

Evaluating Land Use Plans in Line with Climate Change Adaptation Policies in the Semnan Urban Region

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Abstract

Climate change in developing countries are more exposed to the risks of climate change due to a lack of adaptation capacity, an economy dependent on climate-sensitive sectors, gaps in policies caused by central governments, weak institutions and a lack of learning adaptation strategies. This article examines the relationship between land use systems as one of the intervention areas of multi-level climate governance and the policy of adapting to different governance methods in this area. This article also introduces the conceptual model of the compatibility of the land management system and the multi-level climate governance framework, from the documentary research method and the systematic review of texts in the form of documents, laws and programs prepared for urban and suburban development in Semnan urban complex in two decades. Examines the latter. The results showed that Regulating the development process of Semnan City based on climate, and environmental considerations, considering natural hazard management and climate change, improving the level of development sustainability through comprehensive ecological management based on a participatory approach, emphasizing desertification control, water conservation, and protection of Soil, air and vegetation, its optimal use, especially in the northern margin of Iran, The climate change fact is intensive among the Middle Eastern countries and especially Iran.

1. Introduction

The history of development planning in Iran is more than six decades and planning in general and land use planning in particular at this time under the influence of economic, social, and political conditions has always been associated with the changes [1-3]. In this regard, the realization of local governance as a new concept in rural-urban management is very important. Local governance and the formation of new scales over the last few decades have caused local governance to face new challenges [4-5].

The increasing availability of geo-referenced data on subnational entities provides a unique opportunity to link geographical features of local areas in resource-rich countries to administrative, household, and individual data [6].

The literature touches upon urban climate goals indirectly, and mostly by pointing to the gap between intentions and practices in current urban governance [7-8], recent studies have shown that climate change, including changes in precipitation and temperature patterns, has caused hydrological changes in Iran [6, 9, and 10].

The Semnan urban complex is also exposed to the consequences related to vulnerabilities of temperature changes and changes in precipitation in this category and according to the forecast of the Intergovernmental Panel on Climate Change, by 2100 AD, Iran will increase the average temperature above 5 degrees Celsius and Will experience a 10 to 20 per cent decrease in rainfall.

The international level should act as an integrated mechanism to the local level, providing a wide range of possible vertical and horizontal interactions in different parts of the governance framework. In the meantime, what is the basis of this research is to establish the relationship between land use systems as one of the areas of intervention of multilevel climate governance and adaptation policy and different methods of governance in this area. According to the research literature, research has been done in line with this research; for example,

Stehle et al. [11] in the article entitled Urban Climate Politics in Emerging Economies: A Multi-Level Governance Perspective article explores the vertical and horizontal integration of cities' climate actions in the multi-level climate governance landscapes in Brazil, India, Indonesia, and South Africa.

Vedeld et al. [12] drawing upon two strains of climate governance and collaborative governance literature, respectively, this article adopts a polycentric approach to the analysis of Oslo's urban climate governance. It unpacks the relationships between urban leadership, climate goal-setting, and institutional design, and reveals how these variables condition the employment of a combination of integrative and interactive governing instruments that foster both self-governance and co-creation in climate responses.

2. Material and Method

In this study, the method of documentary research and the technique of systematic review of texts in the form of documents, laws, and programs prepared for urban and suburban development in the Semnan urban complex during the last two decades were used. In this regard, after extracting, classifying, and reducing the data in the mentioned projects, the data were analyzed and the compliance of the explained programs with the climate change adaptation policies was investigated. The scale of measurement in the method was the Likert spectrum and the degree of adaptability was done in 5 levels (fully compliant, relatively compliant, partially compliant, relatively non-compliant, and completely non-compliant).

The validity of the answers is based on the audit method and the expert opinions of experts. Among the documents and plans related to the subject under study and at national, regional, and district levels in the last decade, we obtained 3 documents Table 1, which were reviewed. The general research model is presented in (Figure 1).

