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Proposed Criteria for Selecting Cities of Urban System in Iraq, a Case Study of Salah al-Din Governorate

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ABSTRACT

The objective of this paper is to put some criteria for selecting group of cities in Iraq to formulate a rational urban system in it. The main challenge facing our urban system is the spatial duality which means unbalanced urban system. Moreover urban system in Iraq is suffering from many problems such as: urban concentration in one or two primate cities, rapid urbanization growth, in addition to, lack of infrastructure networks in urban areas and economic problems due to the failure of urban development policies. The choice of a city to be one of the cities of an urban system is governed by many criteria, in other word; the selected city is function of many factors like the population size, economic potentialities, functional relationships, suitable location, and so these factors were the main criteria of selecting cities for the Iraqi urban system. The findings of the research were three cities selected from salah al-Din governorate to be poles of the Iraqi urban system after chosen other cities from other governorates depending upon the same process and criteria. Depending on the previous conclusions, some recommendations may be necessary to enhance the advantages of these criteria in correcting the spatial duality represent with, focusing on the economic aspects of the sizes of cities is deeply needed , great attention must given to identify the three urban systems (the national system , the regional system, and local system), as well as develop long-term strategy of urbanization in Iraq, more coordination between urban policy and other policies is needed , develop a new structure for urban and regional planning at national ,regional ,and local level.

Keywords: Proposed criteria, urban system, selecting cities, Salah al-Din, Iraq.

1. Introduction

Investments in developing countries were concentrated in one or two cities consequently; unbalanced urban systems were the resultant of such policies, so the urban system in these countries characterized with spatial duality. The process of spontaneous

growth lead to a state of urban concentration (dominance) in one or two cities, and this process leads to a set of disadvantages in the dominant cities and the other cities, and this is represent an incorrect status in urban systems, particularly in developing countries. However, the deployment of concentration to be the predominant phenomena of the urban system through deployment of medium and large size cities can achieve sustainable growth and the emergence of the multiplier and this would enhance the development process.

Without doubt , the correct usage of sources of wealth, provide good environment for the economic rationality, so as to ensure the achievement of economic , social and political objectives..., this means maximizing the benefits to the highest possible degree and reducing costs to the minimum degree, or a combination of higher benefits and lower costs. The question arises, if we want to achieve economic rationality in our urban systems, what should we do? And how?

To achieve the economic rationality we need to make structural changes in the national economy and spatial changes in the geographic space to ensure rapid economic growth, this need focusing on certain cities within the urban system characterized with its medium or large-sized , to achieve economic efficiency , and what so-called the urban concentration, this concentration is not limited in a certain number of cities , but extends among the country as a whole to form what so-called concentration decentralization which results in urban hierarchy (Simmons, 1978).

The absence of national urban policy in Iraq for the last period yield to urban dominance , without hierarchy system , and the most obvious characteristic of its cities are the small sizes which cannot provide a good environment to promote economic development and social stability. While the economic environment requires the large sizes of cities in the urban system which can provide good environment for economic investment and enhances the development process(Mahmud, 2014).

Moreover, lack of infrastructure networks in urban areas and economic problems due to the failure of urban development policies, so ,decision makers and planners in Iraq have to correct this situation from unbalanced and over concentrated urban system to more balanced and dispersed urban system, especially our population is expected to increase to 40 million by 2020, with most of the growth taking place in cities (UN-HABITAT, 2009).They requires to develop urbanization strategy determined which cities must be developed in the long-term, and how these cities will be selected and which criteria may depend upon? Our paper devoted to explain the criteria of selecting cities of the urban system in Iraq.

1.1 Problem Statement

Dominance of the dual spatial development phenomenon, with the limited developed areas, especially in major cities and central province cities that take up the largest share of economic activity, services, and presence of extreme spatial concentration, particularly urban, in a very limited number of large cities. Besides absence of a comprehensive policy for urbanization, this complicate the current situation .while the future trend will be more complex due to the expected population which will be increased to 40 million by 2020, with most of the growth taking place in cities.

