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# KUY-E NARMAK: A RESILIENT HERITAGE OF MODERN HOUSING IN TEHRAN, IRAN

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As part of the Iranian national development programme during the 1950s, the local architects collaborated with the government to develop the first affordable housing project in Iran, known as Narmak. For constructing this neighbourhood, the architects were inspired by the ideas discussed in the CIAM IV, and they integrated them with the local architecture. Although the project was aimed at accommodating 7,500 families, about 90,000 families live there, at present. Considering this increase in the population density, surprisingly, the urban structure of Narmak has remained unchanged, and there is still a strong sense of belonging among the residents. Therefore, this paper unfolds how the architects of Narmak addressed the local culture and society, and through which processes this resilient urban form was created.

#### **Keywords**

affordable housing, resilient urban form, vernacular modernism, population density,

#### **How to Cite**

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## INTRODUCTION

Similar to many Middle-Eastern countries after the Second World War, Iran underwent a process of modernisation which was different from that of its neighbouring countries. For creating a modern nation that made Iran part of the civilized world, the government diffused the notion of modern living through mass housing construction, largely carried out by European-trained Iranian architects.<sup>1</sup> Creating cross-cultural exchanges, they played the mediator role between the International Style and the Iranian culture. Contrary to the colonised countries in the middle-east, such as Iraq, Saudi Arabia, Emirates and so forth that were mostly laboratories for western architects, the Iranian architects had the possibilities to develop their own practices that led to the construction of 400-housing units, between 1946 and 1948 in Tehran. Through the design and realisation of mass housing projects, they helped the Iranian government to pursue the objectives of the development plans.

Along with globalisation, the Iranian Plan Organisation prepared a series of development plans, in which public housing for the middle- and low-income families held a prominent place. Each planning was a reflection of national and international socio-political and economic conditions of the time, and a result of rural-urban migration and the demographic change in Iran.<sup>2</sup> To respond to the rapid urbanisation and growth of population density in the cities, 'The First Development Plan' (1948-1955) addressed the need for constructing affordable housing, through allocating land beyond the borders of the main cities<sup>3</sup> and providing mortgage with a low-rate interest.<sup>4</sup>

To achieve these objectives, the government established a new financial organisation named *Bank-e Sakhtemani*<sup>5</sup>, in 1952. This organisation collaborated with the Association of Iranian Architect Diploma (AIAD)<sup>6</sup>, to prepare master plans for new housing projects. Accordingly, a series of housing projects was realised such as Kuy-e Narmak (1952-58), Kuy-e Nazi-Abad (1952-54), and Tehran Pars (1958-72), among which Kuy-e Narmak played a distinctive role. On the one hand, Narmak was the first attempt of the AIAD for designing a large-scale housing project.<sup>7</sup> For them, this was an opportunity to employ modernist ideas discussed in post-war conferences such as the UIA and CIAM,<sup>8</sup> and integrate those ideas with the local architecture.<sup>9</sup> In doing so, they intended to install and practise a vernacular modernism. According to historians Bernd Huppau and Maiken Umbach, the concept of vernacular modernism emphasises 'place particularism' for preserving identity in the globalisation process.<sup>10</sup> On the other hand, this project aimed at accommodating 25,000 people; yet, it houses approximately 340,000 residents at present. Considering changing urban policies and economic conditions, individual low-rise houses have been transformed into mid-rise apartments, and ironically, the urban form and the public spaces have remained unchanged. Furthermore, despite these changes, there is still a strong collective identity and sense of belonging among the residents of Narmak.<sup>11</sup> These characteristics may define Narmak as a resilient urban form that has the ability to cope with changes, and simultaneously preserve an identity of place.

In recent years, the concept of resilience has become a source of inspiration for urban development. This concept was firstly introduced by Crawford Holling, to investigate the interacting populations and their functional responses in ecological studies.<sup>12</sup> He describes resilience as "the system to absorb the disturbances between efficiency and persistence, constantly and change, predictability and unpredictability, in order to keep equilibrium continuously".<sup>13</sup> Describing the models of change, this conceptual framework gradually influenced the other fields such as engineering, business studies, psychology, social science and urban planning. For instance, to discuss the resilience of society to climate change, Peter Timmerman established a link between this concept and vulnerability, where he defined resilience as the capacity of a system to absorb a hazardous event after happening.<sup>14</sup> Another example can be found in material science, where this idea refers to the elasticity of materials to resume the original shape after being stressed by internal and external forces.<sup>15</sup> However, this idea opened new discussions about urban development during the 1990s and 2000s, when neoliberalism became a form of governance.<sup>16</sup> In this model, state intervention and public spending have been reduced, while market-centred forces have become main features. Accordingly, this new economic system has influenced urban land-use and development, especially in metropolitan regions, so urban planning has become an entry point for resilient thinking.<sup>17</sup>

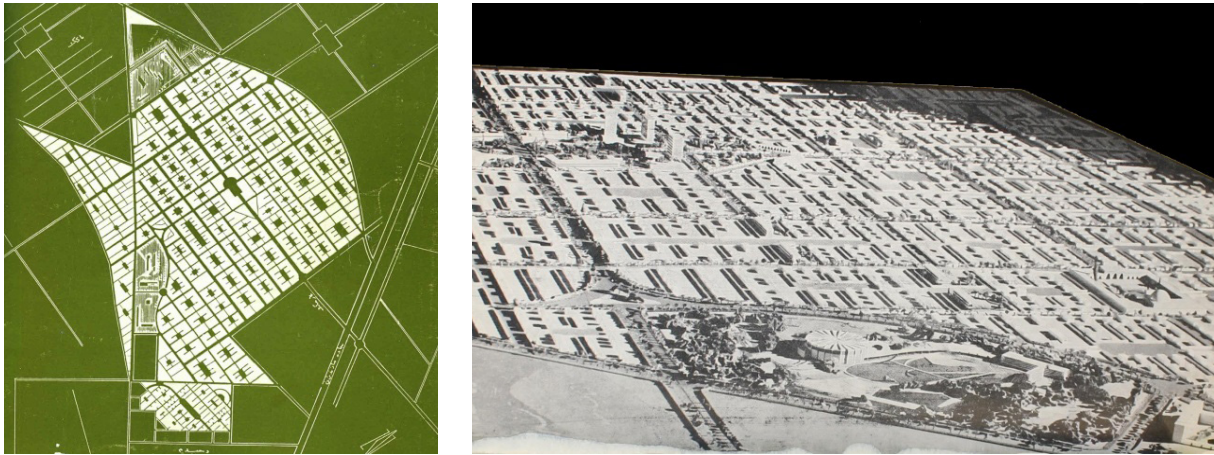


FIGURE 1 The urban layout of Narmak. The left image shows the master plan of Narmak, designed by AIAD. The right image shows a physical model made by Bank-e Sakhtemani, showing the urban squares, the park, and the boulevards.