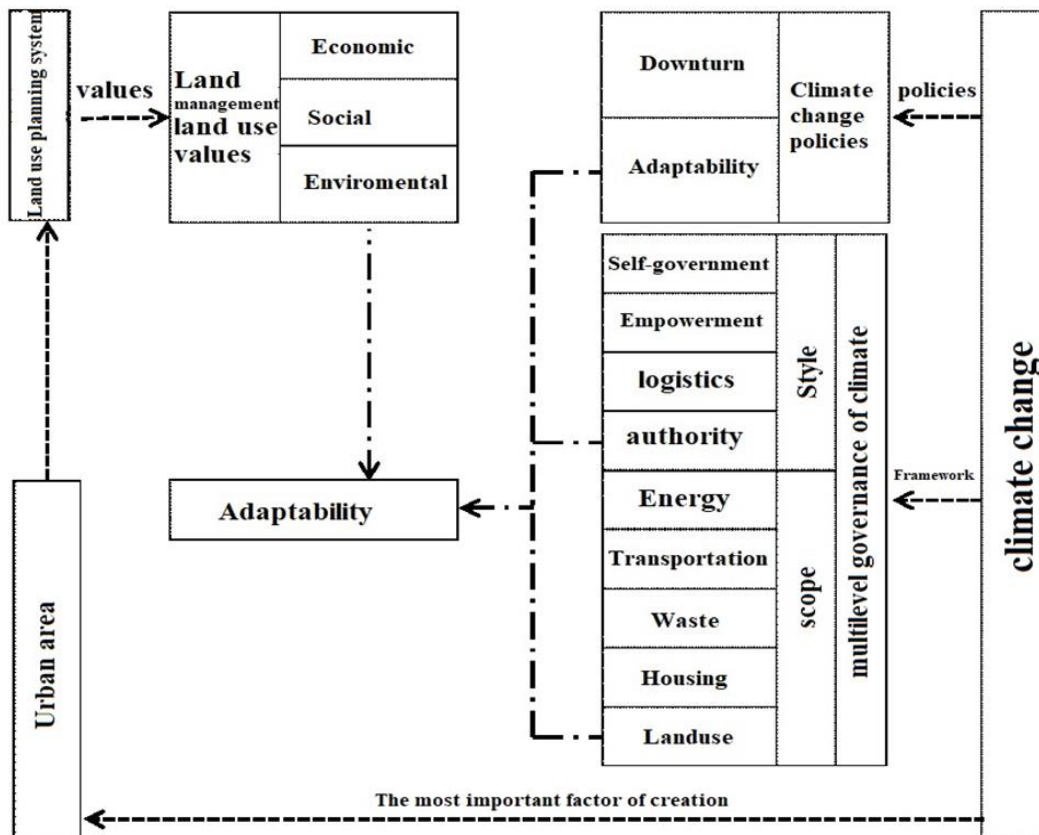


Figure 1. General research model

Table 1. Documents examined in documentary analysis

Approval reference	Operational level	Year of plan approval	Documents reviewed
Supreme Council of Land Management	National	2020	Iran land use document
Iran Program and Budget Organization	Regional	2019	Semnan land use document
Supreme Council of Urban Planning and Architecture of Iran	District	2012	Semnan Urban Complex plan

2.1. Area of Study

Semnan urban area, including the urban complex formed from the links of urban structure between the cities of Sorkkeh, Semnan, Darzin, Mahdishahr, and Shahmirzad - the city of Semnan, has provincial, national and transnational functions. Semnan is one of the cities of Iran, the capital of the province, and the city of Semnan (Figure 2). This city is located in the south of the Alborz Mountain range and north of the central desert plain of Iran, at a distance of 216 km from Tehran (the capital of Iran). And is located 34 minutes away. The city is bounded on the north by the cities of Darjazin, Mahdishahr on the west by the city of Sorkkeh, and on the east by the city of Dam Ghan.

