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Home Building and demands of the population in Ramshar New Town

Abdol Aziz Shahraki

Department of Regional Studies, the Royal Institute of Technology, the School of Architecture and Built Environment, Stockholm, Sweden.

This paper studies the housing and town building policies. It analyzes reasons that new towns failed to achieve their strategic goals. This paper addresses the question of why the new towns are not functional. The research methods are classic linear programming, a benchmarking technique, and a case study strategy. The benchmarking procedure compares the existing urban development pattern to optimal building models. This study explores fundamental theories concerning housing and urban development, proportional to the inhabitants' requirements, lifestyles, and livelihoods. The purpose of this study is to emphasize the natural and social characteristics of each region, as well as the livelihood needs of indigenous peoples in housing and urban policies. The case study of this research uses a market analysis procedure to discover rational and optimal housing policies. Finally, this paper suggests a feasible programming model that changes the present unsuccessful ways toward improved methods of housing policies. The model predicts required urban spaces in the new towns. It recommends design procedures based on the real needs of local people. The presented model of this research has a local application, but it is also helpful for other new urban development projects everywhere.

Key words: Housing, new towns, urban planning and design, market analysis, linear programming.

INTRODUCTION

The substantial new construction projects took place everywhere after the Second World War. The enactment of housing is important for national economies as it causes major impacts in the housing market and other economic sectors. There are variations and similarities between housing markets in different countries. European countries have got rent regulations and Latin American countries, China and Russia might have some shortages in the housing policies. On the other side,

recently, many countries have developed new housing policies. As a sample Iran has planned and built new towns, but unsuccessfully! Even, the last housing policy called for Mehr (=affection) project failed dramatically. This paper studies the housing policies to see how many of the local features and requirements of the inhabitants are respected.

This study is necessary since the houses were not built based on the real needs of the inhabitants and cannot

E-mail: aa.shahraki@yahoo.com.

absorb newcomers. Further, this paper studies the reasons for the ongoing failed housing and town building plans. Our research methods are theoretical studies, a case study strategy, a market analysis, a mathematical linear programming and a benchmarking technique. Both primary and secondary sources of data have been used. All the research methods are problem-oriented. The theories related to the problem have been studied and the observation and field studies have been performed with the help of a case study. The major planning problems of the newly built environments have been examined. The case study explores the local particular features to understand the preferences of the people. The case study includes also a market analysis to project the building productions according to the market.

Our presumption is that the current housing rule does not respect the favourites of the customers and the recommendation suggested by the experts and scholars. Therefore, every new town project shall meet local requirements such as regional market demands, the regional climate condition, inhabitants' lifestyle, the culture of the community and local economic needs.

The target of this research is to suggest a practical model for the production of new homes, according to the livelihood and lifestyle of the local people. After understanding the inhabitants' priorities and preferences, a programming model will be made. The way to achieve the mentioned goal is a crucial change in the ongoing housing and town building policies. The revision is possible with the help of the knowledge-based development ideas, experiences of skilled engineers and international financial support.

The outcome of this research will be a building production model. With the help of a mathematical linear programming our model stands on particular features of the Ramshar new town. The method of benchmarking (BM) will compare the current housing activities to successful suggestions. This article is in five parts. After this introduction, theoretical studies are carried out. The third part will present the case studies. Part four is programming and results and part five will give the conclusions.

Theories on new housing and town building policies

A review of housing policies, urban spaces, and the infrastructure needed by the people of the world shows that various decisions have been made. For example, the Nordic countries have strong support programs, other advanced countries have lending policies, some developing countries have announced regulations and housing programs and in some countries, the government has no responsibility for providing housing (Heinig et al., 2016; Xu and Han, 2018; Kaplan, 2016; Quiggin, 2018; Justo and Santarcángelo, 2016; Kocaarslan et al., 2018). The review shows also that

the housing policies are under revisions, that is, Norway and Finland have abandoned the rent controls (Holmqvist and Turner, 2014). Grace reported that Canadian Federal Government's spending on infrastructure projects is expected to be more than C$180 billion over 10 years (Grace, 2013). During the 1960s-2000s, Iran's housing policy has been the implementation of big projects such as new town buildings and affordable mass apartment buildings (Seelig, 2011; Riazi and Emami, 2018). At present, Iran has no CDSs for the Iranian built environments, housing and urban infrastructure (Tilaki and Hedayati, 2015; Shahraki, 2019b). It is therefore wise for managers in each district and city to plan and design development projects based on the specific circumstances and needs of the people. The earliest modern housing and town building projects in the world have been planned and built-in countries such as the UK and the USA (Dear and Scott (2018). The new town building policy has been a key component of urban planning and management everywhere. The housing construction is made by the government, private and cooperative sectors. Meanwhile, the share of the public sector has decreased during the past decades (Raco, 2018). Like many scholars, we support the idea of the distribution of population in the new towns to provide the necessarily built environments proportional to the existing local natural resources. From a socioeconomic point of view, we consider particularly the quality of urban life. It is why people need new homes and towns with adequate water volume, urban infrastructures and services. (Omrani et al. (2019) and Sun et al. (2018) suggested the following major indicators in detail to progress the quality of life: Rich natural environments, vibrant social life, progressive urban economy, qualified homes, adequate urban services, accessible transport infrastructure networks and qualified built and natural environments. The mentioned scholars also suggested that the housing policies shall include urban life quality. Therefore, In the process of housing and urban infrastructure development, some certain indicators shall be improved. New homes, buildings and towns shall be attractive enough so that the investors will invest in the development projects. Therefore, the problem-oriented method shall be applied during the development processes. The problem-oriented method introduces the obstacles on the way of the qualified urban development. The problem-oriented method is a systematic planning way that explores the major problems in the provision of the required infrastructures and services in new housing projects. Shahraki (2017) applied the problem-oriented method to explore the difficulties related to housing and town building policies. You also agree with us that a major problem is building water shortages in new homes and cities. This deficiency is particularly acute in developing countries and regions involved in regional conflicts. Many scholars have suggested that a major problem in the new housing projects is the shortage of

