held in Istanbul in 1996, after the first Summit in Rio, (United Nations, 1992) the effects of Climate-change and global warming did not seem to have had the expected effect in Istanbul until now. However, the main factor that changed this situation was the pandemic. Until recently, the plans carried out in this context were mostly limited to the “garden-city” concept with the increase in demand for new and innovative housing models, especially after Covid-19. Thus, new and innovative housing models were started to generate, soon after the recent pandemic as well as the old, existing models which were developed in the twentieth century that recently made come-back in Istanbul.

More recently, considering the people’s post-pandemic views due to changing demand for housing models after the pandemic, *Türk İnşaatçılar Birliği* (Turkish Builders Association) was attempted to start a new construction plan declaring that they will intend to produce “sustainable friendly” projects to meet people’s altered new requirements and allocating the more money. (Trthaber, 2021) Also, Turkish private contractors explained that they concentrated on new housing ideas and a new term healthy-city concept indicator of houses with more green areas including nearly 90 per cent green areas.

In the post-pandemic period, Turkish the contractors have specified new criteria for producing new houses to produce for the future and according to newly specified features concentrating wide scale houses with the gardens, terraces or balconies. Also, they launched more horizontal buildings and “garden-cities” with more green areas instead of multi-storey concrete tall residences to create a sustainable relationship between urban dwellers and urban areas compatible with the recent declared ideas of the United Nations (United Nations, 2021). Hence, these newly emerged housing models as newly labelled housing models were developed such as; garden-cities, healthy-houses, terraced-houses, forest-houses, wood-house, lake-houses in the last remaining green areas of the city or in the areas gained through urban transformation. While the general tendency in Istanbul towards the planning of innovative housing models, were seen in the area of interest of private contractors, TOKI, a state institution, large-scale mass housing has recently altered its housing planning concept within the scope of

planning new and innovative housing projects and started to produce projects in the context of sustainability.

- **Newly Changed Housing Models and Typologies After the Covid-19**

Indeed, the Covid-19 has been a turning point for Istanbul, with the change in the demands of the people in housing models, it has now become a necessity to make changes in housing plans. Thus, new and innovative housing models were increased that have begun to generate after the recent pandemic as well as the old, existing models which were developed in the twentieth century that recently made come-back in Istanbul. Furthermore, architects had to change and re-arrange housing plans after the Covid-19 where the housing models and typologies altered and started to plan houses with an additional small working room that has emerged as a necessity that should be in every residence. With the final arrangements the new housing models aimed to plan as 1.5, 2.5 or 3.5 rooms, the room half signifying the working areas, after Covid-19, that has emerged as a necessity in every residence.

- **The Eco-Cities Planned For Istanbul Recently**

The term eco-city originated from Richard Register in his 1987, book *Eco-city Berkeley: Building cities for a healthy future* (Register, 1987). The eco-cities were based on the environment including the main characteristics of healthy, self-sustaining natural eco-systems and living organisms. Also, an eco-city could be planned as a part of a possible close or a cluster of eco-cities, or within the close network of eco-region systems. In an eco-city, people’s lifestyle would have a less planetary impact and its social order would follow principles of fairness, justice, and reasonable equity (promotion of culture, capacity building, education, equitable economy, and quality of life) (Eco-city Builders, 2011).

The eco-cities were planned in climatic conditions of the different locations or geographies in the world and in the countries as different versions that changed according to the countries they were in as Chinese eco-cities or Sino Singaporean eco-cities, etc. Eco-cities transformed from building sustainable cities for all to a means of legitimizing technology-based strategies to justify urbanization and economic growth. Its key objectives are: to provide healthy abundance to its residents (walkable access to basic urban services; public transit; healthy and accessible local food production); not to consume resources that it produces (conservation of energy and non-renewable resources, renewable sources of energy; recycling resources); not to produce more waste than it can assimilate (clean air, water,

soil, and energy); not to be toxic to itself or nearby ecosystems (biodiversity conservation).

