

## Article

# Localization of the Urban Planning Process with the Knowledge-Based Sustainable Development Approach

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**Abstract:** In recent decades, the concept of a knowledge-based city has been proposed as one of the most important concepts in urban planning. The present study evaluates the ability to localize urban planning indicators in the city of Urmia and determine the desirability of knowledge-based city indicators to provide coherent policies and strategies to achieve sustainable development and a knowledge-based city. Localization is the adaptation of global patterns and methods of development and planning to the internal conditions of the local community. In order to collect data from documents and library studies, experts' opinions have been used by the Delphi method. Then, indicators related to local urban planning and knowledge-based city were extracted. The present study's statistical population is 20 specialists and experts related to the research topic through the survey method. In order to analyze the research data, a one-sample *t*-test was used to assess the ability to localize aspects of urban planning in the city of Urmia. In order to investigate the degree of correlation and factor load of each urban planning indicator, confirmatory factor analysis was used. Using the Swara technique, the desirability and knowledge-based city indicators' priority level has been evaluated and analyzed. The research results indicate that each of the economic, social, physical, environmental, and managerial aspects of urban planning can be localized in the city of Urmia. Moreover, the situation of Urmia in some aspects is in a situation of incompatibility in terms of the feasibility of the knowledge-based city's policies. In order to improve the current situation and achieve the desired goals, suggestions have been made in various aspects.

**Keywords:** localization; urban planning; knowledge-based urban planning; sustainable development



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## 1. Introduction

Today, we are witnessing increasing urbanization and the development of cities in the process of globalization. Rising urbanization has created new markets and intensified competition for access to limited available resources. On the other hand, many metropolises in the process of globalization have become the center of economic and political activity in the world. It is a response to the continued survival of cities in the fierce competition of urbanization. Keeping up with the critical global changes has required cities to look for innovative and new ways to maintain a competitive advantage in global markets. One of these new and innovative solutions is knowledge management in cities. Since the time of human life on earth, knowledge has been a vital source of human progress. However, the explicit and purposeful management of knowledge as a strategic resource is rapidly evolving in the new context today. International organizations today find that the challenges of today's advanced societies require knowledge-based development strategies. International organizations such as the European Commission, the World Bank, the United Nations, and the Organization for Economic Co-operation and Development (OECD) have adopted knowledge management frameworks for global development. It indicates that a new link between knowledge management and knowledge-based development is emerging. In today's world, knowledge has become a precious local and regional resource that social

and economic consequences have strongly influenced. Because regions play a role in knowledge development, knowledge-based cities can foster regional innovation. Thus, the relationship between innovation, competitiveness, and territorial development has led to policymakers' unprecedented efforts at various levels (national, provincial, regional and local) to increase the capacity for effort and innovation [1]. Knowledge is one of the most significant economic and social development forces because it shares with others without reduction or depreciation [2].

The inability of policies based on traditional and top-down approaches in urban development has led to the efforts of urban planners to develop new approaches. Weakness of governance and inefficient institutional frameworks, low institutional capacity, and weak cooperation of stakeholders are among the primary challenges to realizing cities based on urban planning with new approaches. Knowledge-based urbanization is a new approach and paradigm for the sustainability of cities, the ultimate goal of which is to create a knowledge city [1,2]. Achieving urban development knowledge-based depends on achieving; (1) Economic development in order to achieve economic welfare, (2) Social and cultural development in order to achieve social justice, (3) Development of the urban environment in order to achieve a high quality of social and spatial urban life, and (4) Development of urban management governance institution in order to Achieve good urban governance. As a result, knowledge-based urban development is possible by creating coherence and integration between the four components mentioned and the simultaneous and balanced development of those four components. The development of each component requires the development of other parts [3]. Therefore, a city based on knowledge is a city that enhances the importance of all its sectors. This city plays a key role in improving the quality of urban living standards, cultural issues, and economic growth. Cities can better move towards sustainable urban development founded on the principles and standards of knowledge (knowledge-based city). Traditional Iranian architecture and urban planning have been formed by using the conditions and capabilities of each geographical area's natural environment and indigenous culture to provide physical and mental comfort to humans [4].

Localization can empower developing countries if we consider localization as the adaptation of external patterns and methods of development and planning to the local community's internal conditions. Localization will be an institutional link between formal knowledge and indigenous knowledge in practice and its institutionalization during development [5]. Today, it has become clear that other traditional models and methods of practical development of urban areas have not been proposed. Most of the up-to-date techniques appropriate to the local conditions of the region have been emphasized. Knowledge-based urban planning is a new approach in Iranian urban planning that can be a way to solve the existing problems in Iran.

The main concern of the present study is the localization of urban planning with a knowledge-based approach. Therefore, the questions of the present study are: (1) How can urban planning indicators be localized? (2) What is the level of desirability of knowledge-based city indicators in Urmia city to bring the study area closer to the goals and policies of a knowledge-based city? As a result, this study's main purpose is to organize the city of Urmia through localizing urban planning with a knowledge-based approach. The study area of the present study (Urmia city) has flourished with the potential and ability to become a knowledge-based city. For the following reasons; (1) Location in a unique geographical location (location on the communication highway). (2) Enjoyment of significant historical, natural, and ancient heritage. (3) the Existence of extensive educational and research centers, (4) the Existence of macro and micro industrial infrastructures on a regional scale and National. This study tries to determine the compatibility and desirability of knowledge-based city indicators after examining the feasibility of different urban planning dimensions in terms of localization. After identifying the strengths and weaknesses, the present study provides purposeful and practical strategies to strengthen the spatial-functional needs of the knowledge-based city. The main difference between the present study compared with

previous studies is the simultaneous use of knowledge-based city approach indicators and urban planning in the study area of Urmia. In general, the points mentioned the importance of this research.

Furthermore, its innovation is compared with other research efforts to promote theoretical literature on the knowledge-based urban planning approach and its use in indigenous urban planning. (1) In the local field, the city of Urmia is selected for the first time in related studies for specialized analysis and study. (2) Applying critical functional and spatial criteria and requirements of knowledge-based urban planning principles in urban planning and development of Urmia city to achieve a sustainable and knowledge-based city.