natural resources, particularly water resources (Tilahun, 2019; Maurya et al., 2020; Chitsaz and Azarnivand, 2017; Shahraki, 2019a). From an engineering point of view, we focus on fair urban-land use policies and design of the buildings considering the inhabitants. The purpose shall be the standard design of adequate urban spaces for education, health care, work, sport and leisure. Our theoretical studies and field experiments show that new development methods and strategic planning for sustainable new houses and towns shall be based on the following principles:

(i) Allocation of enough space in the streets and an effective street network. Adequate areas of urban lands shall be considered for the urban and surrounding transportation (Næss et al., 2020; Austin, 2020).
(ii) A mixed use of urban lands in the sense that a considerable area of the lands, for example, up to 40% of every residential neighborhood should be measured for economic activities, education and other urban services. Many scholars have suggested the distributional planning of the urban spaces (Wu et al., 2018; Gil and Vilhelmson, 2019).
(iii) Social integration shall be a major target in the housing policies. Citizens with different socioeconomic situations and with different cultures and races shall live alongside each other. In order to realize this aim new homes and towns must be planned, designed and built in various models and sizes. Some scholars and experts such as Säumel and co-authors used this principle in the new housing and town building projects. They suggested a strategic model for the development of sustainable, liveable, and healthy cities. They introduced a conceptual framework, which included diverse forms of urban spaces (Säumel et al., 2019).
(iv) Restrictions on the use of urban lands for special groups or uses as much as possible. Hence, lands for a single function or special use should not occupy a significant percentage of the city's land when it is necessary. To fulfil this principle, see Kotulla et al. that made the city with wider groups in the urban neighborhoods (Kotulla et al., 2019).
(v) Allocating some urban land to build homes for the needy and the homeless.
(vi) Use of indigenous climate architecture, compliance with all civil engineering standards and codes for building resilient buildings and towns.

Sinha also suggested the result of improvements in the indicators of quality of life and the progress in the engineering principles outlined above give sustainable new built environments (Sinha, 2019). The planning and building of sustainable new homes and towns play a significant role in human communities and economic activities. One of the characteristics of new housing and town building should be a consumer attraction and marketing success. For this reason, indicators of quality of

life promotion and technical and engineering standards contribute to sustainable development. Thus, sustainable development is also of economic importance (Chapman and Larkham, 1999; Pardo-Bosch et al., 2019). Maurya et al. (2020) suggested that the social and ecological health of the cities aggregates the economic values of the properties too. Obviously, the sustainable development means that every city ought to be able to supply essential services for its citizens. The short required urban infrastructure stops the provision of urban services. The urban infrastructure is the physically interrelated component of a city's system, which supplies essential commodities to enhance the quality of urban life. Sullivan and Sheffrin described the importance of urban infrastructure. *"Urban infrastructure works with the efficient planning, designing, placement, building, financing, managing, and maintaining of the required structure across an individual neighborhood, settlement district of a city, town, city or the whole of a region"* (Sullivan and Sheffrin, 2003). There are also suggestions that a successful housing policy requires adequate urban infrastructures (Shahraki, 2017).

Usually urban landowners try to spend all the land on construction rather than urban infrastructure. They only think about the economic value of land and buildings by not respecting the technical standards of urban planning. Lijesen and Shestalova found the funding limitations a big problem in the urban infrastructure developments (Lijesen and Shestalova, 2007). Scholars like Borer believe that the culture and the regional tradition are other factors, which influence the attractiveness of the new towns. Therefore, when locating new sites for housing projects, paying attention to cultural attractions can encourage people to live in those homes (Borer, 2006). Although every country has a lot of cultural places and heritages, the current development policies conflict with the architectural culture. Dumouchelle learned that the built environments are duplicated and lack national and international standards and codes. The building projections do not respect the needs of the local communities. The result of such development has been the decline of the green areas versus the climate architecture principles (Dumouchelle, 2017). In fact the current development programs are declining the natural resources. As people leave the nature-based lifestyle, they damage the natural environmental components. Their buildings do not have any associations with nature (Angen, 2013). That is why a revision in the current housing and town building polices is necessary. Worse, the built environments are not resistant against natural hazards either, because they usually are built without strategic economic programs. Unfortunately, the majority of people are unemployed and the cities are usually dormitories. Several scholars suggest that the need for a multidisciplinary planning method has been voiced to resolve the mentioned problems in the new housing and town projects (Kovacic et al., 2011). Scholars like