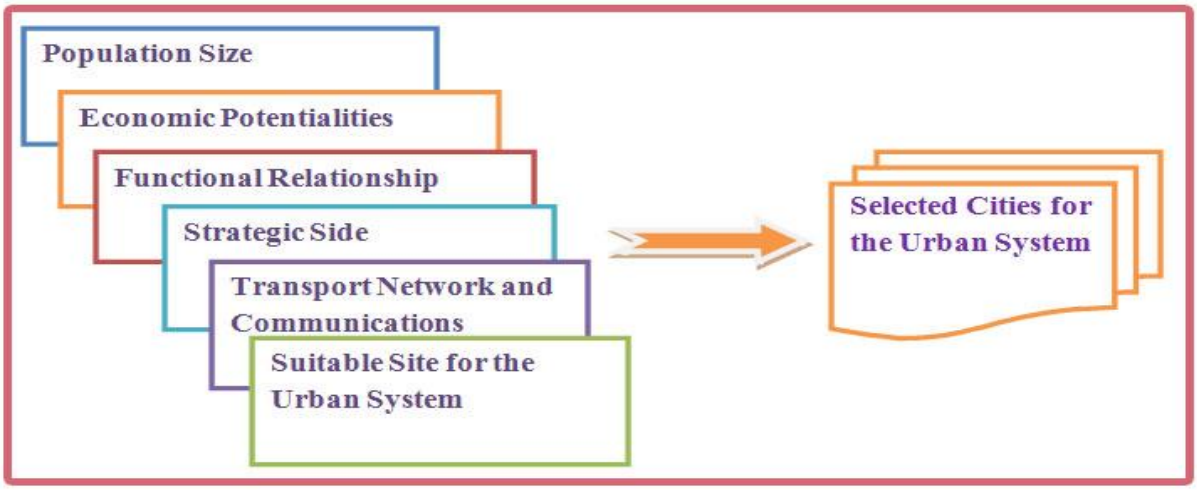
Hence, massive efforts are therefore urgently required to make cities productive, with adequate housing and infrastructure. This will require rational urban system, making best use of the available recourses, provide good environment for economic investment and enhances the development process.

1.2 Research Objective

The research objective represent with putting criteria to select the cities of the urban system which will solve the following problems:

1. Correct the situation of dual spatial development from unbalanced to more balanced.
2. Correct the situation of urban concentration in one or two primate cities, from over concentrated urban system to more dispersed urban system.
3. Achieved the so-called concentration decentralization which results in hierarchy in the urban system as a whole depending on a comprehensive policy for urbanization.

1.3 Conceptual Framework



1.4 Hypotheses of the study

The first Hypotheses: The presence of Successful national urban system would contribute to resolve duality in spatial development, the extreme concentration of populations, and the current economic situation.

The second Hypotheses: The absence of national urban system yields to urban dominance, more concentration in limited cities, failure of provide good environment for economic investment.

1.5 The importance of study

The importance of study comes from the importance of the urban system regulation to be more rational, and from the results that could be achieved from this system included good economic environment for investment with efficiency, enhance the development process, and increase opportunities for scientific development. In other word the presence of rapid economic development is the most important indicator of the existence of a rational urban system.

2. Background Theory of the Study

The city is the basic unit in the urban system ,and the interest in it has become increasingly in the current years for its major socio-economic role in the society. Cities never actually develop as isolated entities; they are always engaged in many types of interactions with other cities. They are linked through a variety of social networks, among which there are not only the visible infrastructures, as physically represented by roads, railways or airlines, or the usually accounted exchanges, as population migrations or trade of goods, but also more "invisible" networks, as capital investment and information flows (the latter being more especially involved in the process of innovation diffusion (Bretagnolle A., 2009).

It is important for national authorities to help and encourage cities to strengthen their attractiveness by upgrading the quality of the environment and by providing for the better utilization of the potential of local cultural and natural resources and identity. Urban areas of different sizes play important and different roles in regional development (Nordic and Regions, 2006).

In the age of globalization, the role of countries is almost replaced by cities. the task of developing the competitiveness of cities has become more important to take the city of the

future its vital role in the spheres of economic, cultural, scientific , technological and all important aspects (Wen- Fong Huang, 2010).

2.1 The Urban System Concept

The urban system represents the frame within which all urban centers are organized and interacted with each other regarding their sizes and functions. Any urban centers couldn't be studied away from the urban system located in it. Thus, urban and regional planners were interested in studying this relationship (Maksoud, 2003).

An urban system is defined as a set of nodes (urban centers) that are more closely linked to each other through the movement of goods, capitals, information and population, than to centers outside the system. Most urban system should be defined using political boundaries, particularly national boundaries, but this is not reasonable criteria since all nations' states have played fundamental role in the evolution of their respective urban systems (L.s.Bourne, 1975).