## 2. Research Review

Several studies have been carried out in a wider geographical context dedicated to the issue. Yigitcanlar [6] conducted a study examining the city's strategies for knowledge-based urban development. Her research findings show Brisbane is still in the early stages of becoming a city of knowledge. However, the global trend and its achievements in strategic urban development based on knowledge are significant. Yigitcanlar [7] emphasizes the areas of knowledge-based as catalyst infrastructures that affect the production of knowledge in cities. In this study, the increasing importance of the knowledge-based urban approach (KBUD) in the paradigm of a knowledge-based economy and the role of knowledge-based domains as a tool to establish the foundations of knowledge production in cities are discussed. In this study, the increasing importance of the knowledge-based urban approach (KBUD) in the paradigm of a knowledge-based economy and the role of knowledge-based domains as a tool to establish the foundations of knowledge production in cities are discussed. It also examines knowledge-based urban development, particularly the development of knowledge-based areas, and assesses the potential of Sydney, Melbourne, and Brisbane and its benchmarks against Boston and Massachusetts. Sarimin and Yigitcanlar [8] conducted a study to propose a new model that integrates all the critical elements of urban development. This model effectively allows planners and developers to achieve broader and more developed results. Ergazakis et al. [9] examined the achievements of the six prosperous cities of Barcelona, Munich, Stockholm, Montreal, Dublin, and Delft in the field of knowledge-based cities. This research's successful process is as follows: (1) Recognizing the city's current situation to reach a knowledge-based city. (2) Creating a comprehensive operational plan to understand the presented strategies. (3) Implementing the proposed plan will be the commission's responsibility of the city council of a knowledge-based city. (4) Evaluating the plans, reviewing, and measuring the progress of the work.

Rattleb and Kliebert [10] have analyzed the production of highly skilled temporary migrant labor by global capitalism through the technology of special economic zones. The research findings showed transnational education zones constitute a continuation of established strategies for economic development by exception that have been pursued by governments in the Gulf, which aim for global connectivity and rely heavily on controlling a temporary and contingent migrant workforce. The research findings of Matilla et al. [11] showed they argue that ethnographic knowledge would support the aims of communicative planning by bridging the gap between participatory methods and so-called scientific knowledge. They presented some concrete ways to combine communicative practices, ethnographic processes, and traditional scientific knowledge production that aims at neutral and placeless knowledge. The development of sustainable mechanisms for integrating ethnographic knowledge into the structures of urban planning requires further cooperation between ethnographers and planners. Co-operation calls for an enhanced understanding of the nature of ethnographic knowledge in planning institutions and a better understanding of the nature of planning practices in the field of ethnography. The research findings of Zaidan et al. [12] proposed a set of decision constructs aimed at allowing planners, engineers, and investors to have different alternatives at their disposal and select a feasible set of practical solutions for smart transformations accordingly. The research findings of

Salehi and Fontana [13] showed there is a relation between the similarity of results and the similarity of experts' profiles in knowledge-based decision groups of various countries such as Iran and Brazil. The research findings of Ardito et al. [14] showed how universities manage the knowledge management (KM) governance issue when internal knowledge is used, the KM governance issue when external knowledge is used, the KM processes issue when internal knowledge is used, and the KM processes issue when external knowledge is used. Results reveal that universities act as knowledge intermediaries, knowledge gatekeepers, knowledge providers, and knowledge evaluators.

Dadashpour and Yosefi [1] have evaluated the balance of the regions of Iran in the level of knowledge-based development. The research results indicate a severe imbalance between the regions of Iran in terms of knowledge-based development capacity. Moreover, the country's central regions are in a better situation, and as we move around, the situation worsens. Jomehpour et al. [15] have studied the city of Arak in terms of achieving knowledge-based urban development. The research findings showed that the city of Arak has the potential to become a knowledge-based city.

A review of the research literature shows that urban development and the principles of knowledge-based urban planning depend on achieving economic, social, and cultural development, environmental, managerial, and so on. Therefore, integrated development and creating coherence, balance, and coordination among the mentioned developments will realize knowledge-based urban development.

Due to its cultural and historical diversity, the city of Urmia can attract financial and human capital in the field of urban planning. The present research, examining the implementation capabilities of urban planning indicators in Urmia, tries to place the knowledge-based urban planning approach in the urban planning paradigm of Urmia as a smart guide and tool. To bring innovation in urban and regional development and move towards sustainable development of Urmia city.

### 3. Theoretical Framework

The "Knowledge-Based Development Approach" paradigm was first formed in 1995 to revitalize industrial cities in Europe and the United States by enhancing human and institutional capacity and creating enabling environments for creativity, innovation, and education. Since the beginning of the 21st century, the Organization for Economic Co-operation and Development (OECD) has adopted the Knowledge Management Framework as its strategic strategy for global (global + local) development. This strategy establishes a strong relationship between knowledge management and urban development. Knowledge-based urban development is referred to as "KBUD". It is a powerful strategy for economic development and post-industrial development of cities and participation in the knowledge economy [16]. Development means economic growth and all the parameters that reflect the quality of life and sustainability in an international context [17]. A knowledge-based city physically and institutionally combines the functions of science and technology parks in urban functions. A knowledge-based city is functional, a city cultivating knowledge and includes concepts such as knowledge corridors, knowledge villages, and knowledge areas [18].

The main driver of the knowledge-based concept is designed based on knowledge-based services and practices. The term knowledge-based uses knowledge-based activities and strategies and the importance of producing, evaluating, and expanding it in various urban communications. Today, knowledge is one of the most important and valuable assets that must be effectively managed to be used as a competitive advantage in a knowledge-based economy. The influence of the knowledge-based economy, accompanied by rapid technological changes in the scientific fields of information, communication, and transportation, has led to the industry's change to the knowledge age [19].

The concept of knowledge-based was first introduced as economics and as a "knowledge-based economy". It imposed an economic burden on them when it was introduced to other disciplines. The "foundation" of science is particularly important for urban planning and



architecture plans and programs. The characteristics and sources of knowledge required in Iran are different from what are considered in other societies as the characteristics and sources of urban knowledge; Therefore, it demands its [20]. Knowledge management is the process of helping organizations identify, select, organize, and disseminate important information and skills. The main concept of knowledge management is to create and develop strategies that provide the appropriate knowledge to the appropriate people at the right time and place [21].

In the knowledge economy era, cities' performance is complex and a multifaceted phenomenon. The idea of knowledge-based urban development has become widespread in many urban areas to promote aspects of competitiveness, attract talent and capital, and provide high vitality and quality of life for residents [22–25]. A knowledge-based city is a city that aims to develop knowledge-based activities by emphasizing the knowledge-based economy environment [9].

What is important is that the planner deals with people and information flow because communication is the main pillar of knowledge-based cities. Proximity is more important than access because face-to-face communication is most important when it comes to confidential communication [26]. One of the most important goals of the city of knowledge is to provide an environment and conditions that enable the cultivation and creation of knowledge, management of knowledge in the city, effective exchange and transfer of knowledge, and innovation for citizens [21]. A knowledge-based city is functional, a city cultivating knowledge and includes concepts such as knowledge corridors, knowledge villages, and knowledge areas [18] (Figure 1).

