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An Analysis of the Development of New Towns as a Driving Force in Response to Metropolitan Needs

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Abstract. The construction of new towns is one of the oldest urban development policies for dealing with the problems of large cities in the world. Although the nature of these problems in large cities has changed in the modern era, urban planners have been able to use this policy to deal with today's problems by revising and reforming implementation principles and procedures. In Iran as in many other developing countries, the rapid growth of urbanization is not commensurate with the power to equip urban spaces and expand urban infrastructures. Since urban spatial distribution and population control have not been managed within the framework of a master plan based on sectoral and regional coordination, the subsequent problems have become so complex that require extensive planning and huge efforts for reaching a solution. The present study is conducted under the title "an analysis of the development of new towns as a driving force in response to metropolitan needs" in order to analyze and evaluate the ways for developing new towns in planning second-level metropolitan areas in Tabriz, Iran, and to evaluate a sample of these towns in order to identify the issues related to the construction of these cities for developing a suitable model for successful planning in new towns. Besides identifying the status quo of new towns and revising the actions and operations in developing these towns, this objective and realistic evaluation can lead to solutions based on which we can continue to move ahead regularly, with higher levels of coordination, and in a relatively clearer situation by learning lessons from past experiences. In line with the objectives of this study, the researchers assess the need for planning and building new towns, select and evaluate a case for analysis (the new town of Sahand), and finally provide relevant suggestions and recommendations. The method used in the analyses and evaluations is deductive – the observation of procedures in developing a construction plan for the new town of Sahand. Suggestions are made based on the determinants of decision-making and authoritative areas.

Keywords: Urban development, spatial distribution, metropolitan, the new town of Sahand

1. INTRODUCTION

Increasing urban population, uncontrolled growth of large cities, and the resulting negative problems and consequences have always been the concern of interested scholars as well as officials and urban planners. This phenomenon, which has accelerated significantly since the Industrial Revolution especially in recent decades, has had a very negative impact on urban life and subsequently on many social and economic plans in different countries. Therefore, dealing with this situation and implementing policies and strategies to reduce the negative impacts have always been of interest to experts and urban planners. Indeed, there are few towns or countries that have not been involved with these issues. The international attention to the protection of the environment by building new towns all around the world, whether in developed countries or in

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Third World countries, has prompted scholars to start serious efforts to locate new towns with an emphasis on environmental factors (Zare: 1993,17). New towns after World War II became a model to help solve the social, economic, and environmental problems of large cities. This model promotes the equal distribution of population and employment in a whole country. The concept of new towns with regional development tools rapidly spread throughout the world. This approach was taken not only in countries undergoing rapid urbanization but also to create poles of growth, spatial organization, attracting crowd overflows, population growth control in cities, transferring administrative and political centers, saving pieces of agricultural land from destruction, developing backward areas, rebuilding destroyed cities, integrating villages, creating a favorable atmosphere for the settlement of industrial workers, as well as decentralizing growth population in capital cities, scientific identity and spatial distribution of industries and population (Ziari: 1999, 49). In fact, the reason behind the continued application of the policy of new towns is its flexible capacity in terms of performance. Modifying the scale, position, number, function, implementation method, and density can have a significant impact as the result of implementing this policy. Therefore, it is possible to use it for solving urban problems by making decisions about them. This feature has encouraged planners and urbanists to pay more attention to the implementation aspects of this policy and design the implementation plan based on the recognition of the nature of issues and the role that the construction of new towns can play in solving problems. A review of past experiences suggests the importance of implementation issues in the successful enforcement of this policy (Edalatkhah: 1993, 93). The present study considers this issue both from a general perspective and in the form of a case study. The aim of this study is to analyze the success rate of solving the problems of metropolitan areas by constructing new towns with an emphasis on the role of the new town of Sahand.

2. RESEARCH OBJECTIVES

1. Evaluating the new town of Sahand and identifying an appropriate location as the site of construction in East Azerbaijan province.

2. Drawing a conclusion about the quiddity and type of problems via analyzing the impact of new towns on the environment, identifying the achievement limits of the objectives of the plan, and suggesting a framework for preventing problems caused by the development of new towns.