2.2 Objectives of urban system

The Objectives of urban system could be summarized in the following:

1. Providing public services and infrastructure for all governorates.
2. Reduction of the development gap between urban and rural areas.
3. Rationalizing use of natural resources in all governorates.
4. Eliminate the phenomenon of dominance of one city.
5. Decrease the extreme population concentrations in a few cities.
6. Put an end to the dominant city phenomenon in the country as a whole as well as within each governorate.
7. Reduce the differences between regions and between urban and rural areas.
8. Resolve the dual spatial development problem in the country as a whole, as well as within each governorate.
9. Reduce the great disparity in infrastructure and public services available among governorates and within each governorate.
10. Preserving agricultural land and using land in rational manner.
11. To strengthen the transport network, so as to establish means of linking cities, particularly small and medium-sized cities

12. Reduce poverty and slums in cities; and improve the economies and quality of life in rural areas (Iraq, 2010).

2.3The Role of Urban Systems in the Development Process

The urban systems have, through its cities, a significant share of the national wealth in the developed and developing countries, and the relationship between urbanization and development, despite being a complex relationship, but it is, from simple viewpoint, urbanization is a result of the development process (Simmons, 1978).

The development process is linked closely to the changes in the spatial organization. Friedmann explain the factors or forces that form the basis of change in the spatial organization included the following:

1. Expansion in energy, transportation and communication within the areas of large and spacious.
2. Increase the number of possible links between the constituent parts of the system.
3. Reduce the cost of transport unit.
4. Raising real per capita income.
5. Increase the speed in transport and communication system (Friedmann, 1975).

Friedman believes that the relationship between development process and the spatial organization, through a series of changes in the structure of spatial relationships, enhances the possibility of the community to achieve reasonable development depending upon his internal sources of wealth. Among these changes:

1. The transformation from the simple structure to the complex structure.
2. The transformation from the unbalanced structure to the balanced structure.
3. Transformation from partial regional integration to total regional integration (Friedmann, 1975).

The summary of the changes that serve the development process are:

1. Increasing deregulation in the economic decisions of the site
2. Increasing the geographical movement of the population and productive resources.
3. An extensive network and great social interaction.
4. A large number of decision-making centers.
5. Greater ease in communication between the centers (Friedmann, 1975).

In general, urban systems aimed at, through its cities, to achieve a set of goals through the development process, mainly:

1. Increasing national independence by strengthening the army and military capabilities. Raising the living standards of the population by increasing production rates and accelerating greater rates of population growth and redistribution of income. 3 - Increase social integration through the active participation of the entire population in the decision-making community.
2. Increasing urbanization and modernity through the development of institutional framework promotes activities and contributes to the generation of continuous change, especially in the field of science and art are helping to increase the contribution of scientific and cultural community
3. Increased integration of spatial development process through the deployment of all the national space through a balanced system of human settlements(Friedmann, 1975).

In addition, the cities of the urban system have important roles could increase the relative importance of the urban system and could elevate it from national system to a global system, from these roles: the political& administrative role , the cultural& social role ,the economic role as a center of production consumption , and services role, and the information role as well as the city strategic role (J.Smelser, 1969).

3. The Iraqi Urban System characteristics

The main characteristics of the Iraqi urban system could be summarized as follows:

3.1 Spatial duality

There is a clear duality in development in Iraq. Indeed, there are major developed and underdeveloped centers in the cities and regions. These are characterized by their relative advantage in terms of development and external resources and are more successful in attracting investments in its various forms, public and private, than other centers.

Development and growth can be noted in those cities due to the rise in sectoral growth rates for various sectors of economic activities, like building industrial facilities, population growth rates, per capita national income, or level of urbanization, as well as the scarcity of economic resources (Iraq, 2010).

Table 1: The percentages of industrial labor force for some governorates

City	year	1960	1969	1976	1981	1987	1992

Baghdad	60.3	65.17	52.7	49.68	53.3	39.1
Basra	6.4	9.4	8.7	8.99	5.4	9.8
Nineveh	9.6	7.6	7.4	7.01	8.7	6.2
Sum	76.3	82.17	68.8	65.68	67.4	55.1

Source: (Iraq 1992), (Mahmud, 1998)

Table 2: The percentages of industrial companies (large and small) by governorates

City / **Year**	**1960**	**1969**	**1976**	**1981**	**1987**
Baghdad	52.4	62.4	56.8	55.24	49.6
Basra	18.6	10.8	10.4	7.28	2.9
Nineveh	8.0	5.0	7.3	7.01	8.0
Sum	79.0	78.2	74.5	69.53	60.5

Source: (Iraq 1988), (Mahmud, 1998).

3.2 Spatial Concentration

Since 1950, and continuing on to 1995, most plans referred to a clear focus on the levels of economic and social development in a limited number of governorates. This generated a growing movement in mass migration toward these centers in a way that largely contributed to the spatial disparity between the developed and underdeveloped governorates in all aspects of economic, social, and urban development. These influences were reflected in the method of the population's spatial distribution: heavily populated centers were the same centers that enjoyed economic growth, so they continued to attract growth away from other areas. As a result, there was a correlation between the level of urbanization and economic development. Table (3), shows the relative distribution of population concentrations and investments in Baghdad governorate for the period of 1965-2007 as compared to Iraq as a whole (Iraq, 2010).