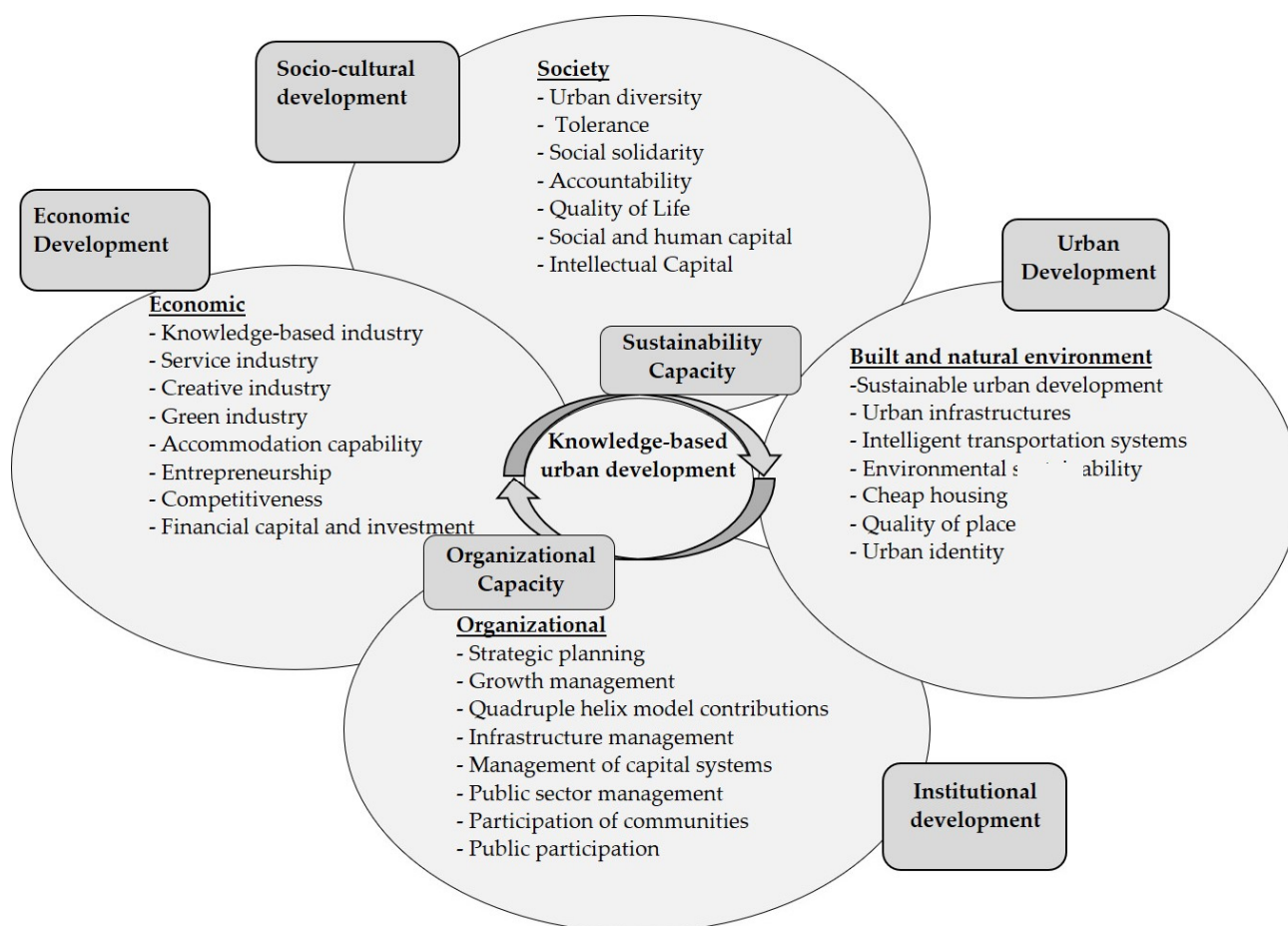


Figure 1. Knowledge-based urban development areas [6,15].

The planner must deal with people and information flow because communication is the main pillar of knowledge-based cities. Proximity is more critical than access because face-to-face communication is most important for confidential communication [26]. One of the most important goals of the city of knowledge is to provide an environment and conditions that enable the cultivation and creation of knowledge, management of knowledge in the city, effective exchange and transfer of knowledge, and innovation [21].

The knowledge-based city is considered a city that seeks knowledge-based development by continuously creating knowledge, sharing knowledge, evaluating knowledge, reviewing, and updating knowledge [18]. According to Edvinsson, a “Knowledge City is a city designed to enhance knowledge development”. These cities invest more in education and research than other cities with advanced economies. Carillo’s definition of knowledge-based cities is as follows: A knowledge-based city is where citizens systematically try to identify and develop the capital system in a sustainable and balanced way [19]. Therefore, knowledge-based urban planning means using internal knowledge, avoiding external knowledge, paying attention to the past, and combining it with future science. Knowledge-based urban planning seeks to respond to internal needs with an internal pattern and for the existing environment in the present place and time [27].

Localization can mean synchronizing each phenomenon with its environment and context. The vernacular usually has all the components needed for the phenomenon and will rarely require off-canvas components. In other words, each vernacular, in general, supports and protects the dependent native phenomenon and meets its needs in all aspects [28,29]. Localization is understood as how society responds to a transformation from traditional to modern and how it deals with the inward-oriented society’s interaction with the external society. What has highlighted the issue of localization in recent years is the fact that borrowing the methods and experiences of others without considering the differences between communities, cultures, and spaces cannot lead to sustainable development in these communities [5].

With a brief look at Iran’s vast country, different climatic and cultural regions can be identified. Based on the UNEP climate classification, more than half of Iran is represented by the climate type “arid” (52.85%), while 34.26% is occupied by the climate type “semi-arid”, and 6.95% has climate type “dry”. The climate types “humid” and “sub-humid” also occupy 3.98% and 1.65% of the country [30]. The localization of national building regulations (meaning a return to each region’s indigenous principles and patterns, the indigenous features, and components of each region) can contribute to the current crisis and lead the confusion about coherence, order, and beauty. Localization must be performed in design, construction methods, construction materials and products, installation affairs, exploitation, and uses [28]. Localization does not mean going back in time or closing the door to change and innovation [5].