Research Methodology

Since the aim of this paper is to achieve a framework of strategies for the planning and management of new towns in East Azarbaijan province, especially in the new town of Sahand, it uses a case study design. Because the study is an attempt for planning, it is performed based on a survey case study methodology. To clarify the basic principles and theories, the researchers deploy inductive (experimental-scientific) and descriptive methods. Then, by examining and identifying our case (the new town of Sahand), the researchers deploy descriptive, field, and documentation procedures to study and evaluate all the spatial components, elements, and functions as well as their interrelations. Furthermore, analytical methods are used for evaluating the reception-level of possible strategies and suggesting optimal solutions.

3. CASE STUDY SELECTION EVALUATION (THE NEW TOWN OF SAHAND)

To evaluate the selected object of study, this article performs a theoretical case study. For selecting the case, second-level metropolitan areas of Iran are considered. These metropolitan areas with a population of over a million come second to Tehran as the largest metropolitan city of Iran - including cities such as Mashhad, Isfahan, Tabriz, and Shiraz, which are second-level metropolitan areas and have a large population but only following Iran’s most populated and greatest metropolis, Tehran.

Development Process Evaluation (The New Town of Sahand)

The present study evaluates the process of developing the new town of Sahand in key areas such as development proposal and approval, development location, as well as development prospects, predictions, and management of the new town of Sahand (Reports on Positioning Surveys of the New Town of Sahand, Sahand New Town Development Company, 1997).

1. Evaluating the Initial Proposal and Approval of the New Town of Sahand

The development proposal for the new town of Sahand was issued in 1985 to the Cabinet of Ministers by Iran's Department of Housing and Urban Development. In the same year, the Cabinet of Ministers adopted the proposal and subsequently initiated positioning surveys for determining the site of construction (Ibid: 1997)

2. Evaluating the Method of Positioning the New Town of Sahand

Positioning surveys for determining the site of constructing the new town of Sahand were carried out in 1988 within a distance of 60 kilometers from Tabriz and in four different cases: (A) Tabriz-Azarshahr, (B) Tabriz-Ahar, (C) Tabriz-Sufian, and (D) Tabriz-Bostan Aban. The positioning method required first of all the selection of 13 points around the cases leading to Tabriz. Then, using developed criteria, the final decision was made on the east side of the Tabriz-Azarshahr case along the skirts of Sahand (Reports on Positioning Surveys of the New Town of Sahand, Sahand New Town Development Company, 1988).

3. Evaluating the Effective Factors and Criteria in Positioning the New Town of Sahand

The criteria for positioning the site of the new town of Sahand are as follows:

1. Suitability of the selected site in terms of size compared to the needs of the metropolis
2. Convenient access to the new town via existing routes

3. Appropriate distance from the metropolis
4. Absence of land ownership problems

5. Access to activity and employment centers
6. Feasibility of creating various infrastructure systems in technical and economic terms

7. Suitability of the selected site in terms of natural properties
8. Lack of overlap between the selected site and high quality agricultural land

9. Positive impact of the selected site on the surrounding villages and reducing the service load of Tabriz (Reports on Positioning Surveys of the New Town of Sahand, 1991).

4. Evaluating the Predictions and Proposals of the Development Plan of the New Town of Sahand

The prospects and predictions of the development plan of the new town of Sahand include population, employment and use of space predictions, which are studied in various aspects of prediction methods, prediction timing, basic assumptions in the prediction, and statistics on the use of prediction results (Surveys on the New Town of Sahand, Tabriz, 1980, Prerequisites for Planning, Volumes I, II and III).

A. Evaluating the Population Prediction of the New Town of Sahand

The population of the new town of Sahand has been predicted in three in three temporal stages and in two options without any mention of the selection criteria. The first population prediction option for the year 2011, which was equal to the population determined by the Ministry of Housing and Urban Development, has been selected and approved as the best possible option (Table 1).

Table 1. Population prediction for the new town of Sahand in stages of development (*1000).

2011	2001	1996	Description	Row
4	3	2	1	
150	60	30	First Option (Final Option)	1
200	75	30	Second Option	2
150			Population prediction for the new town of Sahand as determined by the Ministry of Housing and Urban Development	3

Source: Strategic studies on new town of Sahand, section on population characteristics

B. Evaluating the Employment Prediction Procedures of the New Town of Sahand

The approach adopted by the consultant for predicting the employment of the new town of Sahand was to fist develop basic prediction assumptions and then to predict two alternatives (maximum option and possible option).

Table 2. Residents of the new town of Sahand based on employment location in 2011.