Table 3: Distribution of Population Concentrations and Investments in Baghdad for the Period 1965–2007 as a Percentage of Totals

Concentration percent	**1965**	**1977**	**1987**	**1997**	**2007**
Population concentration in Baghdad as a percent of total in Iraq	25.4	26.6	23.5	24.5	24.1
Investment in Baghdad as a percent of total in Iraq	30.7	20.7	37.5	37.6	16.4

Source: (Iraq, 2010).

3.3 Urban Hierarchy

The current situation of concentration of population and economic activities in Iraq shows that Baghdad is a dominant city. The total population of the second largest city after Baghdad was one-sixth of Baghdad's. This contrasted with the fifty percent rule set by the infamous Zaif principle.

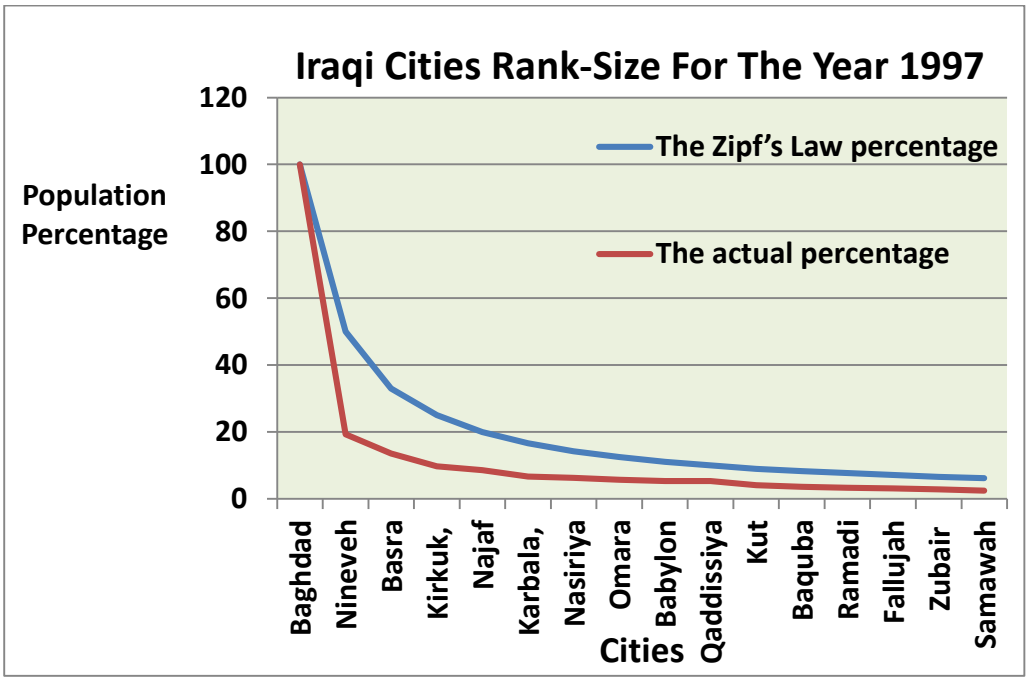


Fig 1: Iraqi Cities Rank-Size for the Year 1997

Source:(Mahmud, 2014)

4. The urban system Challenges

The urban system Challenge could be summarized in the following:

1. Dominance of the dual spatial development phenomenon, with the limited developed areas, especially in major cities and central province cities that take up the largest share of economic activity, services, and infrastructure as compared to the underdeveloped regions, particularly in the rural districts and counties

2. Presence of extreme spatial concentration, particularly urban, in a very limited number of large cities. Baghdad, Mosul and Basra account for 55 percent of the urban population

3. Absence of a comprehensive policy for urbanization small rural towns' productive human resources, and the pressure that puts on already scarce housing and public services in the cities attracting new populations (Iraq, 2010).

5. The urban system Vision

The spatial and economic vision of the urban system in Iraq represent with focusing on the strengthening of comprehensive and continuous spatial development in all provinces, the provision of public services and infrastructure for all citizens, the reduction of the development gap between urban and rural areas, the rational use of natural resources in the provinces, and the achievement of equality in the spatial development, all of these measures would contribute to the solution of the complex problems in Iraq which represent with duality of spatial development, concentration of the population, and the current economic situation (Iraq, 2010).