Governa and Sampieri suggested that new towns have been built in various functional purposes such as a country's capital, industrial center, new suburb district or a residential neighborhood (Governa and Sampieri, 2020). The new towns have usually been planned to the home surplus population of the metropolitans. Therefore, the new housing and town building projects shall fulfil the socioeconomic, engineering, environmental, urban infrastructures and aesthetic requirements to attract inhabitants.

CASE STUDIES

Problems of Iran's housing policies

Major Iranian engineers, planners and scholars reported that the housing and new town building policies in Iran have not been successful (Atash and Beheshtiha, 1998; Arefian and Moeini, 2016; Annamoradnejad and Zarabi, 2011; Ghafourian and Hesari, 2018). The new housing and town building project has been unsuccessful in several perspectives such as planning, physical designing, the building of infrastructures, functionality, environmental protection and natural resources' saving (Hosseinali et al., 2015). Worse the involvement of the dominant corruption in the process of planning, building and use has been yet another fundamental problematic (Rasoolimanesh et al., 2013; Khaki and Sadat, 2015). The unplanned building, short urban infrastructure and public urban spaces, non-resistant building, lack of knowledge and technology, and incompetence management are some problems in Iran. As Ghasemi et al stated, Iran's national strategic policy had been the distribution of the increasing inhabitants in the new towns (Ghasemi et al., 2019).

Although Iran has built 23 new towns, many believe that it needs yet homes, public spaces, and infrastructures. Therefore, the 23 projects do not satisfy the classic standards and services and cannot attract the customers. Recently, the government has stated that it will only have a supervisory role in housing construction projects. Of course, this monitoring is done by assigning projects to corrupt government agents. Recently, the government has stated that it will only have a supervisory role in housing construction projects. Of course, this monitoring is done by assigning projects to corrupt government agents (Sun et al., 2019). The latest huge housing project in Iran called for the Mehr housing project, which had been loosed out and canceled due to several claimed failures (Arefian and Moeini, 2016). The Mehr housing policy was in the framework of the duty of the Islamic government constitution to provide homes for the citizens. But after removing this policy, there is no plan to provide homes in Iran. Therefore, now, the housing sector is wandering and locked.

Persistent poverty in the majority of the ordinary Iranian people hinders them to build, buy or rent suitable homes (Hosseini, 2018). Provincial segregation is another hindering factor that makes the housing policy in Iran unsuccessful. The segregation within Iran's cities influences negatively neither. The latter segregation is observable in the form of special protected housing zones belonging to the government official staff, loyal professors of universities, the staff of the judiciary and etc. while the ordinary people live in eroded, dispersed and marginal urban districts of the cities (Shirazi, 2018). That is why the new towns have not been successful to attract the people (Hatami and Siahooei, 2013). The above-mentioned challenges suggest that Iranian housing and new town building trends are in an incorrect direction. The development shall be shifted to new knowledge-based and environmental-friendly planning and design methods (Maurya et al., 2020). Therefore, the need for new housing policy and professional urban development exists.

The present unsuccessful housing policy and building g production shall be stopped. That is why the debates on the methods and results of the national housing policies and the situation of the new towns are still continuing. The question of the current discussions concerning the housing policy is whether the earlier housing projects and the latter Mehr project have met their goals? Therefore, the preferences and needs of the local people shall be known as bulks of the new developments. This case study gathered the ideas of local people concerning the following questions:

(i) How many buildings in different applications are wanted for the future population in the place?
(ii) How shall we plan and build to meet the real needs of the inhabitants?

The survey was done in the new town of Ramshar with the help of a questionnaire.