#### 4. Materials and Methods

The collection of information and data required in this research has been performed using the library and documentary method. (1) the Delphi method is used in two steps. In the first stage, by conducting face-to-face interviews and opinion polls with experts and specialists and studying documents and related research, actions have been taken to identify and achieve urban planning indicators. Then, the initial indicators were screened by a survey of experts. From them, the main economic, social, physical, environmental, and managerial indicators were selected. (2) a questionnaire of indicators has been prepared to assess the city of Urmia’s desirability regarding local indicators of urban indicators planning to use the Likert scale. The questionnaire is a structured one. This questionnaire was distributed among 20 specialists and experts related to the subject (university professors, executive managers in housing and urban planning, deputy mayor of urban planning, municipality, planners, and researchers). In order to select the respondents, the main people related to the issue have been identified among the academic elites according to their research resumes. Then, with their opinions, the most relevant people

in the discussion and research were identified. In order to measure the reliability of the questionnaire, Cronbach's alpha coefficient was examined in SPSS software. According to the results, Cronbach's alpha coefficient for this study is 0.948, so the questions asked in this questionnaire have the necessary reliability. In the present study, due to the use of various indicators and components of the study approaches of urban planning and knowledge-based urban development, quantitative techniques and tests should be used to determine the environmental conditions of the study area. The methods and tools used have been selected and determined with emphasis on the features of correct evaluation ability, novelty and accurate measurement of the proposed questions, and determination of the status of the study subject. The quantitative methods and techniques of the present study have been chosen by the study objectives and are in line with answering the common questions. In this regard, in order to measure the localization capability of each of the components of urban planning in Urmia city, a one-sample *t*-test was used in SPSS software, and in order to calculate the correlation and compatibility levels of each of The components, are also used by the confirmatory factor analysis in the Smart PLS test. In the following, in order to calculate the levels of desirability and determine the preference and priority of each of the indicators of the knowledge-based city in the studied area based on the degree of desirability of each one, the Swara technique has been used until the weak, and strong points have been identified and appropriate to it. Excellent and optimal proposals, programs, policies, and actions have been presented to improve the environmental situation and achieve an ideal society. (SWARA) method is one of the new methods of multi-criteria decision-making that was used in 2010 to develop the reasonable difference analysis method between criteria. In this method, each expert determines the importance of each criterion according to his implicit knowledge, information, and experiences, so that the most important criterion will be ranked first and the least important will be ranked last, then with Considering the average value obtained for each criterion by experts, the weight of each criterion is determined. SWARA is based on expert opinions and is a complete judgmental method. In this method, experts can consult each other. This consultation makes the results more accurate than other MCDM methods. The SWARA method is simple and understandable, and less complicated compared to methods such as AHP and ANP [31–34].

Using a one-sample *t*-test in SPSS software to assess which of the factors can be localized in Urmia. To investigate each item's correlation and factor load with the desired dimension, confirmatory factor analysis by PLS Smart software was used. The Swara technique has been used to identify strengths and weaknesses to determine the level of desirability and preference of each knowledge-based city indicator in the study area.

#### *4.1. Indicators Related to Research*

One of the most important concerns of today's urban planning is the localization of urban planning indicators by the city's characteristics and features in all physical, economic, Etc. Indicators play an essential role in making informed decisions at all levels of the city. Evaluation and recognition in the study area require the development of indicators to measure the degree of desirability or non-desirability and determine the importance of each indicator to improve the current situation. In this research, the theories of various thinkers and experts in urban planning have been studied through the theoretical foundations and existing library documents to identify and determine each of the indicators. The issue of localization of indicators in a city is the basis of the urban planning process. Indicators of effective urban planning in evaluating Urmia's localization, which plays a key role in urban planning, are classified in Table 1. Through field analysis and studies on some of the research, appropriate indicators of the knowledge-based city approach to assess the study area's status have been identified and extracted in Table 2.

**Table 1.** Urban planning indicators.

Aspects	Indexes	References
Economic (E)	Accessibility to innovation and creativity centers (E <sub>1</sub> ), Organizing festivals and exhibitions of handicrafts (E <sub>2</sub> ), The average price and rent (E <sub>3</sub> ), The structure of the basic activity of the city (E <sub>4</sub> ), Average household income (E <sub>5</sub> ), City products (E <sub>6</sub> ), The quality of transport network (E <sub>7</sub> ), Cost of educational and research projects (E <sub>8</sub> ), Reducing migration (E <sub>9</sub> )	[35–38]
Social (S)	Individual and social security (S <sub>1</sub> ), Proper access to the cultural structure (S <sub>2</sub> ), Customs (S <sub>3</sub> ), Values and local shows (S <sub>4</sub> ), Spatial dependence and social participation (S <sub>5</sub> ), Population density and its fair distribution (S <sub>6</sub> ), public education (S <sub>7</sub> )	[39–42]
Physical (P)	Readability and security of urban space (P <sub>1</sub> ), The quality of the street network (P <sub>2</sub> ), Accessibility to infrastructure (P <sub>3</sub> ), Easy accessibility to scientific and research centers (P <sub>4</sub> ), The density and mass of the building (P <sub>5</sub> ), Reputation of urban spaces (P <sub>6</sub> ), Skyline (P <sub>7</sub> )	[39,43–45]
Environmental (L)	Air pollution (L <sub>1</sub> ), Slope and topography (L <sub>2</sub> ), Vegetation (L <sub>3</sub> ), Visual and environmental quality (L <sub>4</sub> ), City sewage (L <sub>5</sub> ), Disposal of surface water (L <sub>6</sub> ), Disposal of municipal waste (L <sub>7</sub> ), Dominant wind (L <sub>8</sub> ), Energy efficiency (L <sub>9</sub> ),	[37–41,46]
Managerial (M)	City brand (M <sub>1</sub> ), public participation in the decision-making process (M <sub>2</sub> ), public and private participation (M <sub>3</sub> ), social cohesion and equality (M <sub>4</sub> ), interaction	[35]

**Table 2.** Knowledge-based city indicators.

Aspects	Index	References
Economic Development (e)	Number of large international companies (e1), foreign direct investment (e2), urban competitiveness (e3), development and research costs (e4), economic innovation (e5), research And development (e6), patent application rate (e7), number of knowledge workers (e8), international travelers (e9), knowledge workers (e10), knowledge intensive services (e11) affordable housing (l5), cost of living (l6),	[47–51]
Social and cultural development (c)	Cultural diversity (c1), University reputation (c2), Educational investment (c3), Educational achievements (c4), Number of students (c5), Unemployment (c6), Access to bandwidth (c7), Vocational skills base (C8), social and economic dependence (c9), number of international publications (c10)	
Environmental development (l)	Urban shape and density (l1), use of sustainable transportation (l2), quality of life (l3), personal security (l4), number of urban development projects (l7), Sustainable Urban Development (l8), Environmental Sustainability (l9)	
Organizational and managerial development (o)	City brand (o1), public participation in the decision-making process (o2), public-private partnership (o3), social cohesion and equality (o4), social interaction (o5), e-government (o6), use City promotion strategies (o7), income inequality (o8)	

#### 4.2. Case Study

With an area of 11,237 hectares, the city of Urmia is the capital of West Azerbaijan province, which is located 18 km from Lake Urmia. According to the latest population and housing census in 2016, this city's population was 736,224 people, and this city is divided



into five regions [52–54]. Urmia has historically had the first medical training center, the first modern hospital and school, the first television network, and the first local publication. As the study area of the present study, the city of Urmia has the necessary conditions for the localization of urban planning indicators and becoming a knowledge-based city for the following reasons: (1) Having numerous university centers and public libraries. (2) Being in the middle of Urmia plain. (3) Existence of lush gardens and dense agricultural lands around the city and suitable climate characteristics. (4) Strategic position for the neighborhood with countries and locations at the crossroads of the Caucasus, Mesopotamia, Asia Minor, and east of Lake Urmia. (5) Existence of several access centers, including an international airport. (6) Multi-ethnic city with the presence of different religions, ethnicities, and religions. (7) Protection of cultural and indigenous identity originality (emphasis on the school of indigenous and traditional music) and (8) Enjoying favorable business and commercial conditions (special economic zones). Figure 2 shows the geographical location of Urmia.