Despite the fact that in recent studies the importance of resilience thinking in urban planning has been addressed as a tool for sustainable urban development, the ways through which relationships between affordable housing practices and the resilience concept can be achieved have been rarely studied. Therefore, by analysing Narmak's urban form and development, this paper reveals how the land-ownership system and the practices regarding 'place particularism' contributes to create a resilient urban form and a sense of belonging. Subsequently, understanding this model demonstrates whether the modernisation process through mass housing practices in a non-western country such as Iran presents a sense of continuity in the structure, meaning, character and identity of place, or generates a sense of disjuncture.

## KUY-E NARMAK<sup>18</sup>

The Iranian oil nationalisation process brought about International sanctions on the Iranian economy, mainly imposed by the British government. The Iranian government was not able to sell the crude oil, so to ease the impact of the sanction on its economy, between 1951 and 1953, the Mosaddeq<sup>19</sup> administration declared the economy without oil. To achieve this objective, they focused particularly on the agricultural activities and productions, and authorised the Ministry of Agriculture for development projects.<sup>20</sup> For constructing affordable housing, this ministry in collaboration with the Iran Insurance Company established Bank-e Sakhtemani. This bank, due to the land-price and land-speculation in the urban areas, asked the government to permit the construction of new houses outside the cities. In 1952, the parliament approved a new law, named the registration of dead-lands, through which Bank-e Skahtemani was allowed to own un-built lands, 3 kilometre far from the borders of the exiting cities defined by the municipalities.<sup>21</sup> Subsequently, a series of housing projects was proposed around Tehran, among which Kuy-e Narmak was the first one that would be constructed.

This project is designed by the AIAD and realised by Bank-e Sakhtemani, between 1952 and 1958. Situated in the North-Eastern part of and 3.5 kilometres from the old city of Tehran, Narmak was constructed on an area of 506 hectares,<sup>22</sup> in which approximately 184, 225, and 97 hectares were allocated to the squares and streets, dwelling lots, and public amenities, respectively.<sup>23</sup> The urban layout of Narmak proposed a grid including 6 main boulevards and a series of intersected lanes. This grid formed 110 blocks where in the middle of each, a public square was allocated. In the block layout, up to six dead-end alleys (east-west) were driven from each square, to divide the land into the smaller fragments forming the housing parcels. These parcels were also divided into 200 to 500 m<sup>2</sup> lots, where totally, 7,500 single-family detached houses could be constructed [Fig.01].

This urban structure was the first attempt of the AIAD to employ modernist ideas for designing a large-scale housing project in Iran.<sup>24</sup> Although low-cost housing design and development were not attractive for many highly-educated Iranian architects and private developers, for AIAD, this was an opportunity to implement their modern ideas. Before this time, some board members of the AIAD, such as Ali Sadegh<sup>25</sup>, were actively involved in CIAM discourses, and they spread their ideas among general public through a series of publications named 'Architect'.<sup>26</sup> When Bank-e Sakhtemani asked the AIAD to prepare a master plan for Narmak, they attempted to design "a modern city just outside the borders of Tehran, following the latest planning principles and modern regulations of urbanism"<sup>27</sup>, focusing on town planning. This focus might be a result of the CIAM discourses regarding the theme of 'The Functional City'. According to Kenneth Frampton, "the second stage of CIAM, lasting from 1933 to 1947, was dominated by the personality of Le Corbusier, who consciously shifted the emphasis to town planning"<sup>28</sup>. Indeed, the CIAM IV in 1933 was the most comprehensive congress from an urbanistic standpoint, resulted in the articles of the Athens Charter published in 1943.<sup>29</sup> This charter explained the conditions of towns and their rectification in four main categories as follows: Dwellings, Recreation, Working, and Transportation. Contrary to the garden city patterns which satisfied the individual, this charter emphasised the advantages of collective organisation, especially for constructing residential areas.<sup>30</sup> Furthermore, generalising principles of town planning in four distinct categories formed a condition for universal applicability of a very conception of CIAM, which was rigid functional zoning of city plans with green belts in-between, and a single type of urban housing, particularly high widely-spaced apartment blocks, wherever possible.<sup>31</sup>

To implement these ideas internationally, for instance, Le Corbusier designed the master plan of Chandigarh, in India, in 1952, and this project became a source of inspiration for many architects in countries in the region. Before designing the master plan of Narmak, the board members of the AIAD visited India in 1952.<sup>32</sup> They aimed to study modern housing experiences similar to the scale and context of Narmak. After the realisation of Narmak, some Western figures visited the project such as Edward Welz, Marcel deBuer, and Jop Benou, and surprisingly, most of them paid compliments to Narmak.<sup>33</sup>

For instance, Jop Benou who in 1955 visited and compared Chandigarh, Narmak, and a worker-housing project in Karachi, described the design of Narmak as a considerable attempt to meet the new needs of urban life, and which has relevance to the Iranian life-style.<sup>34</sup> Considering these compliments, the question is how the architects of Narmak integrated the ideas discussed about 'The Functional City' with the local architecture.

## A VERNACULAR MODERNISM

As mentioned earlier, a grid of streets made a rigid functional zoning possible in the urban layout of Narmak. In the intersection between the central north-south and west-east Boulevards, the architects placed a big plaza around which the main public buildings were located, such as three administrative towers, a municipal building, a hospital, and commercial buildings [Fig.02]. In addition, along the other main boulevards, a series of small public facilities was situated, such as shops, schools, restaurants, and tea-houses. As an exceptional form and a leisure zone in this rigid urban layout, a large park was designed on the west side of Narmak, where iconic buildings were placed such as the Museum of Modern Art, a cinema, and a sport hall [Fig.02].

Furthermore, a French prefabricated system named KALAD<sup>35</sup> was proposed, to construct similar houses, approximately 70 units in each urban block [Fig.03]. This system was not only a technique for housing standardisation, but also a "representative of the beautiful and affordable modern house"<sup>36</sup>. However, only 370 units were constructed with this system, and the architects chose to deal with the local materials.

Seemingly, the architects of Narmak tried to integrate the modernist ideas with the local architecture, through an eclectic process. According to Randy David, this process designates the conscious and selective adaptation of

vernacular and indigenous elements from the local culture in order to lend a touch of familiarity to something which is brought in from outside.<sup>37</sup> In this regard, the architects of Narmak, firstly, integrated the archetypal elements of the Persian garden with the grid of streets, to resemble the *Chaharbagh*<sup>38</sup> of Isfahan.<sup>39</sup> As an urban planning tool for the extension of the old city beyond its walls, the first large-scale application of Chaharbagh took place in the 17<sup>th</sup> century Safavid Isfahan.<sup>40</sup> In this plan, Chaharbagh was transformed to a linear garden where garden palaces, rows of trees, and water channels flanked an urban garden forming an avenue [Fig.04].<sup>41</sup> This was a new interpretation of the Persian garden where Chaharbagh acted as the main street that connected the old and new neighbourhoods.

Secondly, the architects of Narmak placed a small square (*Meydan*)<sup>42</sup> in the middle of each urban block, embedding a garden. This formed a place where children can safely play outside, and people can gather and meet [Fig.04].<sup>43</sup> According to Mohamad Beheshti,<sup>44</sup> a representative characteristic of the Persian garden is the life inside the garden, because the garden creates a place for joy, happiness, and encounter.<sup>45</sup> Accordingly, it seems that integrating gardens with the urban structure and the every-day life of people was an attempt to address the local culture and society.