Field studies in the new town of Ramshar

The field studies were done in Ramshar new town. Ramshar is approximately 40 km South of Zabol City, next to Zabol-Zahedan Road and the border of Iran and Afghanistan. Therefore, it has an international position (Figure 1). This case study analyzes the impacts of Ramshar on the housing market and compares the results to the standard, well-planned, functional and successful new towns suggested by the principles and suggestions presented by the scholars. Many apartments had been built in Ramshar. Unfortunately, the Ramshar project has failed dramatically. The New town of Ramshar failed in terms of respecting the classic indicators of engineering standards, land-use policies, climate and, natural resource considerations and including the local lifestyle and livelihood needs.
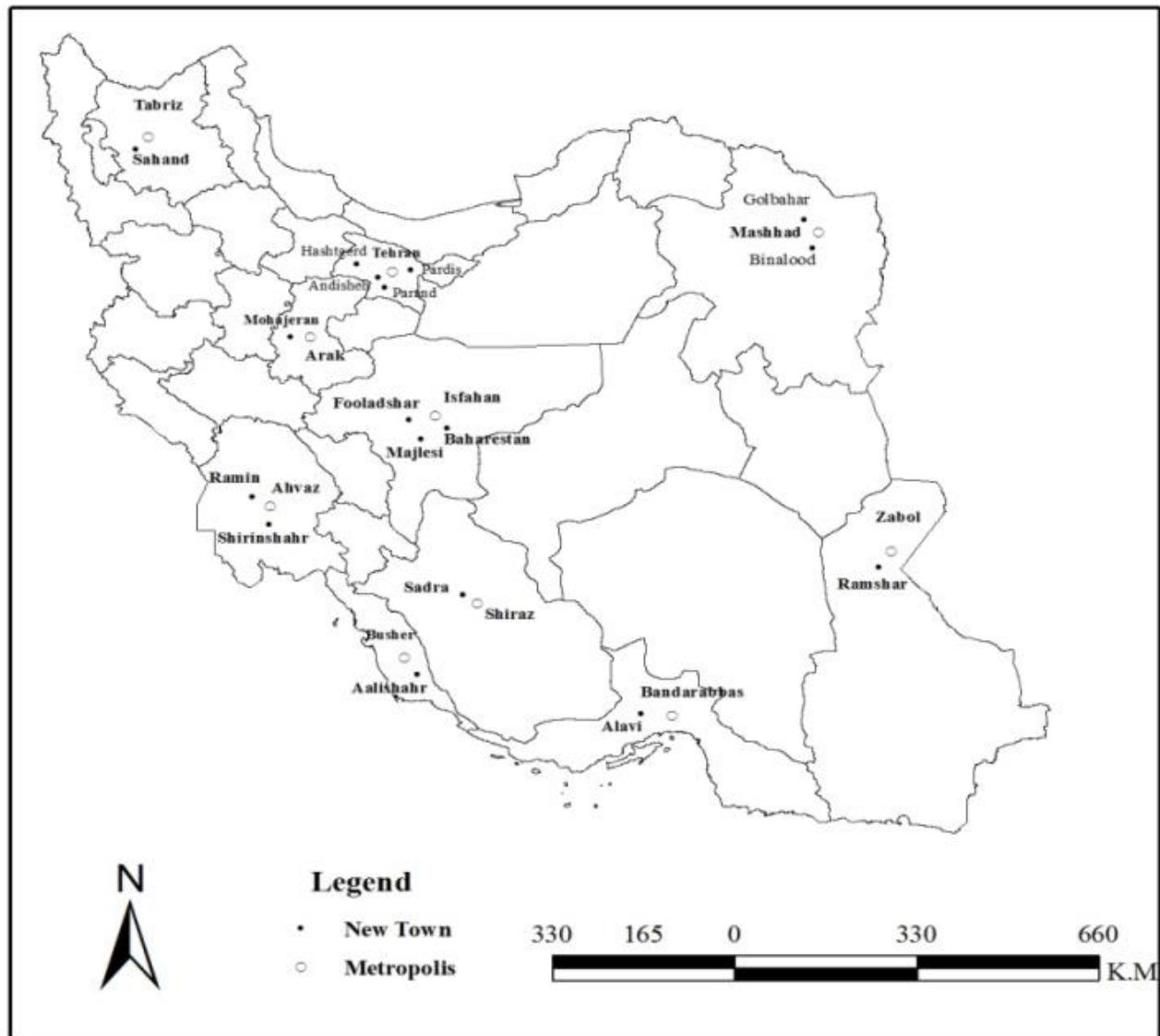
Figure 1. Location of Ramshar new town.
Source: Varesi and Ghanbari (2012).

The failure has its roots in none feasibility studies before starting the building process. The corrupted managerial authority, which is responsible for the New town project is weak regarding the required knowledge, technology, and skills. Our observation in Ranshar shows that the project had not been in line with the regional lifestyle and livelihoods. We analyzed the market to correct the production line of buildings in the future. We tried to find answers to the following important questions:

(i) What types of homes, buildings and urban services shall be planned to attract likely customers?
(ii) Will there be users to rent or buy the buildings regarding the economic ability of the people of the region?

The gathered data and information determine the future demand and supply of building numbers, structural types, architectural models, applied building materials, etc. The demand analysis includes demographic features, purchasing ability of local people, the number of likely immigrants and overall expected customers. The gathered data assist to survey the quantities and qualities of the existing houses, flats, offices, public spaces, water supply network, sewage system, and urban internal and external transportation infrastructures. We applied a questionnaire technique to foster public consultation and participation. The questions focused on the demographic and economic features of the region. Further, we asked about the preferences, interests and expectations of local people.

Table 1. Number of jobs in different economic sectors.

Type of job	Number	Percent
Unemployed	56	20
Other jobs	30	11
IT and computer	4	1
Military	120	43
Education	30	11
Care and hygiene	20	7
Private sectors	20	7
Total	280	100

Table 2. Income distribution in the sample population per $.