In the past decades, having various eco-city examples, China dedicated attempts to develop and plan significant eco-cities worldwide. So, the Chinese government allocated its economic resources widely channeling into building sustainable cities, and eco-cities projects. In China, eco-cities are built by consortiums often involve multiple stakeholders from both the public and private sectors. Also, these consortiums may contain local and foreign government partners in addition to numerous others, local supporting businesses, local communities, and nongovernmental organizations, all with different social and environmental agendas. (Mullins, 2018, p. 33). By the year 2015, China was leading in design and construction in more than a hundred cities which were planned to be transformed into eco-cities and more than 250 to be eco-city or low-carbon cities (Caprotti et al., 2015).

These systems in eco-cities depend on the optimum use of domestic water as well as the conversion of sea water to drinking water, similar to the Tianjin example in China. But for Istanbul, the problem in Küçükçekmece eco-city is more prominent due to the excessive urbanization around the lake, and the pollution and dangers it creates. Tianjin is facing water scarcity, and the Municipality Ecological City Development has adopted new regulations to force water conservation, water-saving technologies in seawater desalination, wastewater treatment, water reuse, and flood and storm management (World Bank, 2009).

The planning concepts such as “eco-city”, “sustainable city” and “resilient city” have emerged as solutions to the rapidly increasing problems of cities with the development of urban planning techniques after the 1980s. Ken Yeang's Küçükçekmece planning proposal, located on the western axis of Istanbul in the early 2000s, was seen as a remarkable project as the first “eco-city” planning for Istanbul at that time (Coskun, 2021a). As a significant model-example in Istanbul city, Küçükçekmece project was planned by Ken Yeang as a pioneering project that aimed to preserve the existing K. Çekmece lake natural “eco-system” having problems with urbanization (Yeang, 2009, 2010).

Küçükçekmece lake was placed in the far western axis of the city where the Marmara Sea and the lake connected creating a natural “eco-system” which was already impacted by heavy urbanization. The project aimed to save natural surroundings and to create a convenient natural place again would be the main purpose for Ken Yeang's project. As the widespread trend has been observed in the growing number of “eco-cities” developed over the past two decades that claim to combat our current global climate-change challenges, similar to the Küçükçekmece project (Coskun, 2021b). So many of these cities are found to be established

in isolation from other existing urban centers due to the nature of their ownership (Eco-cities, 2021). Although it was a model-example project in this context, Ken Yeang's Küçükçekmece project could not be implemented due to some bureaucratic obstacles.

• Regeneration Projects Planned in the Context of the Green Projects

In the 2000s, the Kartal project competition was won by Zaha Hadid, to be implemented as a large-scale urban regeneration project that extended the wide-area from the sea to the E5 highway in the north of the Kartal Region. This regeneration project for the Kartal Region in the city was based on a very modern idea and depended on parametrical architectural design criteria that reflect her unique style (Coskun, 2020a). Although, sustainable regeneration was still a fairly new concept for Istanbul and the world, however, this project was planned as a regeneration project that did not consider sustainable aspects in accordance with recent urban planning concerns. The project possessed a visionary urban renewal project for the densely commercial, residential and industrial urban fabric or Kartal on the Asian shore of the Sea of the Marmara. Zaha Hadid's radical scheme for Kartal urban renewal introduced another theme that was likely to shape the future architectural practice in the age of globalization (Bozdogan & Akcan, 2012).

Zaha Hadid's Kartal urban regeneration project planning purpose was “a regeneration of existing industrial zone”. Since sustainable and resilient city planning concerns were not taken into account, Zaha Hadid's project was seemed to be focused more on the parametric concept instead of land use and arranging the green areas in the region. Even though the project was seen to be established on futuristic values with the innovative fluidal, parametric design technique, her approach of the housing planning appraised only the multi-story block design and houses with gardens and green areas that were not included as usual (Table 2).

5 Conclusion

The main idea of the this research was to concentrate some of the housing models specifically designed and planned for Istanbul in its history and also to re-examine them in the context of the proposal of future housing models, and presenting and updating research with accordance to the rapidly changing climatic and pandemic conditions that were of very less research.