6. Benefits of Selection National Urban System's Cities

Due to The application of some criteria, group of cities could be chosen or selection to represent the urban system in Iraq - the first hierarchical level. Economic resources could be directed to these cities to achieve the development of the national urban system. This process could have many benefits including:

1. Investment sources of wealth in the country in a rational manner.
2. To get better Distribution of investments.
3. Distribution of the population so as to ensure strengthening of economic capabilities in many cities through the elimination of the so-called Population Threshold.

4. Strengthening the role of the private sector in these cities after it was confined to the dominant cities.
5. Strengthening the scientific aspects and informatics and innovative role in these cities.
6. To promote economic development in these cities in general.
   This might have the results of social, political, strategy including:
   a. To reduce the relative disparity between cities and to achieve as much of important spatial and social justice.
   b. To reduce the percentage of migration and achieve population stabilization
   c. To promote strategic and security aspects (Mahmud, 1998).

7. Procedures of Selection of the urban system's cities

In order to select a city from each governorate, the following procedures require to be adopted:

7.1 Identifying the Indicators

There are number of indicators and variables have to be available in the City to be one of the National Urban System cities, the most important indicators are:

1. Population size.
2. Economic potentialities.
3. Functional relationships with other cities.
4. Suitable site for the urban system.
5. The strategic side.
6. Transport network and communications.

7.2 Putting the Weights for the Indicators

The relative importance of each indicator varies from city to another due to the urban system goals. And when the goal of the urban system is to achieve the urban economic rationality, greater weight must given to the economic indicators , so the relative importance of the evaluation indicators will be as the following:

The highest weight will be given to the economic variables (population 5 points , economic potential 5 points , functional relationship 5 points), followed by the suitable location 4 points , and the Transport and Communications 3 points , and finally the strategic side factor 2 points.

7.3 Evaluation of the Selected Indicators in Each City

The process of giving value to every indicator depending upon its existing in every city vary from Scholar or Reviewer to another , some of them gives (+1) when the evaluated indicator will be achieved in a complete situation and (zero) when the evaluated indicator will be achieved partially , and (- 1) in the case of its negative presence, another gives (3) points , (2) points, and one point consequently.

In order to give a clearer picture of the differences by the total points for each city , we will give the indicators that subject to evaluation the following values : (5) points in the case of well achieved , and (3) points in the case of partial achieved , and one point in the case of non- achieved. Based on the above, the given values for the evaluated indicators will be as following:

7.3.1 Population Size

The demographic requirement is represented by the opportunities of a minimum population threshold, below which it would not be possible to ensure an economic performance (economy of scale) of urban services, that is effectively competitive (in efficiency and quality) with that of the "big cities"; and that degree of integration which excludes "external" commuting to the system.

Population size means that the city have a better chance in the development process , it provides good labor force, bigger market and more services, These capabilities can enhance the development process . In the light of this fact the relative importance of this factor will be the highest, so the chosen of a city with large population size is the first step in the right direction. In other word the population size is a function of rational urban systems, hence this factor will be given higher value or points as following:

Table 4: The given values for population size

population	**value**
More than 100000	5 points
50000-99999	4 points
25000-49999	2 points
Less than 25000	1 point

7.3.2 Economic Potentialities

The relative importance of the economic potentialities equals the relative importance of the population size ,due to the importance of it as a ground of the growth and development,, and the lack of such capabilities in a city can be an obstacle in the growth and development in the future , so this factor must given value or points in the light the location Quotient of the industrial and agricultural labor force of the city as the following:

Table 5: The given values for the industrial and agricultural labor force

Location Quotient	**value**
More than 1	5 points
0.50- 1	3 points
Less than 0.50	2 points

7.3.3 Functional Relationship

Functional relationship has good relative importance due to the role of this factor in the urban system development process. The city which owns good functional relations with other cities can grow and develop greater and faster than those that have not such relationships. The functional relationship is a function of the presence of Socio- economic potentialities, and the existence of good relationships means the existence of economic base.

This factor has an economic importance for the growth of cities and their development, as well as the degree of the development of the urban systems could be measured through the functional relationship, and the absence of a functional relationship between groups of cities does not make them a system, but urban settlements network only. The given value of this indicator will be as the following:

Table 6: The given values for the population movement

The internal movement	**value**
more than 30 % of the total	4 points
(15 % - 30 %	3 points
(5% - 14%)	2 points
Less than 5%	1 point

7.3.4 Appropriate Location (Site)

The following question should be answered here: What is the best distance interval between the urban system cities? What is the best distance for the chosen city from the nearest large city?