Income/month	Number	Percent
>270	0	0
180-270	40	14
100-180	100	36
50-100	110	39
<50	30	11
Total	280	100

We have tried to make a statistical population, which represents all the people in the study area to get reliable results. We distributed 500 questionnaires and two hundred and eighty equal to 56% of those were returned with responses. We collected and grouped their data. Finally, we analyzed and interpreted the outcomes to outline some qualitative conceptual suggestions. The suggestions predict more likely future trends of the needs, expectations and priorities of the local people related to the housing and town building policies.

We learned that 86% of the responders were males and 14% females. The major shares of the respondents are the local people. The age distribution of the respondents is such that 11% of them are younger than 30 years, 75% between 30 and 50 and 14% are more than 50 years old. The main fact is that 75% of the respondents are between 30 and 50 years old. The fact that respondents are people, who are more involved in economic activities, ensures the validity of the answers. The result suggests that every family has four members on average. 57% of the total family members are males and 42% of them are females. The sample population states that 68% of family members are within the labor force and 32% of family members are less than 18 years old. It could be said that during the first phase of the Ramshar development, the building of educational, hygienic, sport and other urban spaces in the group of 7-18 years old are very much needed. The target of Ramshar was to lodge 5000 people during its first development plan. It means that Ramshar had to give facilities for 1135 persons equal to 24% of the Ramshar population during the phase. The obtained data show that 20% of the respondents are unemployed. Approximately 80% of the employed people work at governmental organizations and only 20% of them work in private sectors. This study recognized that people in the state sectors have special powers and advantages, which will have caused widespread inborn corruption. Table 1 shows the different economic sectors in the region. As Table 2 states, regional people have got various incomes. Almost 50% of respondents were paid less than 100 $ monthly. Only 14% of them receive 180- 270 $. Table 2, that except for some particular individuals, the majority of the people are poor indeed. Therefore, the incomes are not at all in proportion to the high prices of the buildings.

We examined the socioeconomic impacts of Ramshar's new town project in the region too. We inquired whether the building of Ramshar will improve the quality of life in the region. We asked as an example if the project will increase investments in the region or not. The various ideas of regional people have been collected and categorized (Figure 2). Figure 2 exhibits that some 10% of the regional populations believe that the Ramshar project will not improve regional development while a higher percentage of people expect positive regional impact for Ramshar. Some 31% are sceptical. It seems that most regional people have positive outlooks about Ramsar's impacts on the region. We also asked about the regional impacts of the Ramshar project. The opinions of respondents are summarized in Figure 3.

As you see in Figure 3, the share of respondents who do not believe the positive impact of Ramshar, particularly in terms of improvement of quality of life is 21%. On the other hand, 16% of the respondents believe that the project will cause advantages for the region. 14% do not expect that the project will increase cooperation in the region. Approximately 49% of the respondents believe that Ramshar's new town will create positive development outcomes. This study also explored the regional opinions if the building of Ramshar is a correct decision. Table 3 shows the average grade, which people gave for the idea of building Ramshar.

As seen in Table 3, the lowest grade is zero and the maximum grade is 20, an interval between 0 and 20. Thus, people gave the grade 9.3 from 20 to the decision of building the new town of Ramshar. In fact, some people have many doubts about the future of Ramshar and they are not optimists. This grade proves that people fear failures in terms of planning, design, constructing, using building materials, required infrastructure, natural and water resources, management and none real regulations. It indicates that the current architectural models and types of houses, homes and urban spaces in Ramshar may not be suitable to the lifestyle and livelihood requirements of the regional people.
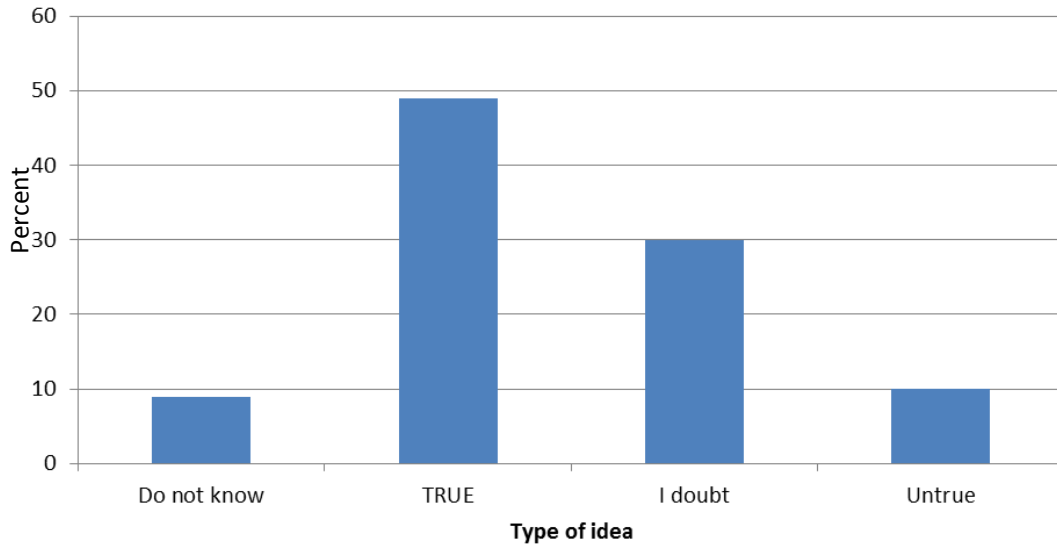
Figure 2. Ideas about impacts of the Ramshar project in the region.