Although the 1996 Conference of the Earth-Summit was held in Istanbul, efforts did not create enough impact in the city. And in this context, when we look at the settlement and

Table 2 Istanbul City, Housing Projects In Years, 1930–2021, Table, H. Coskun

Istanbul-housing projects in years 1930–2021	“Garden-Cities” transferred from France old model	“Satellite-Cities” old models	Gentrification projects (city centers) for upper&mid-class people	“Garden-Cities” modern versions old models transferred directly from England	Sustainability-resilincy& eco-cities, etc.
	In the Anatolian Side; Kadıköy, Acıdem, Koşuyolu,	Ataköy Region, In the western-Axis of the Istanbul	City Center: European&Anatolian Side; Zaha Hadid, KartalProject) Bagdat Street-Göztepe-Feneryolu-Suadiye, Bostancı, etc.	European Side; KemerCountry, In Anatolian Side; Beykoz Houses, ÖmerliKasaba, etc.	Out of The City Centers; (K. Çekmece, Ken Yaeng Project

housing models in Istanbul, new and innovative models that have emerged today are not sufficient in number in Istanbul.

After the 1990s–2000s, although there was not enough awareness of the planning of sustainable or resilient settlements, many new housing models as good examples have been implemented as modern versions of old “garden-cities” in the green areas of Istanbul’s developing axis in the outskirts of the city.

However, after the 1999 earthquake, as a threshold, Istanbul’s planning dynamics totally changed along with the city’s planning agenda and the city had to focus on the earthquake issue intensely that was seen as the most important problem. As an earthquake-prone country, an intensive regeneration planning has been started throughout the city. However, these new regeneration plannings were carried out in accordance with the traditional design principles, and in this context, sustainable regeneration ideals, which are seen as an innovative attitude in the world, could not apply.

After the 2000s, to design some new and innovative projects in Istanbul as well as in the world, an International competition project was opened that came to the fore in this context. Some leading architects and architectural groups from all around the world were invited to find solutions to the city’s problems. These architects and planners produced considerable innovative projects particularly for the Küçükçekmece region, in the far western axis of Istanbul where the Marmara Sea and Küçükçekmece lake connected creating a natural “eco-system”. Although these projects were seen as some model-examples for Istanbul city’s natural “eco-system” they could not be implemented due to some bureaucratic obstacles.

However, after the last Earth-Summit, 2021 which was held in Glasgow, COP-26 attention was drawn to problems such as deforestation of the city that might be experienced in the near future from the Istanbul Municipality. In this context, urgent requirements for preparing some zoning plans for controlled land use plans for the use of the city’s lands and green area’s new housing settlements emerged.

Although Istanbul still continues to receive immigration and continued urban sprawl and rapid urbanization in recent years, still some good housing examples were realized in the city.

Recently, similar to the world, the Climate-change issue began to create awareness that was long-awaited in years in Istanbul. The recent Covid-19 and the maritime disaster, mucilage which was experienced in the Marmara Sea, reminded us the Climate-change that was a real phenomenon that we saw with our eyes. Also, these recent events caused us to think on the urgency about the Climate-change issue and planning of the city once again.

Moreover, it has become important to find a solution for the urban sprawl of the city when the green areas and forests about to be deplete in a rapidly urbanizing city. Thus urgent planning strategy should be started by planning controlled residential areas determined by zoning rules for the green areas that are gradually decreasing in the city.

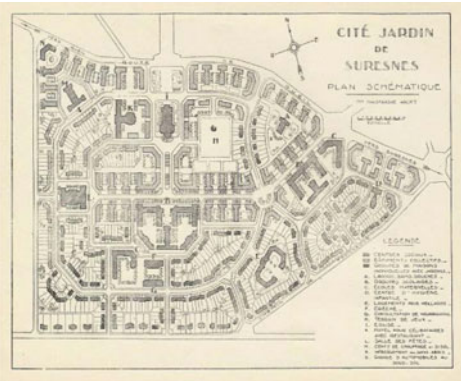





In this context, the renewal of the city of Welwyn, in England, played an important role in this research as an example of the reuse of the old, existing housing models for future planning as sustainable and resilient cities planning. In this study, the old, existing housing models such as; garden-cities, *villes-satellites* (satellite cities), *cité-parcs* (park-cities) which were developed since the early twentieth century were examined as examples of new and innovative models in the future planning of the city (Tables 2, 3, 4 and 5).