The best distance is (70-100) km .If the Distance is more than 100 km between the city and another , we will get a small number of urban centers within these distances , and if we adopted less than 70 km close major urban centers can appear such as Mosul and Baghdad , Basra and Kirkuk .... , From here, the acceptable distance between centers of the governorates will be 70-100 km, with some exceptions. The given values will be as the following:

Table 7: The given values for the appropriate Location

Distance from large city	**value**
70-100 km	4 points
More than 100 km	2 points
Less than 70 km	2 points

7.3.5 Transportation and Communications

Transportation represents the fifth indicators, and the given values will be as the following:

Table 8: The given values for the transportation and communications

Transportation type	**value**
Air port	4 points
Main road	2 points
Rail road	2 points
Secondary road	1 point

7.3.6 The Strategic Side

The relative importance of this indicator is less than others indicators (3 points), due to the aim of the system which is the economic rationality rather than security, despite the overlap of these goals. This index includes three elements, the distance from each city to other,

distance from border, and fills the gap of the urban system. The given values will be as the following:

Table 9: The value of Strategic indicator

The Strategic side	**value**
10-15 km distant from the border	3 points
15-30 km from the border	2 points
More than 30 km from the border	1 point
prevent concentration	2 points

7.4 Application of the Criteria on Salah al-Din Governorate Cities

7.4.1 **Population size**

Depending on the proposed values of the population size, Salah al-Din cities points will be as the following:

Table 10: the population criteria points for salah al-Din cities

City	**population**	**value**
Tikrit	101184	5 points
Samarra	147665	5 points
Balad	54339	4 points
Tuze	88391	4 points
Baiji	59575	4 points
Al-Dour	18187	1 point
Sharqat	40436	2 points
Dijial	28885	2 points

Source:(Planning, 2012)

7.4.2 .**Economic Potential**ities

Depending on the proposed values of the Economic Potentialities, Salah al-Din cities points will be the medium value of the Agricultural labor force location quotient and the industrial labor force location quotient.

Table 11: The Economic Potentialities (Agricultural labor force**)** points for salah al-Din governorate cities

City	**Agricultural labor force**	**Total labor force**	**location quotient**	**value**
Tikrit	7064	25990	1.12	5 points
Tuze	1067	25747	0.17	1 point
Samarra	11368	24636	1.91	5 points
Balad	5620	28455	0.81	2 points
Dujial	4670	9259	2.08	5 points
Baiji	2037	12746	0.66	3 points
Al-Dour	1787	4659	1.58	5 points
Sharqat	1770	15044	0.48	1 point
sum	35383	146536		

Source:(Mahmud, 1998)

Table 12: Economic Potentialities (industrial labor force) points in Salah al-Din governorate cities

City	**Industrial labor force**	**Total labor force**	**location quotient**	**value**
Tikrit	374	25990	0.31	1 point
Tuze	1005	25747	0.85	2 points
Samarra	2547	24636	2.27	5 points
Balad	811	28455	0.62	2 points
Dujial	1142	9259	2.71	5 points
Baiji	337	12746	0.58	2 points
Al-Dour	184	4659	0.86	2 points
Sharqat	264	15044	0.38	1 point
Sum	6664	146536		

Source:(Mahmud, 1998)

7.4. 3. Functional Relationships

The rate of movement that entering to any city could give an indicator of the importance of the city as compared with other cities and explain the extent of independence or

dependency of this or that city. The researcher conducted a field survey of the transport traffic and the purpose of the trip in the cities of Salah al –Din province, to see the inner and outer traffic and the purpose of the journey, the results of the total movement were as shown in the table below.

Table 13: The total movement in Salah al-Din governorate

City	**Total movement**	**%**	**Internal movement**	**%**	**Internal movement / Total movement**
Tikrit	7420	24.7	4678	46.6	63.00%
Samarra	4620	15.4	750	7.5	16.2%
Baiji	5540	18.4	1976	19.7	35.6%
Balad	5410	18.00	1948	19.4	36.00%
Tuze	2780	9.3	34	0.3	1.2%
Al-Dour	1500	4.9	630	6.3	42.00%
Sharqat	500	1.7	24	0.2	4.8%
Dujial	2290	7.6	-	-	-
	30060	100%	10040	100%	

Source: Field survey results carried out by the researcher

Depending on the proposed values of the population movement between cities, Salah al-Din cities points are as the following:

Table 14: Functional Relationships points for Salah al-Din governorate cities

City	**Total daily movement**	**The internal movement**	**Internal movement/total movement**	**value**
Tikrit	7420	4678	63.00%	4 points
Samarra	4620	750	16.2%	3 points
Baiji	5540	1976	35.6%	4 points
Balad	5410	1948	36.00%	4 points
Tuze	2780	34	1.2%	1 point
Al-Dour	1500	630	42.00%	4 points
Sharqat	500	24	4.8%	1 point
Dujial	2290	-	----	1 point