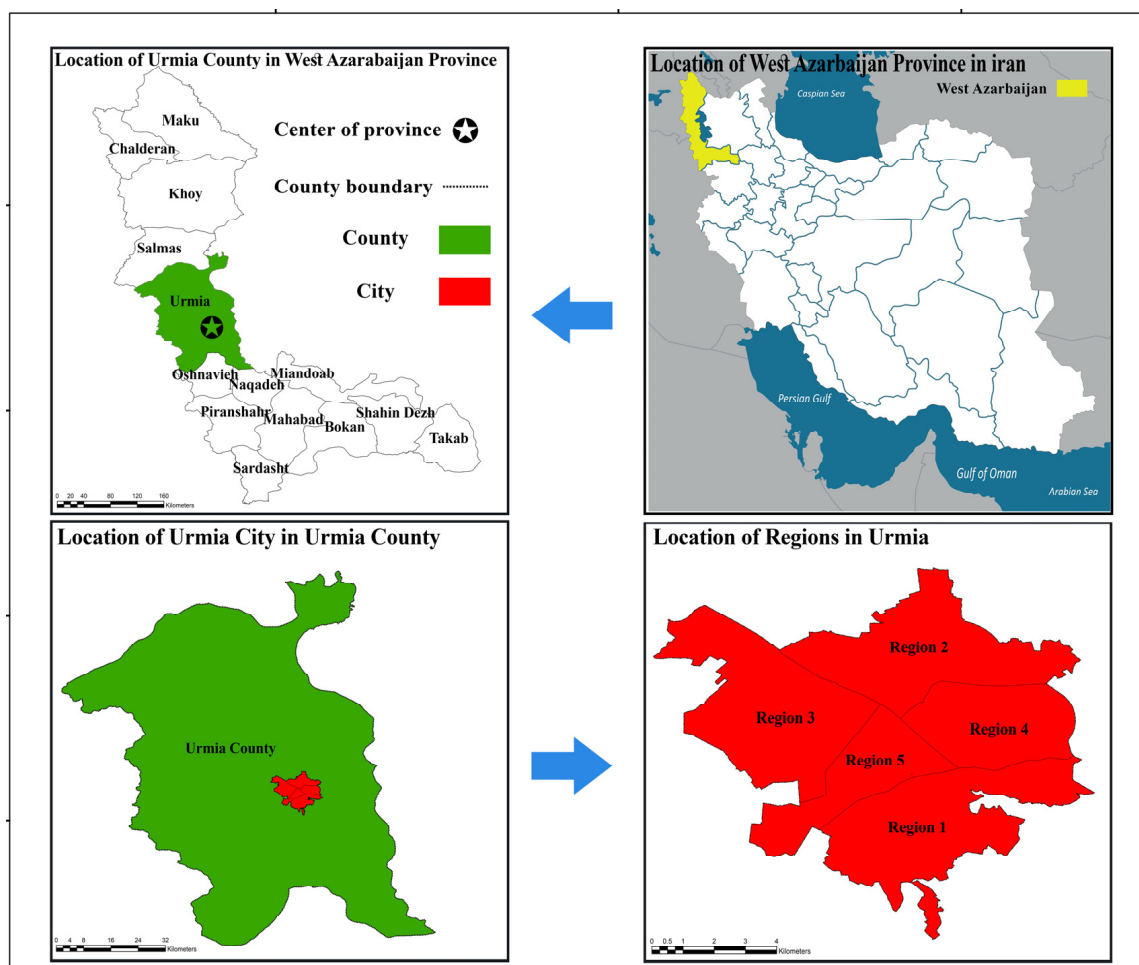


Figure 2. Spatial Structure of case study [53,54].

## 5. Results

This study's primary purpose is to assess the feasibility of localization of urban planning in Urmia in different aspects. The present study tries to analyze the main indicators of the knowledge-based urban planning approach in Urmia's urban planning process. Finally, the present study should provide purposeful suggestions to strengthen the goals, strategies, and policies related to knowledge-based urban planning. In order to meet the mentioned goals, a one-sample *t*-test, confirmatory factor analysis method in Smart PLS software, and Swara technique have been used. Cronbach's alpha coefficient was used

to evaluate the validity and reliability of the questionnaire. According to the findings, Cronbach's alpha coefficient for all questions of the questionnaire shows 0.94. This number indicates that the validity coefficient of the questionnaire is at a very good level. Cronbach's alpha coefficient is 0.87 for the economic criterion, 0.78 for the social criterion, 0.64 for the physical criterion, 0.92 for the environmental criterion, and 0.81 for the managerial criterion. However, Cronbach's alpha coefficient for the physical criterion is moderate. Therefore, the questions raised in this questionnaire have the necessary reliability and validity. In the parametric statistical test, the mean of the sample (mean of compatibility of urban planning indicators in Urmia) and the assumed mean were compared with the value of 3 (mean of the middle spectrum of the compatibility of urban planning indicators), which is the average value. The results of the sample *t*-test are as follows in Tables 3 and 4.

**Table 3.** Sample *t*-test results.

One-Sample Statistics				
Aspects	N	Mean	Std. Deviation	Std. Error Mean
Economic	20	3.6778	0.7054	0.157
Social	20	3.7286	0.64872	0.145
Physical	20	3.75	0.4394	0.098
Environmental	20	3.6708	0.71557	0.16
Managerial	20	3.78	0.68641	0.153

**Table 4.** Sample *t*-test results.

One-Sample Test						
Aspects	Test Value = 3					
	<i>t</i>	Df	Sig. (2-Tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Economic	4.297	19	0	0.677	0.347	1.007
Social	5.023	19	0	0.728	0.425	1.032
Physical	7.633	19	0	0.75	0.544	0.955
Environmental	4.193	19	0	0.67	0.335	1.005
Managerial	5.082	19	0	0.78	0.458	1.101

The results of the one-sample *t*-test for five aspects indicate that at the level of 99% confidence (significance level less than 0.01), a significant positive difference between the average of economic indicators (0.67), social (0.72). There are physical (0.75), environmental (0.67) and managerial (0.78) in Urmia and average (3). Therefore, all urban planning indicators mentioned in the present study in the city of Urmia can localize.