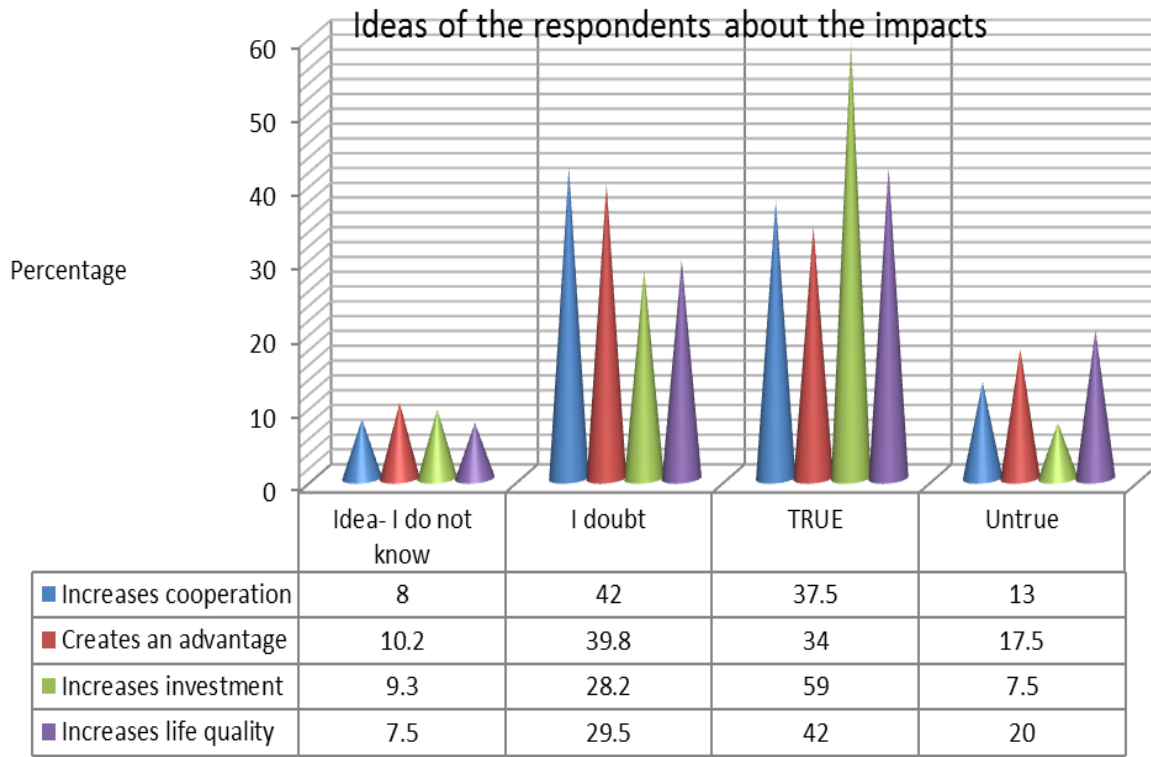|	Idea- I do not know	I doubt	TRUE	Untrue
■ Increases cooperation	8	42	37.5	13
■ Creates an advantage	10.2	39.8	34	17.5
■ Increases investment	9.3	28.2	59	7.5
■ Increases life quality	7.5	29.5	42	20

Figure 3. Ideas of the local people about different types of the new town project in the region.

We studied the impact of the Ramshar project on the labor market. We would like to see if Ramshar will influence on the labor market positively. This study selected six significant indicators related to the impact of Ramshar on the labor market (Table 4). The data state that a majority of respondents do not believe that Ramshar will affect the labor market positively. You see, in the table that 92% of the respondents believe that Ramshar will not supply job opportunities. If you look at other indicators in the table you do not generally see a

Table 3. Grades of positive impacts of the Ramshar project.

Description	Grade range	Average	Respondents
To build Ramshar is a right action	From 14 to 20	17	99
I have my doubts on the project	From 7 to 13	10.5	40
To build Ramshar is totally wrong	From 0 to 6	3.5	141

Table 4. Ideas about impact of the Ramshar project on the labor market.

Type of impact	Not true	Having doubt	True	No idea
Growth of job opportunities during the next 10 years	28	42	26	4
Shortage of workforce will appear	46	15	30	9
The demand for educated personnel will increase	72	17	7	4
The demand for unskilled and uneducated personnel will decline	36	32	25	7
Illegal economic activities and smuggling still will increase	14	35	44	7
Ramshar will be more attractive as a workplace	78	14	4	4

Table 5. Percentage of the demanded various architectural types of buildings.