Sum	30060	10040		

7.4.4 Communications and Transport

Depending on the proposed values of the Communications and Transport, salah al-Din cities points will be as the following:

Table 15: Communications and Transportation points for Salah al-Din governorate cities

City	**Transportation type**	**value**
Tikrit	Air port, Main road, Rail road,	8 points
Samarra	Main road, Rail road,	4 points
Balad	Main road, Rail road,	4points
Tuze	Main road,	2 points
Baiji	Main road, 2 Rail road,	6 points
Al-Dour	Secondary road	1 point
Sharqat	Main road,	2 points
Dujial	Main road, Rail road,	points

7.4.5 Suitable location

Depending on the proposed values of the location criteria Salah al-Din cities points will be as the following:

Table 16: Suitable location points for Salah al-Din governorate cities

City	**Distance from large city**	**value**
Tikrit	More than 100 km	2points
Samarra	More than 100 km	2points
Balad	70-100 km	4points
Tuze	More than 100 km	2 points
Baiji	More than 100 km	2 points
Al-Dour	More than 100 km	2 point
Sharqat	70-100 km	4 points
Dujial	70-100 km	4 points

7.4.6 Strategic side

Due to the long distance of Salah al-Din governorate from the border of the country, so the proposed values of the strategic aspect criteria will be equity as the following:

Table 17: The Strategic side points for Salah al-Din governorate cities

City	Distance from the border	value
Tikrit		1 points
Samarra		1 points
Balad		1 points
Tuze		1 points
Baiji		1 points
Al-Dour		1 point
Sharqat		1 points
Dujial		1 points

7.5 Selection of the Best City

After the process of putting weights that represent the relative importance of the basic indicators and the degree of its existence in each city , the next step will be the determine of the best cities through Weighting process by multiplying Points of each indicator by its weight and collection points of all indicators in every city to show the potential development in the governorate's cities , represented by the total number resulting from the operations of the weighting , and it becomes possible to choose the best city during the developmental potential matrix .The city that gets the highest total of points will be the best city as shown in the following table.

Table 18: Developmental Potential Matrix of Salah al-Din governorate cities

Center	Population size The weight 5		Economic potentialities The weight5		Functional relationship The weight 5		Appropriate Location The weight 4		Communications and Transport The weight 3		Strategic indicator The weight 2		sum
	value	points	value	points	value	points	value	points	value	points	value	Points	
Tikrit	5	25	3	15	4	20	2	8	8	24	1	2	94
Samarra	5	25	5	25	3	15	2	8	4	12	1	2	87
Balad	4	20	2	10	4	20	4	16	4	12	1	2	80
Tuze	4	20	2	10	4	20	4	16	2	8	1	2	76
Baiji	4	20	3	15	1	5	2	8	6	18	1	2	68
Al-Dour	1	5	4	20	4	20	2	8	1	3	1	2	58
Sharqat	2	10	1	5	1	5	4	16	2	6	1	2	44
Dujial	2	10	5	25	1	5	4	16	4	12	1	2	70

The results of the weighting matrix appear that the city of Tikrit, is the first with total points (94 points), followed by the city of Samarra with total points (87 points) and then the city of Balad with total points (80 points).

In order to enhance the confidence of the results that have been reached sensitivity analyzes will be conducted.

8. Sensitivity Analysis

The process of giving weights to the evaluation indicators is one of the most important factors within the development potential analysis model; hence one of the main disadvantages is the possibility of the existence of a high degree of personal judgments of the analyst or the Evaluation Committee when put weights that reflect the relative importance of these indicators.

To overcome the problem of weights, this method needs to make sensitivity analysis by changing the weights given to the evaluation criteria to avoid this situation and strengthen the confidence of the findings. This process means changing the weights of indicators to avoid the personal judgments. The process will be as the following:

a. Uniform weights are given for all indicators.

b. The higher indicators weights are given to the low indicators weights, the top weights will be the low weights, and the low weights will be the top weights.

c. The higher weights are given to the middle weights, and the minimum weights are given to the highest and lowest weights, as shown in the following tables.