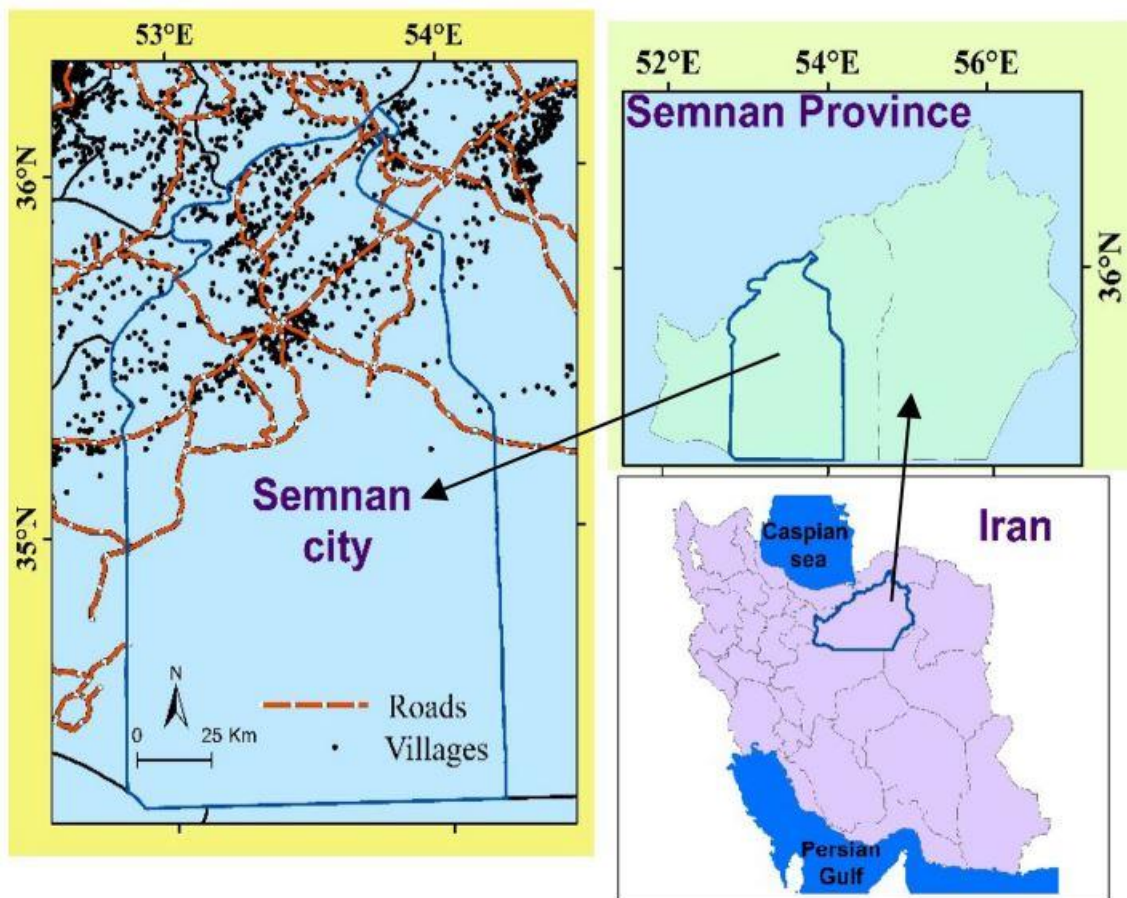


Figure 2. Geographical location of Semnan in Iran

2.2. Land Use Planning in Iran

Iran enjoys the experience of six decades of development planning. During this period, planning in general and land use in particular have gone through many changes and modifications due to the economic, social, and political circumstances of the country (Figure 3). In the land management plan of Iran, Semnan province, the policy of attracting surplus population and overflow of Tehran, Mazandaran and Golestan provinces has been emphasized by undertaking part of the industrial and service activities of these provinces.