Surroundings		Salimi industrial city		Tabriz city		Sahand town		Employment location	Row
Possible option	Maximum option	Possible option	Maximum option	Possible option	Maximum option	Possible option	Maximum option		
9	8	7	6	5	4	3	2	1	
950	1000	7550	11500	5500	11000	9250	18500	Production and service sectors	1
300	1500	250	500	6500	13000	6500	1300	Public welfare	2
1250	2500	600	12000	12000	24000	15750	31500	Total	3

Source: Strategic studies on new town of Sahand, section on economic characteristics

Evaluating Space Utilization Propositions

Propositions concerning the utilization of urban space are studies based on the method and basic data used in perdition procedures.

Evaluating Space Utilization Determination Method:

In the strategic development plan of the new town of Sahand, the consultant first developed a proposed utilization plan in two options based on basic density and urban capitation data for the year 2001 and then another proposed utilization plan in two options for the year 2011. Also, before developing a strategic development plan for the year 2001, the consultant developed two land preparation plans (land preparation plan 1 and 2) that determine the urban capitation and urban space utilization for the new town of Sahand in this year.

Basic Data used in Space Utilization Determination:

Basic data used by the consultant for determining space utilization, space density, and urban density and capitation in the new town of Sahand are described here:

1. The size of population and the composition of social strata of the town in addition to the importance of catering to the general and cultural needs of people are a key factor in space utilization planning. Overall, the proposed population of the town consists mainly of middle class

residents.

2. The performance of the new town of Sahand and its economic goals are one of the most important factors in determining space utilization.

3. Sahand's commuting system is made up of a road network and a light interurban network. Furthermore, Sahand's urban transport system is composed of public transportation (bus).

4. The spatial structure of the town, following the town's topography, is focused on reducing horizontal construction patterns and increasing vertical construction patterns. (Master Plan for the city of Tabriz, Field Consulting Engineers, 1994)

Table 3. Required spaces for the new town of Sahand in 2011.

Total	Land required for higher education (acres)	Land required for the resettlement of the population (acres)	Population in 2011
2100	585	1500	150/000

Source: Strategic studies on new town of Sahand, section on planning characteristics

Table 4. allocation of new spaces to the new town of Sahandç

Urban population capacity	Area (acres)	Description	Row
3	2	1	
-	13000	Total town area	1
-	4500	Land with a slope of 0 to 10%	2
500000	4500	Gross density (100 people)	3
440000	4500	Population capacity by modifying another part of the spaces	4
70000	-		5

Source: Strategic studies on new town of Sahand, section on planning characteristics

Table 5. Utilization of proposed spaces in the new town of Sahand (two alternatives) in 2011.

Total		Network		Services		Higher education		Residential		Description	Row
Second option	First option	Second option	First option	Second option	First option	Second option	First option	Second option	First option		
11	10	9	8	7	6	5	4	3	2	1	1
1890	1920	400	390	500	350	600	600	390	480	Utilized space area	2
127	126	27	26	34	30	40	40	26	30	Capitation	3
100	100	21	3.20	26	4.23	32	3.31	21	25	Percent of the total town area	4
100	100	31	5.29	39	1.34	-	-	30	4.36	Percent of the area without higher education	5

Source: Strategic studies on new town of Sahand, section on planning characteristics

Table 6. Proposed density and capitation for the new town of Sahand in 2011.

Second option no.	First option no.	**Description**	**Row**
3	2	1	
385 per one acre	312 per one acre	Net residential density	1
80 per one acre	78 per one acre	Gross residential density	2
127 square meters	126 per one acre	Urban capitation	3
77 square meters	84 square meters	Urban capitation without higher education	4
150,000	150,000	Population	5

Source: Strategic studies on new town of Sahand, section on planning characteristics

Table 7. Predicted utilized spaces in two land preparation plans in 2001.