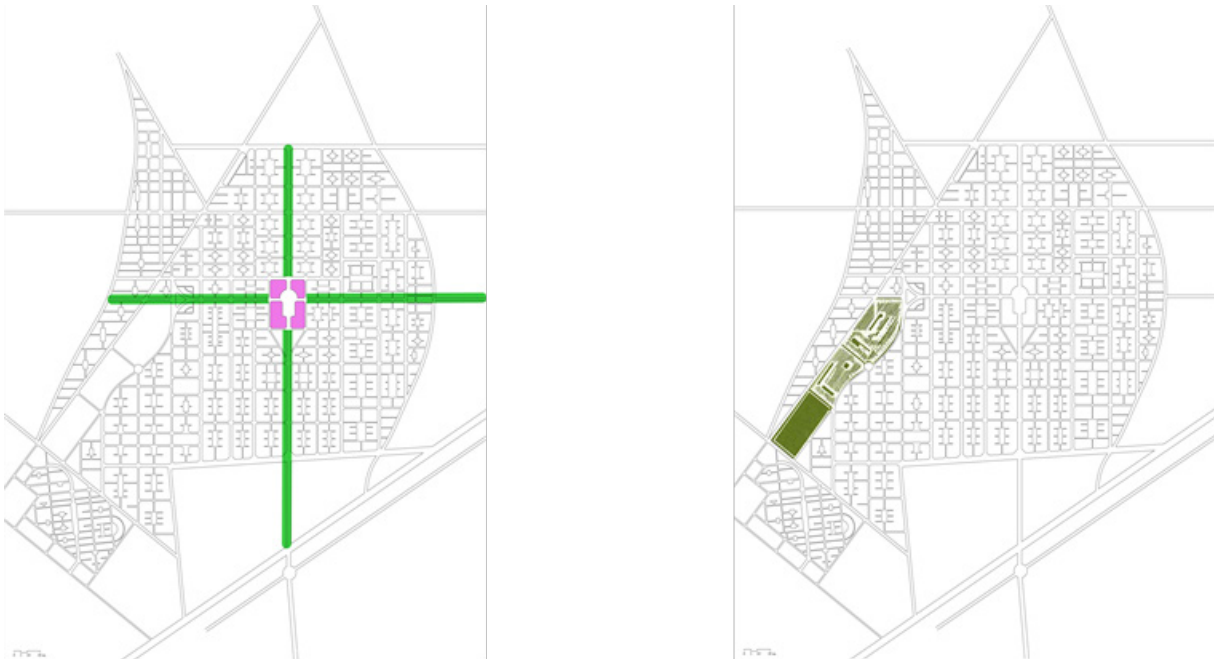


FIGURE 2 the Main Square and park in Narmak . The left image shows the main urban square highlighted with red colour, where two green axes indicating the main boulevards intersect one another. The right image shows the park in Narmak, indicated with green colour.



FIGURE 3 KALAD system. The left image shows the panels used for prefabrication in Narmak. The right image shows some houses constructed with this system in Narmak.

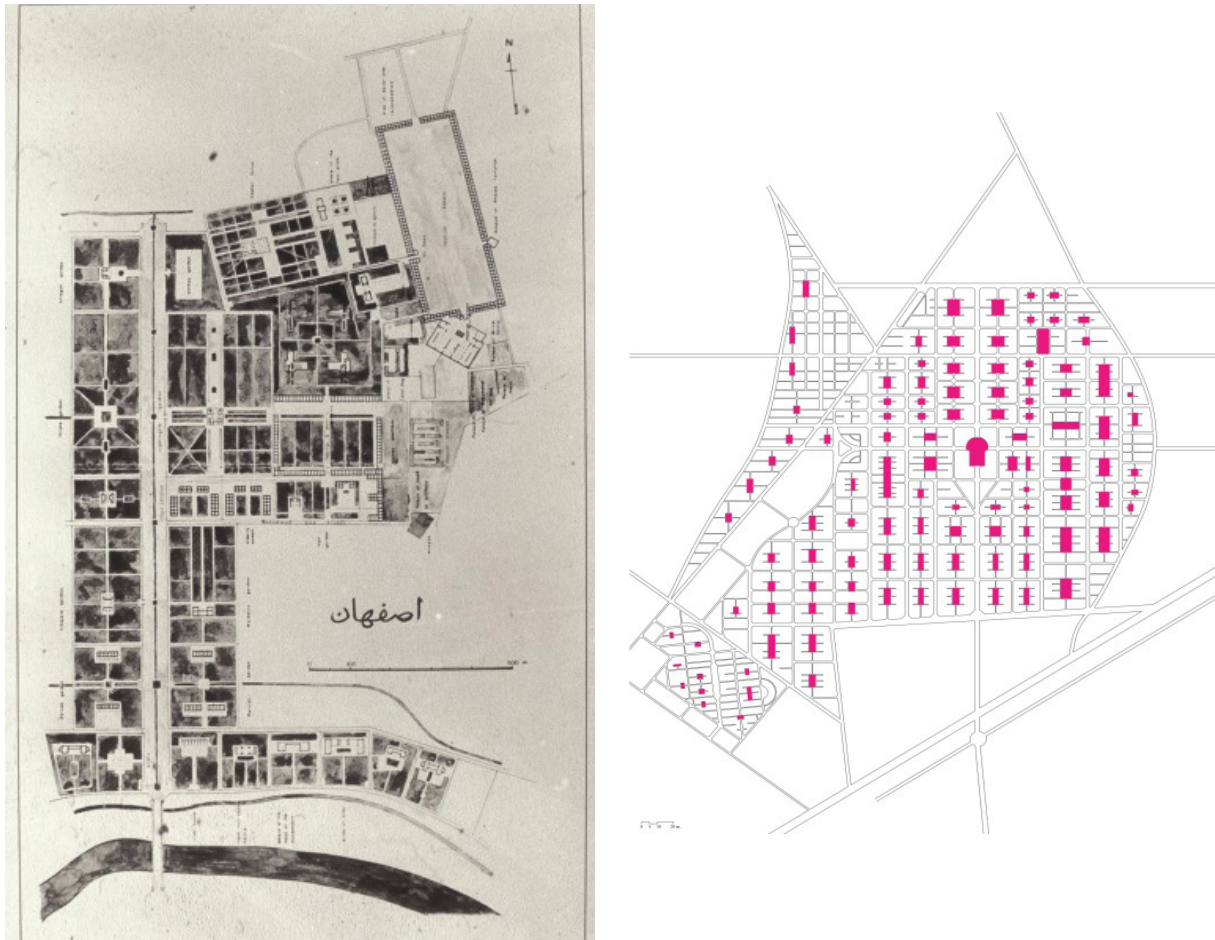


FIGURE 4 Chaharbagh & Gardens. The left image shows the 17th century urban extension of Isfahan, where a linear garden formed the urbanised Chaharbagh to connect the old and new neighbourhoods. The right image shows the collective squares embedding gardens in Narmak.