Also, in this context, reusing of old housing models came to the agenda as new and innovative models, as in the example of E. Howard’s, Welwyn city, England. Also, as well as the world in Turkey, it was seen that both the State and private contractors produced new projects with increasing awareness of the sustainable projects, especially after Covid-19. With this new approach, the name of İklim, Çevre ve Şehircilik Bakanlığı (Ministry of Environment and Urbanism), added the “Climate” and the TOKİ, as a stateside institution that started for large-scale sustainable plannings

Table 3 Istanbul, Housing Projects Applied in the Context of Sustainability & Resiliency. Table, H. Coskun

	Old garden-city versions	Satellite-cities	The earthquake regenerations	The eco-cities, etc.
The world projects	Renovation of old garden-city Welwyn, England	France, Suresnes, Drancy, etc.	London, Paris, etc.	China, Tianjin, Singaporean Eco-Cities, etc.
Design & implemented in Istanbul	Kadıköy, Acıbadem, Koşuyolu, etc.	Ataköy	Zaha Hadid Kartal Region, (Not Considered in this context)	KenYeang, Küçükçekmece Eco-City, etc.

Table 4 The old, existing housing models developed since the twentieth century in Istanbul

	Old housing models proposed to develop future models for Istanbul (newly developed projects)	
		<i>Cité-Jardins</i> French-Garden cities and their applications envisioned by French-architect-planner H. Prost and implemented by Turkish architects in Istanbul Kadıköy, Koşuyolu, Acıbadem, etc.
		English-Garden-cities: Kemer Country, Alarko, Alkent, Ömerli Town Projects, etc.
		<i>Cité-parcs</i> (Park-cities) uniquely designed for Bosphorus Height for Istanbul by H. Prost

(continued)

Table 4 (continued)

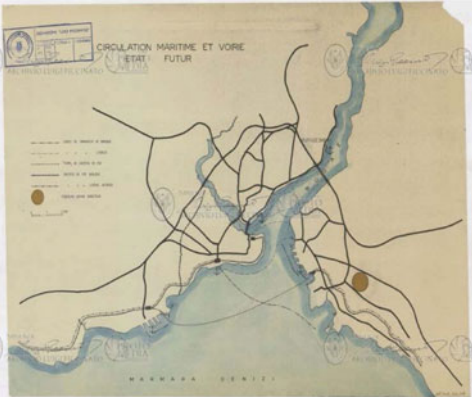



	<p>Old housing models proposed to develop future models for Istanbul (newly developed projects)</p>	
		<p><i>Cité-Satellites</i> (Satellite-cities) Envisioned by French architect-planner H. Prost Implemented by Italian Architect-planner L.Piccinato & Turkish architect E. Menteşe on the Western axis Ataköy District, Istanbul</p>

Table 5 The old, housing models (left) and their reuse as new, innovative future models (right)

	Old, existing housing models of Istanbul	Recent, future housing model proposals Istanbul
<p>Old, "Garden-City" models for sustainable and resilient cities</p>		
<p><i>Cité-Parcs</i> (Park-Cities) planned uniquely for Bosphorus, Istanbul For sustainable And resilient cities</p>		

(continued)

Table 5 (continued)

	Old, existing housing models of Istanbul	Recent, future housing model proposals Istanbul
Satellite-cities in the context of the sustainable and resilient cities first by Emlak-Bank Today by TOKI		
The eco-city proposal by Ken Yeang, Küçükçekmece District, Istanbul		
Regenerations and Large-scale projects Mass-housing Developed by banks & TOKI		

(Habertürk, 2021). Furthermore, private constructors recently explained their intention initiation on sustainable construction. It is also stated that most of these projects would be planned and designed in the context of sustainable and resilient planning.

In the post-pandemic period, recently, many significant projects came to the fore and in the context of sustainable planning private contractors produced newly labelled projects after Covid-19, by the newly altered demand of people living in green areas and in healthy, airy and sun-drenched residences such as; healthy-houses, terraced-houses, wood-houses, forst-house, lake-houses, etc.

However, it has been observed that very few of the models in the world might be used due to the fact that they are new housing models produced to specific to cities according to their unique characteristics like climate and examples such as; Masdar City project in Abu Dhabi, Chinese and Singaporean eco-cities, etc.

On conclusion, according to the findings of this study, it was achieved and proven that many of these newly planned housing projects and models were derivatives or resemblance of old “garden-city” models which were previously used in Istanbul and also propose reuse to develop future housing models and typologies.

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