Total(population= 69,000)			Preparation plan 1 (population= 50,000)			Preparation plan 1 (population= 19,000)			Type of utilization		**Row**
% Compared to total	capitation (square meters)	Space (acres)	% Compared to total	capitation (square meters)	Space (acres)	% Compared to total	capitation (square meters)	Space (acres)			
10	9	8	7	6	5	4	3	2	1		
28.6	42.23	161.63	28.4	24	120	73.28	21.91	63.41	Residential activities		1
	248	20.32	140.19	26.6	113	77.18	41.31	27.19	Production	Production and service activities	2
8.0	75.31	219.06	34	28.6	143	29.52	40.03	76.06	Communication networks		3
8.7	7.6	44	10.5	8.8	44	-	-	-	Other		4
100	81.9	564.88	100	84	420	100	76.25	144.88	Total		5

Source: Strategic studies on new town of Sahand, section on planning characteristics physical development patterns

Evaluating the Development Process of the New Town of Sahand

The purpose of compiling and analyzing the development process of the new town of Sahand is to assess procurement processes and program implementation processes based on analyses before the development of the plan in order to determine the strengths, weaknesses and deficiencies in planning, decision-making and implementation of the new town of Sahand and then to prepare the ground for formulating proposals (Surveys on the New Town of Sahand, Tabriz, 1980, Prerequisites for Planning, Volumes I, II and III).

Evaluating the Method of Positioning the New Town of Sahand

Positioning new towns includes regional studies, an initial selection of several sites, developing selection criteria, the application of criteria to different sites, and choosing the best alternative – that is, the most suitable site for the development of the new town. Common and specialized methods are not used in positioning the site for developing the new town of Sahand. Instead, merely development and selection criteria are determined on the basis of these technics. In most developed, socialist, and developing countries, especially since the 1960s, the sites of new towns have been have been located on the basis of national and regional programs and with a logistical point of view. This comprehensive approach to the development of new towns has had a great impact on the success or failure of new towns (Reports on Positioning Surveys of the New Town of Sahand, Sahand New Town Development Company, 1988).

Figure 1. The location of the new town of Sahand.

Evaluating the Factors and Criteria used in Positioning the New Town of Sahand

The criteria and factors in selecting the site of the new town of Sahand are analyzed and evaluated according to their comprehensiveness and authenticity.

Criterion 1: Suitability of the selected site in terms of size compared to the needs of the metropolis

The suitability space has been mentioned as one of the criteria for selecting the site of the new town of Sahand. However, due to geographical highs and lows, especially in the western regions, a small portion of the total area of the land (12,650 acres) can be used for construction.

Criterion 2: Convenient access to the new town via existing routes

Convenient access via existing road networks has been mentioned as one of the criteria for selecting the site of the new town of Sahand. However, the transport axis between Tabriz and Azarshahr, which is selected as the site of this new town, is the most crowded urban axis in the region and suffers severe traffic congestion.

Criterion 3: Appropriate distance from the metropolis (18 km)

The following three reasons undermine the suitability of distance between the new town of Sahand and Tabriz metropolis.

A. With this small distance, the new town of Sahand is likely to lose its independence and act as the dormitory for the city of Tabriz.

B. Future spatial developments of these two cities may lead to continuity between them. C: In the cold climate of Tabriz, commuting this distance every day in the winter, especially in the absence of an inter-city railway system, can become a problem.

Criterion 4: Absence of land ownership problems

Because the land of the new town of Sahand belongs to the government, there has been no problem in terms of land ownership. This issue has not always been considered in the development of new towns around the world. In the case of other criteria, such as access to activity and employment centers, the feasibility of creating various infrastructure systems in technical and economic terms, the suitability of the selected site in terms of natural properties, the lack of overlap between the selected site and high quality agricultural land, and the positive impact of the selected site on the surrounding villages and reducing the service load of Tabriz, scientific and rational principles

have not been observed, which challenges these criteria. For example, selecting the current location as the site for the construction of the new town of Sahand has led to the destruction of Tabriz rangelands besides causing damage to animal husbandry and leaving a negative impact on the urban environment of Tabriz (Reports on Positioning Surveys of the New Town of Sahand, 1988, Sahand New Town Development Company).

5. CONCLUSION

In an overall conclusion, in order to answer the study question whether the planning and construction of new towns have been performed on the basis of land use planning, we can say that the normal development process in the construction of new towns in the world, especially in the case of the new town of Sahand, has not been done according to land use planning because of neglecting the results of initial feasibility tests in pre-development processes and lack of financial guarantees besides other reasons. Also in response to the other question whether the intention behind the development of new towns in Iran is well planned or a quick decision, we can say that is more of a quick decision than a well though plan because of non-compliance with the normal process of the development of new towns in the world by urban planners and authorities in the process of developing criteria; weak decisions, proposals, positioning, and national and regional programs; non-compliance with the normal cycle of urban planning in preparing development programs for the construction of new towns; lack of attention to the role of local authorities in management and decision-making; and lack of public participation in decision-making in the early stages of the development of new towns in Iran particularly before the Islamic revolution. In response to the third question whether the development of new towns in Iran has helped solve urban development problems, we can conclude that, according to the results of this study based on deductive evaluation, the development of new towns has helped solve urban development problems to some extent but has failed to achieve expected results. These findings and comparisons, as mentioned above, apply to the new town of Sahand and the city of Tabriz as well. Considering the surveys and evaluations of the process of developing the new town of Sahand, the following results can be summed up and concluded:

A. Non-compliance with the normal process of the development of new towns in the world, and in the construction of the new town of Sahand, that is, neglecting the results of initial feasibility tests in pre-development processes and lack of financial guarantees besides neglecting developed criteria in positioning surveys.

B. Non-compliance with the normal cycle of urban planning in preparing development programs for the construction of the new town of Sahand, such as, neglecting development process and problem analyses, failure to develop micro-targets and alternative strategies, and lack of attention to the development of a review mechanism.

C. Lack of public participation in decision-making and planning for the development of the new town of Sahand and neglecting short-term scheduling in the development plan.

D. Inconsistencies in various parts of the plan and lack of a mutual interconnection between different parts of the program on the one hand and experts and planners on the other, such as the lack of consistency between population predictions, stages, and scheduling with proposed physical development stages.

E. Failure to observe the processes of constructing new cities in Iran according to the description of services after the Islamic revolution and the overtaking of executive processes (land preparation and transferal) from development and adoption processes (strategic plan and master plan).

Proposals for the Development of the New Town of Sahand:

1. The necessity for legislating rules in order to involve private developers and local people in decision-making and construction of new towns.
2. The necessity for developing national and regional strategic plans, preparing land use planning, observing the basic goals of new towns, and selecting the sites for constructing new towns from these plans.
3. The necessity for selecting a new site for Tabriz metropolis outside a radius of 35 to 40 kilometers around Tabriz because of the high population density in this area.
4. The necessity for observing the general cycle of planning and normal processes in preparing a development plan for constructing new towns.
5. The necessity for using common and specialized methods in preparing a development plan for constructing new towns and the new town of Sahand
6. The necessity for using a systematic approach to the development and planning of new towns and the new town of Sahand.
7. The necessity for involving private developers and local people in the executive management of new towns and the new town of Sahand.

Generally due to the lack of financial resources and technology in developing countries, including Iran, the realization of these plans largely depends on the objectivity and accuracy of prospects and the management power of authoritative individuals and entities. The use of skilled and experienced individuals in this field for urban management and development of new towns is essential since it ensures the continuity of necessary practices and can act as an effective factor in the success of new towns in Iran, including the new town of Sahand.

REFERENCES

[1] Urartu Consulting Urban Engineers, 1980, Strategic Studies on New Town of Sahand, Vol. 6, Iran's Ministry of Housing and Urban Development.
[2] Urartu, Consulting Urban Engineers, 1996, Sahand New Town Master Plan, Report Summary, Iran's Ministry of Housing and Urban Development
[3] Book of Statistics on East Azarbaijan, 1996, Iran's Statistics Center.
[4] Zare, Jamal. 1993. New Outlook on the Economic, Social and Physical Structure of New Towns in Iran, Proceedings of the Conference on New Towns: A Culture of Urbanization, New Towns Development Corporation, Iran's Ministry of Housing and Urban Development.
[5] Ziari, Keramat-al-Laah, 1999, Planning New Towns, Samt Publications, Tehran.
[6] Sahand New Town Development Company, 19995, An Introduction to the New Town of Sahand, Tehran, Iran's Ministry of Housing and Urban Development.
[7] Edalatkhah, Mohammad. 1993. A look at the goals of developing new towns in Iran. Conference on urban development and new towns, Iran's Ministry of Housing and Urban Development.
[8] Master Plan for the city of Tabriz, Field Consulting Engineers, 1994.
[9] Strategic Studies on New Town of Sahand, Urartu Consulting Urban Engineers, 1991
[10] Positioning Surveys of the New Town of Sahand, 1988, Sahand New Town Development Company.
[11] Surveys on the New Town of Sahand, Tabriz, 1980, Prerequisites for Planning, Volumes I, II and III, Sahand New Town Project Manager, Iran's Ministry of Housing and Urban Development.
[12] Webbe Stephen V., the Garden city: Past, present and Future, London: E and EN Spon, 1974.