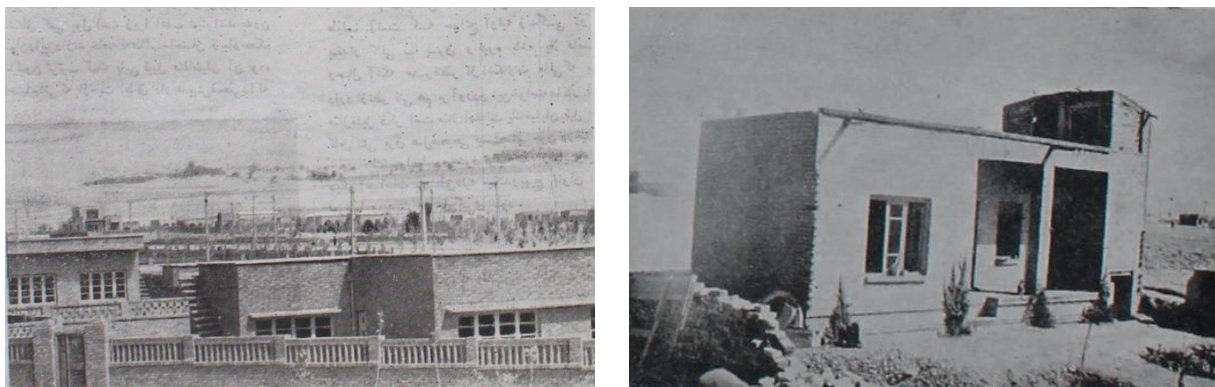


FIGURE 5 the individual houses in Narmak. The left image shows the sample houses constructed by Bank-e Sakhtemani. The right image shows a typical house constructed by people in Narmak.

Finally, for designing individual houses with KALAD system, the architects used one-story detached houses in three typologies of two, three, and four bedrooms. These houses were positioned freely on the lots, and each lot was surrounded by walls, with about 2-meter height, to form a *hayat*.<sup>46</sup> However, due to the high cost of construction and inaccessibility to the sufficient materials and techniques for the mass production, only few houses with this system were constructed.

To speed up the process of construction, the architects realised a few samples of these house types with a mix of load-bearing brick walls and steel skeleton. This helped architects to show people how new housing types could be built by local materials, and to propose two choices for the housing construction.<sup>47</sup> Accordingly, people could either order a desired type to Bank-e Sakhtemani, or build their houses with the technical supervision of the Bank.<sup>48</sup> Although some chose the first option, the majority of people selected to build their own houses, which gave birth to what Umbach and Huppaufl called “the heterogeneity and the polarity of modern experiences, as well as concrete praxis in [a] particular place”<sup>49</sup> [Fig.05].

For constructing their houses, the people asked local/traditional builders, known as Mi'mar. Traditionally, Mi'mars used the principles of courtyard houses and modified them to different plot shape and size for constructing individual houses. This was a gradual process; however, in Narmak, for the first time, they faced with the task of mass construction, in a short time. To deal with this issue, firstly, Mi'mars formed informal agencies together with the immigrants who came to Tehran to work in construction-related fields.<sup>50</sup> After visiting the sample models, they offered owners one or two-story houses with a small front and back yard, within the walled plot. Although the original design of houses proposed labels to rooms for specific functions such as living room and sleeping room, the Mi'mars neutralised the specific function of each room by constructing semi-equal rooms that embodied the traditional multi-functional use of spaces. On the contrary, they used the white unadorned facades, rectangular outlines, wide openings, and flat roofs as it was proposed by the original design.

This process of localisation and adaptation, based on local materials and market forces, integrating traditional crafts and migrant labour capacities, seemed uninteresting to Western architects. When a French architect, Rossanne, visited Narmak in 1956, he claimed that “unfortunately this new town was not completely constructed based on the proposed master plan, and the construction permission was granted to people without controlling”<sup>51</sup>. He argued that this can destroy the beauty of the project, and lead to a terrible disaster in the future.<sup>52</sup> However, looking at the current situation, surprisingly, this so-called disaster accommodates the daily needs of its users, creating a strong local identity and sense of belonging. In this regard, the questions which can be raised are: how people were able to build and change their houses in Narmak, and how the architects predicted and dealt with possible changes in their master plan. The answers might be found in the financial model for funding, the new laws considering land-use and ownership, and the role of Bank-e Sakhtemani in the construction process.

## A RESILIENT URBAN FORM

Before the approval of the dead-land registration law, the person who resuscitates dead-land becomes the owner of the land. However, the new law enabled the government to regulate issues related to the land use, urban planning, and determination/adjustment of the land price, safeguarding more accurate and broader utilization of the land for the provision of housing. Hence, through the prepayment of land purchases, Bank-e Sakhtemani provided mortgage for the construction of new houses. This financial model, supported with the new law considering the land-use and development, made the project independent from the external investments, so Bank-e Sakhtemani was able to self-organise the project.

This capacity was also brought forward by the people who bought a plot in Narmak. These land-owners needed a financial support to realise their houses. To do so, many of them divided their land into two or three pieces, kept one lot, and sold the rest. Legally, this was possible as a result of the private ownership law, established in 1906 during Iranian Constitutional Revolution to counter the 19<sup>th</sup> century landlord.<sup>53</sup> Although a direct result of this law was the provision of financial resources for the construction, more importantly, it provided a capacity through which people could organise, control, adapt and change their living environment by themselves, reinforcing the self-organisation concept in this project [Fig.06].

Consequently, this concept, which according to Francis Heylighen is a process of internal organisation within a system without being guidance or management by an outside source, established a ground for evolutionary change, indicating resilience thinking in the planning process.<sup>54</sup> In addition, this characteristic helped the inhabitants of Narmak to preserve their identity, creating a sense of belonging to the place.

This feeling was largely affected through constructing new houses and neighbourhoods, since the start of the second industrial revolution in the early 1900s.<sup>55</sup> Before this period, in Iran, the residential neighbourhoods were constructed as autonomous zones based on ethnic or religious segregation, where juridical regulations defined their pattern;<sup>56</sup> and people were responsible for providing access to houses, preserving them and overseeing their safety.<sup>57</sup> On the contrary, Narmak, included a mixture of employees, such as the government officials and teachers, small landowners, and non-bazaar merchants with various religious and ethnic background, representing a neutralised middle-class neighbourhood.<sup>58</sup> However, Bank-e Sakhtemani let people be responsible for constructing their houses, and the bank itself focused on the realisation of public spaces such as the Chaharbaghs, Meydans, and streets.<sup>59</sup> Consequently, People constructed houses based on their own needs, and they shaped and materialised outdoor spaces such as sidewalks in front of their houses in negotiation with neighbours, forming a new social participation in the neighbourhood.