Confirmatory factor analysis is used to measure concepts (latent variables). The most important goal of confirmatory factor analysis is to determine a predefined operating model's power with observed data. In other words, confirmatory factor analysis seeks to determine whether the number of factors and loads of the variables measured on these factors are consistent with what was expected based on the theory and theoretical model. Therefore, confirmatory factor analysis examines the relationship between latent (main) variables and observed variables (questionnaire items). In Table 5, each item's factor times are specified according to the specified aspects.

**Table 5.** Factor load results.

Aspects	Item	Factor Load	Item	Factor Load	Item	Factor Load
Economic	E <sub>2</sub>	0.904	E <sub>4</sub>	0.755	E <sub>3</sub>	0.652
	E <sub>6</sub>	0.829	E <sub>7</sub>	0.755	E <sub>1</sub>	0.642
	E <sub>5</sub>	0.779	E <sub>9</sub>	0.659	E <sub>8</sub>	0.465
Social	S <sub>3</sub>	0.812	S <sub>4</sub>	0.681	S <sub>7</sub>	0.463
	S <sub>1</sub>	0.749	S <sub>6</sub>	0.68		
	S <sub>5</sub>	0.699	S <sub>2</sub>	0.547		
Physical	P <sub>6</sub>	0.721	P <sub>3</sub>	0.541	P <sub>2</sub>	0.453
	P <sub>1</sub>	0.718	P <sub>7</sub>	0.498		
	P <sub>4</sub>	0.568	P <sub>5</sub>	0.468		
Environmental	L <sub>3</sub>	0.92	L <sub>8</sub>	0.745	L <sub>1</sub>	0.645
	L <sub>4</sub>	0.915	L <sub>9</sub>	0.743	L <sub>2</sub>	0.611
	L <sub>5</sub>	0.893	L <sub>10</sub>	0.735	L <sub>11</sub>	0.6
	L <sub>12</sub>	0.772	L <sub>7</sub>	0.667	L <sub>6</sub>	0.554
Managerial	M <sub>1</sub>	0.875	M <sub>5</sub>	0.855	M <sub>4</sub>	0.581
	M <sub>3</sub>	0.857	M <sub>2</sub>	0.61		

According to the factor coefficient table results, all components have a factor load greater than 0.3 and a t-statistic greater than 1.96. Therefore, all the questionnaire questions had the necessary validity, and none of the questionnaire questions were deleted. Moreover, the result of factor loads show that the second item: (holding festivals and handicrafts exhibitions) has the highest correlation with the economic index (0.9), and item 12: (customs) has the highest correlation with the social index (0.81) and item 22: (reputation of urban space) has the highest correlation with the physical index (0.72) and item 26: (vegetation) has the highest correlation with the environmental index (0.92), and item 36: (Social responsibility and participation) has the highest correlation with the management index (0.87). Moreover, according to the results, the components; (1) building density and volume. (2) surface water disposal and regular skyline. (3) organizing the network of roads for easy access to scientific and research centers. (4) and financial support for its achievements are among the urban planning strategies. The physical, environmental and economic aspects are at the lowest level of correlation.

The research findings indicate that according to the Swara method, Urmia city's social and cultural development components have been more favorable than other dimensions. In recent years, the feature of having electronic services in urban exchanges (especially the areas related to planning issues and urban management systems) has been the most important factor determining the "electronic government" component, with a weight of 0.491 as desirable. It has been the most important component (Table 6).

**Table 6.** Final results of weighing the research criteria by the Swara method.

Final Rank	$W_j = q_j / \sum q_j$	$q_j = q_j - 1/k_j$	$K_j = S_j + 1$	$S_j$	Total Points	Superiority of Components
1	0.491	1	1	0	176	$\alpha_6$
2	0.248	0.505	1.977	0.977	172	$e_6$
3	0.126	0.257	1.965	0.965	166	$C_3$
4	0.066	0.135	1.898	0.898	149	$l_7$
5	0.033	0.068	91.98	0.98	146	$C_{10}$

Table 6. Cont.

Final Rank	$W_j = q_j / \sum q_j$	$q_j = q_j - 1/k_j$	$K_j = S_j + 1$	$S_j$	Total Points	Superiority of Components
6	0.016	0.034	1.979	0.979	143	C <sub>7</sub>
7	0.008	0.017	1.993	0.993	142	C <sub>5</sub>
8	0.004	0.008	1.993	0.993	141	e <sub>2</sub>
9	0.002	0.004	1.986	0.986	139	o <sub>2</sub>
10	0.001	0.002	1.978	0.978	136	l <sub>3</sub>
11	0	0.001	1.993	0.993	135	o <sub>5</sub>
12	0	0	1.993	0.993	134	e <sub>1</sub>
13	0	0	1.993	0.993	133	o <sub>7</sub>
14	0	0	1.992	0.992	132	e <sub>5</sub>
15	0	0	1.992	0.992	131	l <sub>6</sub>
16	0	0	1.992	0.992	130	o <sub>3</sub>
17	0	0	1.992	0.992	129	l <sub>5</sub>
18	0	0	2	1	129	e <sub>7</sub>
19	0	0	1.992	0.992	128	c <sub>2</sub>
20	0	0	1.984	0.984	126	e <sub>8</sub>
21	0	0	1.992	0.992	125	e <sub>3</sub>
22	0	0	1.992	0.992	124	e <sub>10</sub>
23	0	0	2	1	124	l <sub>4</sub>
24	0	0	1.967	0.967	120	l <sub>2</sub>
25	0	0	1.991	0.991	119	c <sub>8</sub>
26	0	0	1.991	0.991	118	e <sub>9</sub>
27	0	0	1.983	0.983	116	o <sub>1</sub>
28	0	0	1.991	0.991	115	e <sub>4</sub>
29	0	0	1.991	0.991	114	c <sub>4</sub>
30	0	0	1.894	0.894	102	o <sub>8</sub>
31	0	0	1.931	0.931	95	c <sub>9</sub>
32	0	0	1.915	0.915	87	l <sub>1</sub>
33	0	0	1.977	0.977	85	c <sub>6</sub>
34	0	0	2	1	85	o <sub>4</sub>
35	0	0	1.941	0.941	80	e <sub>12</sub>
36	0	0	1.987	0.987	79	e <sub>13</sub>
37	0	0	1.835	0.835	66	e <sub>11</sub>
38	0	0	1.681	0.681	45	c <sub>1</sub>

One of the most important actions that have been carried out in realizing knowledge-based urban development strategies and policies in Urmia city is (1) Increasing the amount of research and development in various urban affairs. (2) Increasing the amount of investment in different levels and fields of education. (3) Emphasizing the important role of the environment in urban issues and strengthening its compatibility in planning different urban levels. (4) Increasing the number of international scientific publications during the past years. (5) Increasing the number of international students due to the strategic geographical location. (6) Attention to the amount of foreign direct investment. Urban branding is an important concept that has always contributed significantly to the city's

constant development and sustainability. The specific geographical location of Urmia city (bordering neighboring countries) is a unique feature that can strengthen business branding in Urmia city by promoting its practical strategies and policies in economic dimensions. Some factors are an unfavorable situation based on the opinions of the statistical research community: (1) The components of the existence of cultural diversity. (2) Intensive services based on knowledge. (3) High cost of living and affordability of housing. (4) The social and economic dependence level among different ethnic groups in the city. (5) Social cohesion and equality (social justice) and unemployment rate (Table 6).