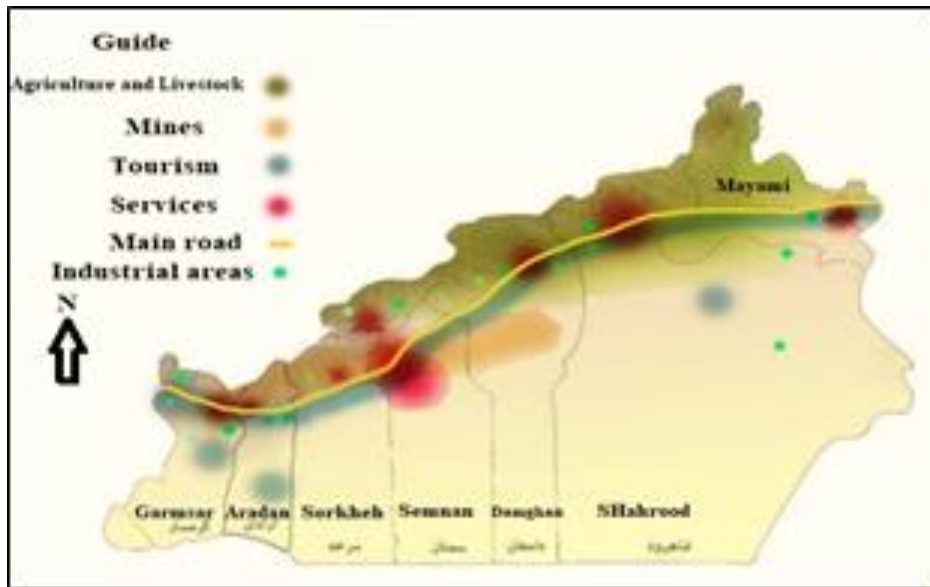


Figure 3. Optimal space organization on the horizon 2045

3. Results

The results showed that the document contains 24 territorial strategies and 254 territorial policies. The territorial strategy determines the main and long-term direction of the spatial development of the territory by considering the capabilities, opportunities and limitations in facing challenges to achieve the desired spatial development goals of the territory, and the territorial policy reflects the policy of implementing the spatial development strategies. It is a land. (Figure 4). Based on the topics studied, this document has considered different roles for this area in the study area (Semnan urban area), which are:

- Logistics center
- The region is prone to producing renewable energy (wind and solar).
- Level one and two level service axis of the city in the residential system Areas prone to special strategic and industrial development.
- Located at 4 communication crossings North-South, East-West, Trisica and Echo.
- Managed areas affected by dust.
- Establishment of industrial activity in the field of production of electronic, computer and optical machines and pharmaceutical products. Also, out of 24 land strategies, 8 strategies were related to environmental issues, land use, and land use-related activities. Below these 8 territorial strategies, 21 territorial policies related to the mentioned topics have been identified and are listed in Table 2. The compatibility of the policies extracted in this document with the policies of adaptation to climate change was examined (Figure 4).

Land use plan and related activities in the land management document of Semnan province																					Land use compatibility policies
21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
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■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	7
Total																					
without communication																					
Completely incompatible.																					
relatively adaptable un																					
somewhat adaptable																					
relatively adaptable																					
fits perfectly																					

Figure 4. Assessing the Conformity of Compatibility Plans and Policies and Land Use Plan and Related Activities in the National Land Use Document

4. Discussion

Based on the results, the degree of compliance of the program in the field of land use and climate change adaptation policies was estimated to be relatively consistent, indicating the high degree of compliance of this document in the field of land use, environment, and related activities. With climate change adaptation policies. Policy No. 9 in the National Land Use Management Document, which refers to the formulation and implementation of climate change adaptation programs in various fields, including water, agriculture and food security, health, tourism, natural ecosystems, etc., specifically states It focuses on adaptation to climate change, which shows the importance of this issue in legislation.