The land-ownership system in Narmak, caused a particular social identity of the owner of such property, which according to Robbie Goh depends on the construction of the image of private property.<sup>60</sup> This created a sense of liberty for the inhabitants permitted by the general justifications of property rights, and a willing for participation in the state initiated development programme.<sup>61</sup> In addition, in Narmak, the land-ownership system provided a capacity for transformability/adaptability, which is the opportunity for self-organisation, although the urban structure remained intact and absorbed changes.<sup>62</sup> In short, it might be argued that these characteristics represent Narmak as a resilient urban form, where the top-down development benefited from a bottom-up participatory process in the construction and development through time, facilitating a concrete praxis that led to a vernacular modernism.



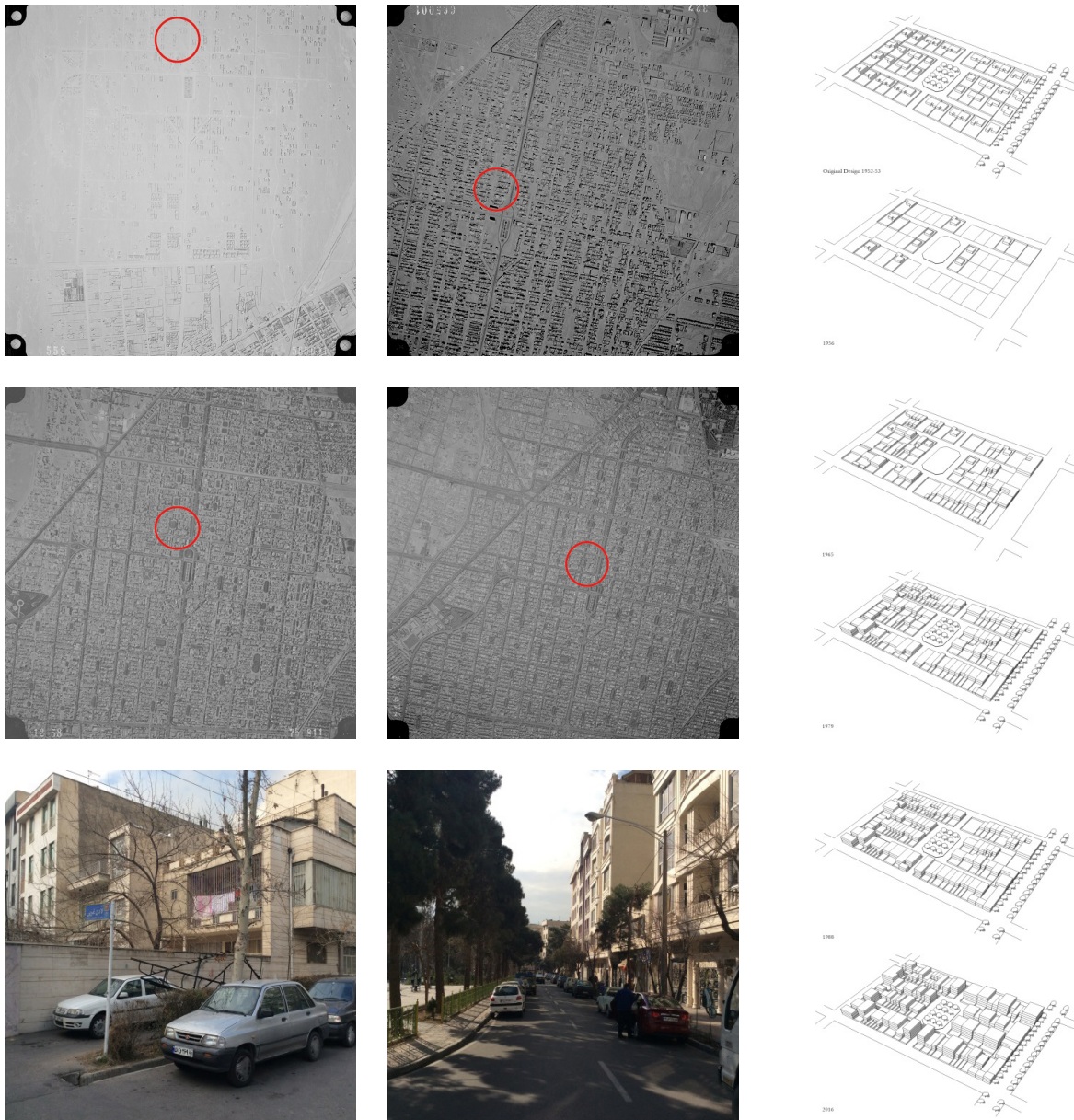


FIGURE 6 The evaluation of Narmak. Considering the central square as the point of departure for the comparison, the left-up image shows Narmak in 1956. The right-up image shows Narmak in 1965. The left-bottom image shows Narmak in 1979. And the right-bottom image shows Narmak in 1988. The situation of Narmak in 2016 is also illustrated in the last two images. In addition, in the right column, a series of analytical drawings indicates the evaluation of the red-spot from the original design to the current situation.

## CONCLUSION

Comparing Narmak with the other neighbourhoods constructed for middle- and low-income families between 1940 and 1960 in Tehran, there is a strong collective identity and sense of belonging among its residents. Seemingly, the characteristics of Narmak, as a resilient urban form, have a substantial impact on creating this feeling. These features, according to Erydin and Tasan-Kok, are “(1) the ability of a system to absorb or buffer disturbances and still maintain its core attributes, (2) the ability of the system to self-organise, and (3) the capacity for learning and adaptation in the context of change”<sup>63</sup>. During the past 50 years, this urban form, as a system, was able to absorb and cope with changes, despite the instable political and economic conditions in Iran, the rapid growth of population density in Tehran, the considerable increase in the building density, and the radical transformation of Narmak’s skyline. This ability was mainly possible through the financial model, introduced by the bank, and the land-ownership system, regulated by the parliament, which enables Narmak to undergo a self-organisation process.

On one hand, this process refers to the bottom-up development of Narmak where the role and participation of inhabitants were essential for constructing a new neighbourhood. On the other hand, although the master plan of Narmak was a result of top-down development where through an eclectic process, the architects integrated the archetypal elements such as Chaharbagh and Meydan with their proposed scheme, these elements constituted a frame within which change could take place, and occur in a harmonious way. Without strictly determining factors, the residents realised their houses based on the habits and with the local materials, and transformed them based on their new needs. Indeed, this characteristic refers to what Pierre Bourdieu called ‘habitus’<sup>64</sup>. Furthermore, in the development process, the traditional role of inhabitants in neighbourhood, as non-elite populations, changed to an active agent of social and economic change, and the residents were able to respond to urban population growth and housing need through transforming individual houses to residential apartments, and adapting their living spaces to the new circumstances. In short, it might be argued that analysing the Narmak’s urban form and development demonstrates how the concept of modernity and the vernacular, as well as continuity and change tie together creating an alternative model of modernism that becomes a resilient heritage of modern housing in Tehran.