## 6. Discussion

Each city has various land uses that together form the urban context. The city's communication networks form the city's main skeleton and make up less than one-third (1/3) of the total urban land area. Regular urban form is affected by the quality of road networking. The role of transportation is the most important role of urban thoroughfares (especially in provincial capitals, due to the volume of traffic). In the present study, according to its purpose, strengthening the capacity and potential of access to scientific and research centers will impact the future development of Urmia.

According to the Swara method, findings indicate that aspects of Urmia's social and cultural development were more favorable than other aspects. In recent years, the availability of e-services in urban exchanges (especially in areas related to planning issues and urban management systems) is the most important factor that determines the component of "e-government", with a weight of 0.491 as the most desirable situation among other components. The most important measures taken to realize the strategies and policies of knowledge-based urban planning in the city of Urmia are: (1) Increasing the amount of research and development in various urban affairs. (2) Increasing the amount of investment in different levels and fields of education. (3) Emphasizing the important role of the environment in urban issues and strengthening its compatibility in planning different urban levels. (4) Increasing the number of international scientific publications during the past years. (5) Increasing the number of international students due to its strategic geographical location and paying attention to foreign direct investment.

Urban branding is an important concept that has always played a significant role in urban sustainability. The particular geographical location of Urmia (bordering on neighboring countries) is a unique feature. A useful step can be taken in the city's commercial branding by promoting its strategies and practical policies in economic aspects. Moreover, Factors that, according to the views of the statistical population of the research, are among the weaknesses in the study area and are in an unfavorable situation are (1) Components of cultural diversity. (2) Intensive knowledge-based services. (3) The high cost of living and affordable housing. (4) Level of social and economic dependence between different ethnic groups in the city. (5) Social cohesion, equality (social justice), And 6-unemployment rate.

In the contemporary era, when different societies are facing many crises, including the crisis of cultural identity, how to interact and face each other, and the interaction or clash of cultures, the country of Iran has a particular geographical position throughout history in terms of the diversity and plurality of rituals and customs. In addition, sediment. Due to the new nature of the research topic, very limited research has been conducted in this field in Iran, so it is impossible to analyze the results of the research findings in a comparative manner. Tabibi and colleagues [55] concluded their research that innovation is one of the main pillars of knowledge-based cities. One of the results of innovation zones is the formation of knowledge-based cities. Therefore, cities-regions are centers of growth and centers of knowledge. The innovation process deals with the issue of what turns knowledge into value and is created through complex mutual relationships in an institutional environment. In other words, the main elements of this complex are universities, industry, and government. If this relationship is established properly, the development will be achieved through knowledge-based cities and regions. The global experiences mentioned are also indicative of this fact. Dehghani and his colleagues [56] concluded in their study that the



realization of a knowledge-based city in the planning of urban communities depends on the pursuit of common interests and the implementation of common measures between different stakeholders. Proportional analysis of the critical stakeholders of the knowledge-based city is a suitable tool for capacity building, networking, and promoting participation and interaction between them in the policy-making process. In other words, without the broad participation and interaction of all key stakeholders, it is challenging to achieve a knowledge-based city. So, by explaining the mentioned cases, the main importance and necessity of the present study become clear, which seeks to investigate and analyze all the dimensions and components of the knowledge-based city in the urban society of Urmia city, based on the findings and capabilities. For urban planning executives, the knowledge-based city's realization level should be determined. The findings of the study of Sabatini-Marques et al. [57] reveal that Florianópolis' innovation ecosystem has a high potential to thrive, but the city still has structural issues to deal with first related to the gap between the potential to grow and acknowledgment from key actors of the city to support the overall territory development considering the complex dimensions. This issue suggests amplifying the ecosystem's vision, including different sectors and, especially, addressing innovation for the common good.

The research of Hu et al. [58] identifies the possibility of knowledge dissemination and innovation. This work investigates the key factors encouraging the development of a knowledge-based city for Helsinki, Melbourne, and Hsinchu in terms of economy, society, environment, and management and observes that the progressive and positive circular stimulation for a city requires not only the cultivation of human capital but also the construction of social environment and internal relations to form a high-density knowledge network. Comparing the results with other mentioned research shows that each dimension of knowledge-based cities has a different degree of importance compared to the field under study.

Emphasizing and reviving the region's culture and customs is one of the most important components proposed by experts for social criteria in the region. West Azarbaijan province and the city of Urmia, with more than 3000 years of history, have always been the habitat of various ethnicities and cultures that have influenced each other. The city of religions, sects, and ethnicities is one of the important titles of this city. The people of Urmia's culture have been formed with various social, geographical, historical, and cultural factors and under various perspectives. It has created an independent and unique species. The most important factors that have played a significant role in forming the region's unique culture are (1) Ethnic-religious characteristics. (2) Language, (3) Beliefs. (4) Celebrations and holidays. (5) Mourning and mourning, (6) Emotions, attachments, and social values, and (7) Religious views.

The development of internal economic knowledge is one of the important indicators in knowledge-based urban planning. Therefore, creating conditions to benefit the region's local economy is one of the basic strategies to achieve this index. Establishing local and national festivals and exhibitions in Urmia, which represent the local economy, is one of the main ways to grow and develop the local economy. Strategic techniques for improving the quality and quantity of exhibitions include: (1) Creating a competitive atmosphere. (2) Supporting a group of citizens and executives of these exhibitions. (3) Benefiting from creativity to promote and brand. (4) Improving the level of information and awareness in the community. (5) Measuring the reaction of the clients. In recent years, establishing special exhibitions and festivals has become a strong component in developing the local economy. This component has contributed to the growth and development of policies, such as (1) Introducing the landscape of the region. (2) Preserve and promote the indigenous traditions of the region. (3) Strengthening the cultural and social identity of the region. (4) Creating social solidarity. (5) Increasing local prestige. (6) Improving the quality of life. (7) Creating motivation in the community. (8) Showing the thoughts of the indigenous people of the region. (9) Showing new production patterns in different sectors such as agriculture, industry, etc. (10) Attracting tourists and developing tourism.