Architectural characteristics	Respondents	Interest/percent
Firm and modern architectural structures, anti-earthquake	156	56
Firm and traditional structures, anti-earthquake	124	44

Table 6. Measuring demand for various types of homes.

Types of houses	Respondents	Percent
Villa of more than 500 square meters land	26	9
Villa of 200-500 m^2 land	100	36
Villa of 200 m^2 land	120	43
A 2-4 room flat	3	1
A 2 room flat	31	11

positive outlook about the impact of Ramshar on the regional labor market. On the other hand, since Ramshar is a border town the problem of smuggling can have an impact on the responses. Almost 48% think that the building of Ramshar without uncorrupted urban management; modern traffic infrastructure networks will encourage the illegal economy and smuggling.

Finally, we explored the housing market in the region of Ramshar. We should understand why Ramshar has failed to attract people and whether the failure depends on the structural systems of the houses, architecture of building products or the applied building materials. Table 5 reports the results.

According to Table 5, 56% of people prefer modern architectural styles. A large percentage of people would like traditional architectural types as well. However, both groups insist on firmness and resistance to the buildings

against earthquakes and natural hazards. Another significant factor in the housing market is the prices of the homes. Therefore, the Ramshar project should decline the costs of building productions. This study also asked people if they would prefer flats or villas. Table 6 reports what the respondents wish.

Table 6 states that overall people prefer villas. This is understandable since people produce agricultural commodities and they cannot live in flats. 88% of the respondents prefer villas sitting on $200 m^2$ land compared to flat alternatives that are preferred by only 12%. The observation proves that the flat building in Ramshar has been a basic error. The field observation further contributed to the understanding of the regional market demands to the building production and urban infrastructures. People would simply like to see detached

houses in Ramshar rather than apartments. The next section of this paper presents a model to program the building productions or with other words the housing policy optimally.

PROGRAMMING AND RESULTS

Programming for required buildings

There is always an association between optimal housing and new town planning and its determinant variables. One important variable is the growing regional population. This study checked the regional preferences and recognized the ideas of regional people about types, sizes and qualitative features of the needed future building productions in Ramshar. This study got a real understanding of likely demands for different types of buildings. Now, let us apply linear programming to build a working model mathematically in the sake of future housing policy in Ramshar. We call the model programming types of needed buildings, PTNB. The model programs the types of needed buildings and assists in the development of Ramshar scientifically and successfully. We start setting up the PTNB model with the following general equation:

$$Y = mX + b \qquad (1)$$

$$Y = m_1 X_1 + m_2 X_2 + ... + b \qquad (2)$$

when a multiple ranges of variables exist.
We have got four variables as follow:

X_1 = the number of demanding villas,

X_2 = the number of demanding flats,

X_3 = the number of modern buildings and

X_4 = the number of buildings with respect to the inhabitants' lifestyle and livelihood requirements.

The PTNB model supposes that the new town of Ramshar will plan and build villas and flats upon the marketing analyses. The new town of Ramshar uses linear regression analysis to estimate the areas of land used in different types of building productions. Table 7 introduces the variables used in our linear programming.
In Table 7 you see the names of variables and their largest, least and average sizes. You see the diversification from the average called for Std Dev as well. It assumes that a direct linear correlation exists between the independent variables $(X_1, X_2, X_3 and X_4)$ and the dependent variable (Y) and the total land area occupied). Therefore, we write the Equation 3 as:

$$Z = 34 X_1 + 246 X_2 + 39 X_3 + 31 X_4 \qquad (3)$$

Call Equation 3 as a target function Z. Z is the maximum number of households that will be settled in Ramshar during the first phase of the development plan. Z is an association between the households interested in various flats and those interested in different villas. It also specifies the rate of applied modern and traditional architectural styles of buildings. To develop the model, assume the followings:

1-The total lands allocated for homes are **20** ha in the first phase and
$$X_1 \geq 0, X_2 \geq 0, X_3 \geq 0 and X_4 \geq 0$$
2- X_1 is the number of households interested in different types of flats and $X_1 \geq 34$

3- X_2 is the number of households interested in villas and $X_2 \geq 246$

4- X_3 is the number of modern homes needed.
5- X_4 is the number of buildings, which respect the inhabitants' lifestyle and livelihood.