## Endnotes

- 1 Ervand Abrahamian, *A History of Modern Iran* (Cambridge: Cambridge University Press, 2008).
- 2 Ali Madanipour, *Tehran: The Making of a Metropolis*, World Cities Series (Chichester: John Wiley & Sons, 1998).
- 3 The main city, here, means the capital city of each province, in Iran.
- 4 Mohamad Ali Abdi, Sima Mehdizadegan, and Farzaneh Kordi, *Six Decades Housing Planning in Iran (1948-2008)* (Tehran: BHRC Publication, 2011).
- 5 In English, Bank-e Sakhtemani means the construction bank.
- 6 In Persian: Anjoman-e Architect-haye Diplom-e Iran. In 1946, a group of young Iranian architects formed this association to discuss and practise adjusting modernist idea to local architecture, and to make a distinction between traditional craftsman named Mi’mar and graduating students of universities. In this association, the senior members studied abroad under Reza Shah’s command, dispatched to Europe in 1928. However, junior members were the first generation of graduates from the Faculty of Fine Art (Honar-haye Ziba) at Tehran university in 1940. Please see: Iraj Moshiri, “Akhbar-E Anjoman [News of Association],” *Architect* 1 (1946).39
- 7 Naser Badie, “Elaal-E Peydayesh-E Kuy-Haye Taze: Yousef-Abad, Narmak, Nazi-Abad [Causes of Constrcuting New Neighbourhoods: Yousef-Abad, Narmak, Nazi-Abad],” in *Barresi-E Masael-E Ejtemae-E Shahr-E Tehran [Investigation of Social Problems of Tehran]*, ed. M Motmaeni and M Hakemi (Tehran: Tehran University Press, 1962).
- 8 UIA is an abbreviation for the International Union of Architects, which was organised for the first time in Lausanne (Switzerland), in 1948. Ali Sadegh and Iraj Moshiri participated in this conference on behalf of the AIAD. Please see: Iraj Moshiri, “Hadaf-E Ma [Our Intention],” *Architect* 1, no. 1 (1946).

- 9 Before publishing the first architecture journal in 1946, many leading Iranian architects and intellectuals published a series of articles in two influential journals named *Farangestan* and *Bank-e Rahni* journal to discuss new ideas regarding urbanism and architecture. In these articles, they acknowledged the relevance of modernism for the urban development and the design of new architectural projects. However, they emphasised that through this process, architects should address the local culture and reinterpret/upgrade the vernacular architecture: please see: Houshang Seyhoun, "Maskan Va Sabk-Haye Meli-E Memari [Housing and the National Architectural Styles]," *Bank-e Rahni Journal* 2, no. 6 (1967).
- 10 Maiken Umbach is a professor of Modern History at the Faculty of Arts at Nottingham. Bernd Hüppauf is an emeritus professor of German at New York University. In their book, named *Vernacular Modernism: Heimat, Globalization, and the Built Environment*, they questioned the concept of homogenous time by focusing on heterogeneity and the polarity of modern experiences, as well as concrete praxis (process of practicing) in particular places. Please see: Maiken Umbach and Bernd Hüppauf, *Vernacular Modernism* (California: Stanford University Press, 2005).1-23
- 11 Saleh Deldam, "The Narmak Neighbourhood," in *A documentary on Tehran's neighbourhoods*, ed. Saleh Deldam (Tehran: IRIB 5, 2011).
- 12 Crawford Stanley Holling, "Resilience and Stability of Ecological Systems," *Annual Review of Ecology and Systematics* 4 (1973).
- 13 *Ibid.*17
- 14 Peter Timmerman, "Vulnerability, Resilience and the Collapse of Society: A Review of Models and Possible Climatic Applications," *Monograph* 1 (1981).
- 15 William. D Callister, *Materials Science and Engineering: An Introduction* (Wiley, 1994).
- 16 Ayda Eraydin and Tuna Tasan-Kok, eds., *Resilience Thinking in Urban Planning*, vol. 106 (Dordrecht, Heidelberg, New York, London: Springer, 2013).2
- 17 *Resilient Thinking in Urban Planning* is the name of a book written by a group of urban planners and researchers, who have increasingly felt the inadequacy of the planning systems and policies introduced to prepare cities for the future in an increasingly neoliberalising world.
- 18 In Persian *Kuy* means the neighbourhood, and *Narmak* means the new city. Therefore, *Kuy-e Narmak* means a very large and new neighbourhood, which is comparable with a city. Please see: A. M Khodayar, "Cheguneh Kuy-E Narmak Bevojud Amad [How Narmak Neighborhood Was Created]," *Journal of Bank-e Sakhtemani* 1, no. 1 (1955).
- 19 Since the Constitutional Revolution of 1906, the king became a representative figure of the country and the prime minister who should be chosen by the parliament has the execution power. Since then, the role of the charismatic Dr. Mohamad Mosaddeq was prominent in national politics. He was best known for championing two major causes: strict constitutionalism at home and an equally strict policy of 'negative equilibrium' abroad to ensure independence from foreign domination. He denounced both the 1919 Anglo-Iranian Agreement and the 1945-1946 oil negotiations with both the Americans and Soviets. He took up the cause of oil nationalisation, demanding that the government should take over the Anglo-Iranian Oil Company. Please see: Abrahamian, *A History of Modern Iran*.
- 20 Anvar Khame-ie, *Eqtasad Bedune Naft: Ebtekar-E Bozrg-E Doctor Mosaddeq [Economy without Oil: A Big Initiative of Dr. Mosaddeq]* (Tehran: Nahid publication, 1996).
- 21 Naser Badie, "Layehe Arazi Mavat [the Law of Dead-Land]," *Journal of Bank-e Sakhtemani* 1, no. 4 (1956).19-20
- 22 This area was equal to one seventh of the then total area of Tehran.
- 23 Khodayar, "Cheguneh Kuy-E Narmak Bevojud Amad [How Narmak Neighborhood Was Created]."
- 24 Badie, "Elaal-E Peydayesh-E Kuy-Haye Taze: Yousef-Abad, Narmak, Nazi-Abad [Causes of Constrcuting New Neighbourhoods: Yousef-Abad, Narmak, Nazi-Abad]."
- 25 Ali Sadegh was the acting- and the vice-president of AIAD. He studied architecture in Austria's Academy of Fine Arts in Vienna, where he met Gabriel Guverkian, an avant-garde architect, who linked Sadegh and some other Iranian architects with Europe's pioneers of the modern movement, such as Henri Sauvage, Le Corbusier, and Robert Mallet-Stevens. Sadegh was involved in the early stages of the *Congreàs Intenationaux d'Architecture Moderne* (CIAM) where his friend, Guverkian served as its general secretary. Please see: <http://www.iranicaonline.org/articles/guevrekian>
- 26 *Architect* was the first journal of architecture in Iran, published by Iraj Moshiri, to diagnose the weaknesses of Iranian cities, and discuss the relevance of the modernism movement to the local architecture. Please see: Moshiri, "Hadaf-E Ma [Our Intention]."<sup>1</sup>
- 27 Khodayar, "Cheguneh Kuy-E Narmak Bevojud Amad [How Narmak Neighborhood Was Created]."<sup>3-5</sup>
- 28 Kenneth Frampton, *Modern Architecture: A Critical History* (London: Thames and Hudson Ltd, 1992).270-71.
- 29 *Ibid.*270-71
- 30 Eric Mumford, *The Ciam Discourse on Urbanism, 1928-1960* (Cambridge, Massachusetts and London, England The MIT Press, 2000).59-103
- 31 *Ibid.*59-103
- 32 Khodayar, "Cheguneh Kuy-E Narmak Bevojud Amad [How Narmak Neighborhood Was Created]."
- 33 Edward Welz was the chief of social affairs in the U.S. Intelligent Service, who wrote a personal letter to Naser Badie (the president of Bank-e Sakhtemani-Tehran Branch) in 5 October 1954. Marcel deBuer was a French architect who visited Narmak, 21 months after the establishment of Bank-e Sakhtemani, and he wrote a personal letter to Hamid Elahi (the head of Bank-e Sakhtemani). Jop Benou was a French professor at the department of architecture, Hanoi University, 1954, who wrote a personal letter to Naser Badie in 8 October 1954. Please see: Naser Badie, "Mokhtasari Az Chand Nameh [Summery of Some Letters]," *Journal of Bank-e Sakhtemani* 1, no. 1 (1955).37
- 34 *Ibid.*37
- 35 This prefabrication system, using concrete as the construction material, had the capacity to produce one house per day. The architects proposed one-story, semi-detached homes with a private yard and typologies of two, three, and four rooms, constructed with 1.10 x 4.40 m panels. Please see: A. M Khodayar, "Avalin Khaney-E Kalad Dar Kuy-E Narmak [the First Kalad House in Narmak]," *Bank-e Sakhtemani Journal* 1, no. 6 (1957).
- 36 *Ibid.*12
- 37 Randy David, "Multiple Modernism and Modernities," in *Non-West Modernist Past on Architecture & Modernities*, ed. S.W Lim and J.H Chang (Singapore: World Scientific Publishing Co, 2012).
- 38 *Chaharbagh* means literally a fourfold garden. It is the typical Persian garden where two broad spines of open spaces divide the garden into four pieces. In addition, a small pool or a pavilion is placed where these spines intersect.