Urban spaces where all social groups are present actively affect our lives. Urban public spaces are the best choice for the establishment of special urban arts. The experience of place for citizens represents the meaning of place. Therefore, the relationship between people and urban places interprets the experience of a place. Therefore, physical changes in urban spaces can affect the type of communication and behavior of citizens. The existence of urban arts has effects such as (1) Improving the visual quality of urban spaces. (2) Creating diversity and identity, (3) Enhancing vitality, readability, and (4), most notably, urban space's reputation. Urban public areas in Urmia (such as; forest park, the green corridor of Shahr Chai, recreational places such as Sirdaghi and JadeBand, and historical and cultural places where collective life takes place) in order to achieve the goal of "creating the reputation of urban spaces" and "urban branding", are considered to be the most significant goal, which highlights the need for attention and emphasis of urban planners and designers on these areas.

In addition, it should be mentioned that in the research related to the subject and study approach of the present research, only the examination and analysis of the levels of importance and compatibility of the components and dimensions of the knowledge-based urban development approach in various urban settlements is enough. In the present study, firstly, the feasibility of the dimensions and components of the urban planning approach in an urban environment (Urmia) has been measured, and according to those levels of correlation, compatibility, and desirability of each one, it has been examined. Then, by determining the levels of priority and importance of the dimensions and components of the knowledge-based urban development approach in the urban environment of Urmia, the situation and environmental conditions have been determined, which are appropriate to provide optimal and targeted proposals actions, policies, and programs in In order to improve the existing conditions and achieve an ideal situation, efforts have been made.

## 7. Conclusions

In recent decades, the topic of growth and development of urban knowledge in various fields has entered urban studies. Analysis of experiences in urban development shows that special attention has been paid to the role and impact of knowledge, creativity, and innovation in urban planning in recent decades. A knowledge-based city is one of the latest and most influential achievements of urban areas that try to develop various knowledge and skills in various aspects of the city. Urban planning should emphasize applying knowledge-based development strategies (knowledge-based city) in the executive aspect for cities to develop. The knowledge-based urban planning approach has made a significant contribution to balancing and resolving urban and regional conflicts and inequalities. Knowledge-based urban planning can be a new and clear path to solving many urban planning problems in Iran.

The present study uses the research literature to identify the status of Urmia city in terms of the desirability of knowledge-based city indicators and assess the ability to localize the urban planning process (with emphasis on knowledge-based urban planning in economic, social and physical, Environmental, and managerial aspects) are addressed. In the quantitative analysis of the present study, one-sample t-methods and confirmatory factor analysis were used to assess the ability to localize urban planning indicators and determine each level of desirability. The Swara technique was used to determine the status of knowledge-based city indicators and the level of achievement of knowledge-based development. Analysis of urban planning indicators (to determine the level of desirability of each aspect of urban development and localization) and knowledge-based city (to assess the level of feasibility of each component and determine the position of the city based on having Characteristics of the city based on knowledge) is the main feature of the present study.

The research findings showed that urban planning indicators in the city of Urmia in five economic, social, physical, environmental, and managerial aspects could be localized. However, in some aspects studied, there were basic deficiencies and needs. Comprehensive

development will be achieved if their quantitative and qualitative conditions are improved and upgraded. Moreover, according to the Sawara technique results, there are some shortcomings and weaknesses in the components of the knowledge-based city. According to the findings, among the urban planning indicators, the physical aspect of Urmia is not in good condition. Moreover, among the indicators of the knowledge-based city, the environmental aspect has been unfavorable. It requires the need to plan and provide principled, specialized proposals consistent with the study area's conditions.

#### *Suggestions for Empirical Research*

Some of these suggestions and basic strategies in various fields are mentioned.

In the field of urban planning:

- Improving the road network's quality and facilitating access in the city (especially scientific and research centers). (with emphasis on the physical dimension)
- Emphasis on the desirability of urban density and prevent the emergence of anomalies in urban buildings' volume. (with emphasis on the physical dimension)
- Organizing the skyline situation in the main transportation axes to strengthen the city's landscape quality. (with emphasis on the physical dimension)
- Improving the quality and quantity of scientific and research centers to strengthen public education and strengthen citizens' culture and information. (with emphasis on the physical dimension)
- Supporting the cost of educational and research projects and utilizing internal and specialized knowledge, economic knowledge, initiative, and innovation. (with emphasis on the physical dimension)
- Organizing the problems in the surface water disposal system of the city and strengthening the network of urban sewers, as well as proper and targeted disposal of sewage and urban waste, relying on environmental sustainability (with an emphasis on the environmental dimension)

In the field of knowledge-based urban planning:

- Providing development and research costs increases the sense of interest and create competition between experts, specialists, and citizens. (with an emphasis on the environmental dimension).
- Eliminate inequalities in terms of income and provide practical policies and strategies to establish economic justice. (with an emphasis on the environmental dimension).
- Emphasis on the factor of social equality in having urban services and facilities and benefiting from internal human and financial capital. (with emphasis on the physical dimension)
- Strengthening the indigenous identity and promoting the unique culture and customs of the region. (with emphasis on the physical dimension)
- Improving and promoting knowledge-based intensive services such as; Organizing exhibitions and scientific and research workshops, access all citizens of the city to various communication technologies, creating a link between the achievements of scientific and research centers with different parts of the city, including industry, etc. (with emphasis on the physical dimension)
- Emphasizing the use of appropriate and principled construction patterns and the use of durable and high-quality structures in order to improve the durability of buildings (with an emphasis on the physical dimension)
- Strengthening and improving the per capita level of performance and cultural uses in the city of Urmia and facilitating access and enjoyment of its services (with an emphasis on the physical dimension)
- Development of the necessary infrastructure facilities in order to strengthen the functionality in the city of Urmia and meet the necessary needs in the field of urban land use (with an emphasis on the physical dimension)

- Emphasizing the adoption and application of effective and targeted policies in order to reduce all types of environmental pollution (including air) (with an emphasis on the environmental dimension)
- Creating and developing the vegetation factor with the approach of strengthening the per capita level of green space and vegetation, etc. (with an emphasis on the environmental dimension)
- Emphasis on the organization and improvement of the quality level of the wall and the state of the visual quality and landscape of the main urban spaces of Urmia (with priority in the city center) (with an emphasis on the environmental dimension)

The limitation of the present research is the number of experts involved in the research. Future research can use more experts. Moreover, future research should use more sophisticated Multi-Criteria Decision Making (MCDM) methods. Repetition of the present research in other cities of Iran and developing countries can also be useful.

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