Table 2. Adaptation plans, policies, and land use plan and related activities in the National Land Use Document

Territorial policy	Territorial strategy
Creation and development of infrastructure and hardware and software superstructures of logistics centers in the central area of the east-west of the country, with priority given to Semnan, Qom, and Qazvin zones	Strengthening the joint role of the country in the network of regional and international transit corridors
Development, strengthening, equipping and optimal operation of the national transportation mode network by regional and global transit corridors and focusing on providing competitive services.	
Implementing industrial development programs (agricultural industries and related industries) with the advantages and production capacities of agricultural products in each region based on ecological potential and programmable water	Diversify the economy according to the advantages, capabilities and specialties of the land
Establishing proper governance in the agricultural sector with the government's focus on policy-making and facilitation	Agricultural transformation, reform of structure and system of exploitation, and establishment of intelligent and sustainable agriculture by ensuring food security, water and environment
Prohibition of changing the use of agricultural potential lands	
Establishment of conservation agriculture, is accurate, smart, and adaptable to climate change and provides food security	
Strengthening and empowering the National System of Strategic Environmental Assessment (SEA)	Development compatibility with the environment and natural resources
Encouraging investment and supporting the creation, commercialization and use of environmentally friendly technologies	
Develop and implement a program to adapt to climate change in various fields, including water, agriculture and food security, health, tourism, beaches, natural ecosystems, etc.	
Integrated management of environmental critical centers (management of areas affected by land subsidence)	
Reviewing the criteria and criteria for land use change by the ecological characteristics of each territory	
Strengthening and empowering the Environmental Impact Assessment (EIA) system and establishing an audit and monitoring system	
Ambient air quality management in the country, especially in metropolitan areas	
Monitoring and protecting the soil and preventing its erosion, salinization, pollution, and destruction	
Applying the cluster development approach in settlements, industrial, and mining areas	Organizing the establishment of the country's industries and shaping the chain of industrial activities
Strengthening and improving the level of performance and services of cities/cities of Urmia, Ardabil, Zanjan, Sanandaj, Ilam, Khorramabad, Hamedan, Qazvin, Gorgan, Semnan, Arak, Qom, Yazd, Bojnourd, Birjand, Yasuj, Shahrekord, Bushehr Level two	Decentralization and changing the pattern of urban land network from single-center to multi-center and multi-level network
Decentralization and functional refinement of the Tehran metropolitan area by maintaining and developing the function of the capital	
Creating dynamism and strengthening the connection in the multi-level and multi-center network of the residential system by using the ball and bar pattern Zanjan, Qazvin, Fars, Kerman, Yazd, Semnan, Qom, Markazi, Hamedan, Chaharmahal and Bakhtiari, Kohgiluyeh and Boyer-Ahmad, Lorestan provinces: as a multi-center cluster urban network with the approach of developing central locations, stabilizing metropolitan areas, Development of small and medium cities, strengthening of medium and large rural centers	Implementing the optimal model for the development of the residential system in different regions of the land
Preventing the uncontrolled conversion of rural areas into cities	
Strengthening the institutional system and continuous decision-making of urban-rural development in the context of the regional network	Maintaining and absorbing the population in the villages by emphasizing on promoting the dynamism and production nature of the villages

The objectives identified in the land management document of Semnan province have been formulated in several sections: the objectives of the upstream documents, the objectives of the problem, and the objectives of the value, the basic objectives of the planning of Semnan province are as follows:

1. Improving connectivity and strengthening the joint role of the province in the trans-regional transport network
2. Upgrading and transitioning from corridor spatial development to spatial spatial development
3. Promoting spatial and inter-territorial justice in the development process of the province
4. Improving the rate, diversity and productivity of productive and sustainable employment
5. Development of institutional capacities Development and planning of the main actors of the province
6. Reducing and refining the intensity and quality of dependence of economic activities on natural and climatic resources
7. Promoting the sustainability of natural resources, especially water, soil, and desert resources
8. Control and reduce the risk of residential, activity and communication areas against natural hazards.