- 39 Rana Habibi and Bruno De Meulder, "Architects and Architecture without Architects: Modernization of Iranian Housing and the Birth of a New Urban Form Narmak (Tehran, 1952)," *Cities* 45 (2015).
- 40 Somaiyeh Falahat and Mohamad Reza Shirazi, "New Urban Developments in Safavid Isfahan Continuity or Disjuncture?," *Planning Perspectives* 27, no. 4 (2012).
- 41 George Nathaniel Curzon, *Persia and Persian Question* vol. I (London: Longmans, Green & Co, 1892).
- 42 Traditionally, Meydan is a collective enclosed domain, where in the middle, a garden is embedded.
- 43 Khodayar, "Cheguneh Kuy-E Narmak Bevojud Amad [How Narmak Neighborhood Was Created]."<sup>7</sup>
- 44 Seyed Mohamad Beheshti is an Iranian philosopher, scholar, landscape designer, and a scientific board member of the Iranian Heritage organization, who extensively investigated the characteristics of the Persian garden.
- 45 Seyed Mohamad Beheshti, "Jahan Bagh-E Irani [the World of the Persian Garden]," *Golestan-e Honar* 11 (2008).
- 46 Hayat means literally an enclosed yard with a small garden including trees and flowers and brick paving in geometric patterns around a small central pool of water. Sleeping outdoor in the hayat was customary in the warmer seasons, in Iran. And the yard was used as an outdoor room.
- 47 Naser Badie, "Taghsim-E Zamin Alaj-E Bikhanevani Nist [Land Distribution Is Not the Solution of Homelessness]," *Journal of Bank-e Sakhtemani* 1, no. 2 (1955):31-34
- 48 To avoid construction of houses with improper material, Banke Sakhtemani provide a material mortgage for whom wanted to build their own houses. Through a technical supervision, the architects wanted to address the needs for sanitation, tap/drink water, and drainage/insulation. Please see: *ibid.*:31-34
- 49 Umbach and Huppau, *Vernacular Modernism*:1-23
- 50 Habibi and De Meulder, "Architects and Architecture without Architects: Modernization of Iranian Housing and the Birth of a New Urban Form Narmak (Tehran, 1952)."
- 51 Abbas Adjadi, "Nokati Ke Dar Tarh-Haye Kuy-E Narmak Va Nazi-Abad Ra'yat Shodeh Ast [the Points Taken into Consideration in Narmak and Nazi-Abad Proposal]," *Journal of Bank-e Sakhtemani* 1, no. 4 (1956):22
- 52 *Ibid.*:22
- 53 Seyed Mohsen Habibi, *Az Shar Ta Shahr: Tahlili Tarikhi Az Mafhum-E Shahr Va Sima-Ye Kalbudi-E an Tafakkur Va Taassur [De La Cite a La Ville-Analyse Historique De La Conception Urbaine Et Son Aspect Physique]* (Tehran: University of Tehran Press, 1999).
- 54 Ayda Eraydin, "Resilience Thinking for Planning," in *Resilience Thinking in Urban Planning*, ed. Ayda Eraydin and Tuna Tasan-Kok (Dordrecht, Heidelberg, New York, London: Springer, 2013):28
- 55 According to Peter Rowe, this was a period for "a restricting of industries in search of economies of scale, rather than a resizing", through which the modernisation was focused on time-management, efficiency, and mass production. In this process, the modern city was a tool to improve transportation against overcrowding, and to house a new worker-type, named employee (the white collar-worker), for the management and service sectors. As a result, cities started growing with decentralised patterns of settlement and suburbanisation. Please see: Peter. G. Rowe, *Modernity and Housing* (Cambridge and London: The MIT Press, 1993):8-9
- 56 Falahat and Shirazi, "New Urban Developments in Safavid Isfahan Continuity or Disjuncture?."
- 57 *Ibid.*
- 58 According to Abrahamian, in the new development caused by modernisation, "the old neighbourhood structure, based on sect identities, had withered away; the new districts were, instead, based on class, income, and occupation". Please see: Abrahamian, *A History of Modern Iran*:120
- 59 Khodayar, "Cheguneh Kuy-E Narmak Bevojud Amad [How Narmak Neighborhood Was Created]."<sup>5</sup>
- 60 Robbie B. H. Goh, *Contours of Culture: Space and Social Difference in Singapore* (Hong Kong University Press, 2005):151
- 61 The freedom of entry and exit and the competition between buyers and sellers ensures the liberty of persons. Please see: *ibid.*:145
- 62 Francis Heylighen, *The Science of Self-Organisation and Adaptivity* (Free University of Brussels: Center "Leo Apostel", 2002).
- 63 Eraydin and Tasan-Kok, *Resilience Thinking in Urban Planning*:6
- 64 Pierre Bourdieu, who was inspired from the work of the art historian Erwin Panofsky, defined habitus as a "system of durable, transposable dispositions, structured structures predisposed to function as structuring structures, that is, as principles which generate and organise practices and representations that can be objectively adapted to their outcomes without presupposing a conscious aiming at ends or an express mastery of the operations necessary in order to attain them. Please see: Pierre Bourdieu, *The Logic of Practice* (Stanford, California: Stanford University Press 1990):53