Consider also the following limitation equations.

$$17 X_1 + 123 X_2 \leq 200000 \qquad (4)$$

$$17 X_1 - 123 X_2 = 0 \qquad (5)$$

$$39 X_3 + 31 X_4 = 280 \qquad (6)$$

Thus, see the following system of equations:

$$\begin{cases} Y = 17 X_1 + 123 X_2 + 39 X_3 + 31 X_4 \\ Y = 17 X_1 + 123 X_2 = 200000............. \\ Y = 17 X_1 - 123 X_2 = 0...... \\ Y = 39 X_3 + 31 X_4 = 280.................... \end{cases} \qquad (7)$$

The problem is solvable both algebraically and geometrically. The variables have been found at the following:

$$X_1 = 5882, X_2 = 813, X_3 = 28 and X_4 = 37.$$

In fact, to find the number of homes for Z number of households in Ramshar we have:

$$123 X_2 = 17 X_1$$

The upper equality means that while Ramshar builds one flat it shall build seven villas. In practice, the villas are suitable homes for Sistan's people and pertinent to their economic activities and lifestyle. The size of the Z will be specified by the Equation 3. The total area of land needed for homes is equal to 20 hectares as it has been

Table 7. Descriptive statistics.

Variable code	Variable description	Mean	Std. Dev.	Minimum	Maximum
Y	The total land area occupied/square meter	100000	141421.35624	0	200000
X_1	Number of demanding villas	2941	4159.20209	0	5882
X_2	Number of demanding flats	406.5	574.87781	0	813
X_3	Number of Modern buildings.	2	2.82843	0	4
X_4	Number buildings which respect the inhabitants' livelihood	1.50	2.12132	0	3
Z	Total number of households	140	197.98990	0	280

decided already. Thus, the land area for every type of building will be decided by solving the equation system 7 in every exact situation.

Outcomes of the case study

The purpose of this case study was to understand the reason for the housing policy failures in Iran.
The problems of the housing and town building policies were explored by the Iranian scholars' publications, the author's academic and workshop experiences and ideas of the local people. We found the problems as follow:

(i) The housing and new town building policies in Iran are unsuccessful in various perspectives
(ii) The dominant and structural corruption in the process of the developments
(iii) The expansion of unplanned and unauthorized built environments
(iv) None existence of the required urban infrastructures
(v) The vulnerability of the built environments against risks and hazards
(vi) Incompetent, unscientific and ideological urban management
(vii) Lack of engineering, materials and structural building codes and standards
(viii) The none existence of a rational macro, regional and local published housing policies
(ix) Persistent poverty amongst the ordinary people in Iran
(x) Segregation in support and funding between different provinces and cities
(xi) None sustainable housing activities
(xii) Housing projects do not respect the requirements of local people

We performed a case study to examine the details of Iranian housing and town building policies. We learned that the place of Ramshar's new town had been selected wrongly considering the site planning techniques. The locating is not appropriate because it is alongside the two countries, Pakistan and Afghanistan with regional conflicts. The place is not an optimal one since it is not resistant against various climatic tensions like ever-existing sand dune storms. In addition, the soil of the place is not suitable for planting and vegetation. Our observation proved that Ramshar has not got competent management and a knowledge-based strategic plan. The Ramshar project has not included public participation in the process of the development. We observed that there are no clear regulations to use the urban lands fairly and to hand over the flats, villas, and other productions of the new town to the needy people.

Our marketing studies for the building productions showed that the Ramshar project had been planned regardless of the livelihoods of indigenous people. People gave a score of 9.3 from a total of 20 that means a noteworthy disappointment. Surveying people's opinions showed that they like resilient homes and towns against risks and natural hazards. We learned that the most significant obstacle to develop Ramshar is the lack of water resources. Ramshar depends on the Hirmand River, which originally comes from Afghanistan. The analysis made in the new town of Ramshar voiced a need for a new urban planning and design model aiming at building suitable to the inhabitants' preferences while there are many new demands for homes. The outcome of our case studies is the model of Programming Types of Needed Buildings, PTNB. The model of PTNB forecasts different types of wanted buildings. The model can program the housing and town building policies, according to our understanding of the characteristics of the region and the needs of the local people. The model says that the ratio of production of an apartment to a villa is $\frac{1}{7}$, that is, one apartment, but 7 houses with yards or villas. Such a production line would have customers. In addition, there is an imbalance between the public urban spaces and residential spaces in the new towns. That is why the new towns became only dormitories. The PTNB model, of course recommends including urban infrastructure and essential services in the process of development.

Conclusions

This paper explored major problems in the current

housing and town building policies of Iran. The theoretical framework introduced some indicators and standards for optimal housing planning and development. The case studied introduced the failures of the new town project and Mehr housing project in Iran. It analyzed the process of planning and building the Ramshar new town in detail. We discovered that the new town of Ramshar had had shortages in feasibility studies, locating studies, planning procedures, design standards, environmental and climate codes and socioeconomic indicators. The result of this study proved our hypothesis on the necessity of changing the current failed housing policy. Our marketing analysis could program the required building productions for the future in the new town.

As the population number increases in the metropolises many critical urban difficulties are arising. The findings of this research verify that the planners and decision-makers in the global housing market need to build new built environments based on the preferences of the inhabitants. The presented PTNB model assists the regional planners and decision-makers to program optimal housing and town building strategic policies with sustainable outcomes. The method of analysis performed and finally, the PTNB model presented in this article can be a helpful guide for urban planners, engineers, investors, and decision-makers everywhere because this model anticipates market needs.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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