This document contains 11 territorial strategies and 86 territorial policies. Territorial development policies of the province are based on the strategies developed for the development of the province, which focus on redefining the system of population and activity in the province and form the policy framework for the development of service and production infrastructure. Semnan province planning research studies and utilizing the achievements of physical plan research in Semnan province, the zoning of planning areas in Semnan province; including two macro-western planning areas, to the center of the east, to the center of the city, it is located in the center of Shahroud city. The province has two prominent populations this document has considered different roles and specializations for this area in the study area (Semnan urban area) based on the studied subjects (Figure 5).

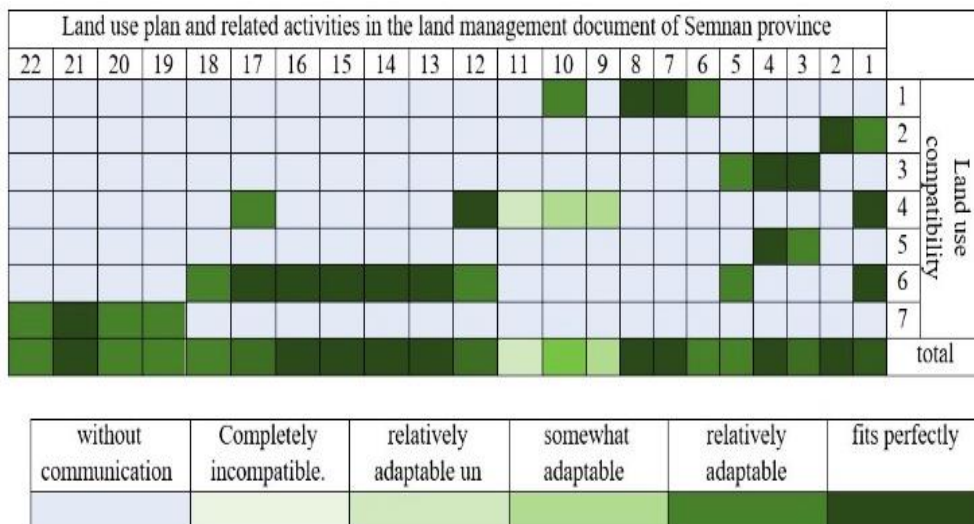


Figure 5. Assessing the compliance of adaptation programs and policies and land use program and related activities in the land management document of Semnan province

5. Conclusion

Regulating the development process of Semnan city based on climatic and environmental considerations with regard to the management of natural hazards and climate changes, improving the level of development sustainability through comprehensive ecological management based on a collaborative approach, emphasizing desertification control, water conservation and soil protection. Air and vegetation, its optimal use, especially in the northern border of Iran, the reality of climate change among the countries of the Middle East and especially Iran is severe. Considering the characteristics of multi-level governance and due to the weakness in the body of the land development system, whether in the field of policy making and performance in the urban area of Semnan in general or the weakness in facing climate changes in the city of Semnan in particular, using New management approaches in this field, such as multi-level climate governance, can be helpful.

The establishment of such a system requires the identification of effective actors and stakeholders and the examination of the capacities and governance methods that can be used in this region and its compatibility with the land development system. Considering the current situation of the Semnan urban area and also because land preparation is considered the most important tool of city managers and policy makers in facing climate changes in the Semnan urban area.

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Author contributions:

Vahid Isazade: Conceptualization, Methodology, Software **Abdul Baser Qasimi:** Data curation, Writing-Original draft preparation, Software, Validation. **Taher Parizadi3:** Visualization, Investigation, **Esmail Isazade:** Writing-Reviewing and Editing.

Conflicts of interest:

The authors declare no conflicts of interest.

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