## Bibliography

- Abdi, Mohamad Ali, Sima Mehdizadegan, and Farzaneh Kordi. *Six Decades Housing Planning in Iran (1948-2008)*. Tehran: BHRC Publication, 2011.
- Abrahamian, Ervand. *A History of Modern Iran*. Cambridge: Cambridge University Press, 2008.
- Adjadi, Abbas. "Nokati Ke Dar Tarh-Haye Kuy-E Narmak Va Nazi-Abad Ra'yat Shodeh Ast [the Points Taken into Consideration in Narmak and Nazi-Abad Proposal]." *Journal of Bank-e Sakhtemani* 1, no. 4 (1956).
- Badie, Naser. "Elaal-E Peydayesh-E Kuy-Haye Taze: Yousef-Abad, Narmak, Nazi-Abad [Causes of Constrcuting New Neighbourhoods: Yousef-Abad, Narmak, Nazi-Abad]." In *Barresi-E Masael-E Ejtmaee-E Shahr-E Tehran [Investigation of Social Problems of Tehran]*, edited by M Motmaeni and M Hakemi, 210-18. Tehran: Tehran University Press, 1962.
- . "Layehe Arazi Mavat [the Law of Dead-Land]." *Journal of Bank-e Sakhtemani* 1, no. 4 (1956): 19-20.
- . "Mokhtasari Az Chand Nameh [Summery of Some Letters]." *Journal of Bank-e Sakhtemani* 1, no. 1 (1955): 37.
- . "Taghsim-E Zamin Alaj-E Bikhanevani Nist [Land Distribution Is Not the Solution of Homelessness]." *Journal of Bank-e Sakhtemani* 1, no. 2 (1955): 31-34.
- Beheshti, Seyed Mohamad. "Jahan Bagh-E Irani [the World of the Persian Garden]." *Golestan-e Honar* 11 (2008): 7-15.
- Bourdieu, Pierre. *The Logic of Practice*. Stanford, California: Stanford University Press 1990.
- Callister, William. D. *Materials Science and Engineering: An Introduction*. Wiley, 1994.
- Curzon, George Nathaniel. *Persia and Persian Question* Vol. I, London: Longmans, Green & Co, 1892.

- David, Randy. "Multiple Modernism and Modernities." In *Non-West Modernist Past on Architecture & Modernities*, edited by S.W. Lim and J.H. Chang, 181-88. Singapore: World Scientific Publishing Co, 2012.
- Deldam, Saleh. "The Narmak Neighbourhood." In *A documentary on Tehran's neighbourhoods*, edited by Saleh Deldam, 51 min. Tehran: IRIB 5, 2011.
- Eraydin, Ayda. "Resilience Thinking for Planning." In *Resilience Thinking in Urban Planning*, edited by Ayda Eraydin and Tuna Tasan-Kok, 17-38. Dordrecht, Heidelberg, New York, London: Springer, 2013.
- Eraydin, Ayda, and Tuna Tasan-Kok, eds. *Resilience Thinking in Urban Planning*. Vol. 106. Dordrecht, Heidelberg, New York, London: Springer, 2013.
- Falahat, Somaiyeh, and Mohamad Reza Shirazi. "New Urban Developments in Safavid Isfahan Continuity or Disjuncture?" *Planning Perspectives* 27, no. 4 (2012): 611-24.
- Frampton, Kenneth. *Modern Architecture: A Critical History*. London: Thames and Hudson Ltd, 1992.
- Goh, Robbie B. H. *Contours of Culture: Space and Social Difference in Singapore*. Hong Kong University Press, 2005.
- Habibi, Rana, and Bruno De Meulder. "Architects and Architecture without Architects: Modernization of Iranian Housing and the Birth of a New Urban Form Narmak (Tehran, 1952)." *Cities* 45 (2015): 29-40.
- Habibi, Seyed Mohsen. *Az Shar Ta Shahr: Tahlili Tarikhi Az Mafhum-E Shahr Va Sima-Ye Kalbudi-E an Tafakkur Va Taassur [De La Cite a La Ville-Analyse Historique De La Conception Urbaine Et Son Aspect Physique]*. Tehran: University of Tehran Press, 1999.
- Heylighen, Francis. *The Science of Self-Organisation and Adaptivity*. Free University of Brussels: Center "Leo Apostel", 2002.
- Holling, Crawford Stanley. "Resilience and Stability of Ecological Systems." *Annual Review of Ecology and Systematics* 4 (1973): 1-23.
- Khame-ie, Anvar. *Eqtesad Bedune Naft: Ebtekar-E Bozrg-E Doctor Mosaddeq [Economy without Oil: A Big Initiative of Dr. Mosaddeq]*. Tehran: Nahid publication, 1996.
- Khodayar, A. M. "Avalin Khaney-E Kalad Dar Kuy-E Narmak [the First Kalad House in Narmak]." *Bank-e Sakhtemani Journal* 1, no. 6 (1957): 10-15.
- . "Cheguneh Kuy-E Narmak Bevojud Amad [How Narmak Neighborhood Was Created]." *Journal of Bank-e Sakhtemani* 1, no. 1 (1955): 6-10.
- Madanipour, Ali. *Tehran: The Making of a Metropolis*. World Cities Series. Chichester: John Wiley & Sons, 1998.
- Moshiri, Iraj. "Akhbar-E Anjoman [News of Association]." *Architect* 1 (1946): 39.
- . "Hadaf-E Ma [Our Intention]." *Architect* 1, no. 1 (1946): 1-2.
- Mumford, Eric. *The Ciam Discourse on Urbanism, 1928-1960*. Cambridge, Massachusetts and London, England The MIT Press, 2000.
- Rowe, Peter. G. *Modernity and Housing*. Cambridge and London: The MIT Press, 1993.
- Seyhoun, Houshang. "Maskan Va Sabk-Haye Meli-E Memari [Housing and the National Architectural Styles]." *Bank-e Rahni Journal* 2, no. 6 (1967): 6-12.
- Timmerman, Peter. "Vulnerability, Resilience and the Collapse of Society: A Review of Models and Possible Climatic Applications." *Monograph* 1 (1981): 1-46.
- Umbach, Maiken, and Bernd Huppau. *Vernacular Modernism*. California: Stanford University Press, 2005.

## Image Sources

Fig.01: *Bank-e Sakhtemani Journal* 1, no. 2 (1955).

Fig.02: Author, based on the model image published in *Bank-e Sakhtemani Journal* 1, no. 2 (1955).

Fig.03: *Bank-e Sakhtemani Journal* 1, no. 6 (1956).

Fig.04: left: <http://web.mit.edu/4.611/www/L15.html>, Accessed February 2015, right: Author, based on the model image published in *Bank-e Sakhtemani Journal* 1, no. 2 (1955).

Fig.05: *Bank-e Sakhtemani Journal* 1, no. 1 (1955).

Fig.06: National Cartographic Centre, Tehran. Accessed December 2015. The last two images and the analytical drawings by the author.