Table 19: Developmental Potential Matrix of Salah al-Din governorate cities, Sensitivity Analysis given uniform weights

Center	Population size The weight 5		Economic potentialities The weight 5		Functional relationship The weight 5		Appropriate Location The weight 5		Communications and Transport The weight 5		Strategic indicator The weight 5		sum
	value	points	value	points	value	points	value	points	value	points	value	Points	
Tikrit	5	25	3	15	5	25	2	10	8	40	1	5	120
Samarra	5	25	5	25	5	25	2	10	4	20	1	5	110
Balad	4	20	2	10	4	20	4	20	4	20	1	5	95
Tuze	4	20	2	10	4	20	4	20	2	10	1	5	85
Baiji	4	20	3	15	1	5	2	10	6	30	1	5	85
Al-Dour	1	5	4	20	4	20	2	10	1	5	1	5	65
Sharqat	2	10	1	5	1	5	4	20	2	10	1	5	55
Dujial	2	10	5	25	1	5	4	20	4	20	1	5	85

Table 20: Developmental Potential Matrix of Salah al-Din governorate cities, Sensitivity Analysis given reversed weights

Center	Population size The weight 2		Economic potentialities The weigh2		Functional relationship The weight 2		Appropriate Location The weight 5		Communications and Transport The weight 5		Strategic indicator The weight 5		sum
	value	points	value	points	value	points	value	points	value	points	value	Points	
Tikrit	5	10	3	6	4	8	2	10	8	40	1	5	79
Samarra	5	10	5	10	3	6	2	10	4	20	1	5	61
Balad	4	8	2	4	4	8	4	20	4	20	1	5	65
Tuze	4	8	2	4	4	8	4	20	2	10	1	5	55
Baiji	4	8	3	6	1	2	2	10	6	30	1	5	61
Al-Dour	1	2	4	8	4	8	2	10	1	5	1	5	38
Sharqat	2	4	1	2	1	2	4	20	2	10	1	5	43
Dijial	2	4	5	10	1	2	4	20	4	20	1	5	61

Table 21: Developmental Potential Matrix of Salah al-Din governorate cities, Sensitivity Analysis given higher weights to the middle weights

Center	Population size The weight 2		Economic potentialities The weight 2		Functional relationship The weight 2		Appropriate Location The weight 5		Communications and Transport The weight 5		Strategic indicator The weight 2		sum
	value	points	value	points	value	points	value	points	value	points	value	Points	
Tikrit	5	10	3	6	4	8	2	10	8	40	1	2	76
Samarra	5	10	5	10	3	6	2	10	4	20	1	2	58
Balad	4	8	2	4	4	8	4	20	4	20	1	2	62
Tuze	4	8	2	4	4	8	4	20	2	10	1	2	52
Baiji	4	8	3	6	1	2	2	10	6	30	1	2	58
Al-Dour	1	2	4	8	4	8	2	10	1	5	1	2	35
Sharqat	2	4	1	2	1	2	4	20	2	10	1	2	40
Dujial	2	4	5	10	1	2	4	20	4	20	1	2	58

Table 22: Summary of the Evaluation Process and Sensitivity Analysis of Salah al-Din Governorate Cities

The city	**Evaluation results**	**Sensitivity analysis results**			**Average values of sensitivity analysis**
		a	**b**	**c**	
Tikrit	**94**	**120**	**79**	**76**	**91.66**
Samarra	**87**	**110**	**61**	**58**	**76.33**
Balad	**80**	**95**	**65**	**62**	**74**
Tuze	76	85	55	52	64
Baiji	85	85	61	58	68
Al-Dour	58	65	38	35	46
Sharqat	44	55	43	40	46
Dujial	70	85	61	58	68

The results of sensitivity analysis clarify that the cities of Tikrit ,Samarra, and Balad is the best three cities in Salah al-Din governorate, So these cities will represent the poles of the

national urban system in Iraq, while the others in ranking will be the regional centers in the governorate.

9. Conclusion and Recommendations

9.1 Conclusion

To achieve economic rationality in his urban system, Iraq requires selecting a group of cities to be developed, and this process requires using of number of indicators in order to choose the best one. The general standards that could be derived from the case study represented with population size ,economic potentialities, specially industrial and agricultural labor force and the functional relationship (economic basis), which is measured by internal movement to the city (not less than 30% of the total traffic entering to the governorate).

The application of the above criteria can determine the cities of the national urban system, which will bring economic rationality to the development process, as well as achieving social objectives - of justice in the distribution of services, and political goals - of the stability of the urban centers, and strategic goals of the distribution of the population, investments and, the objectives of spatial - of relative treatment to the disruption of structural urban environment.

9.2 Recommendations

Some recommendations are necessary to achieve the objectives of the study; these recommendations can be summarized as follows:

1. Using the criteria of population size, economic potentialities, functional relationship, suitable location, and strategic side in choosing the cities of the urban system in other governorates.
2. Putting priorities for the development of cities at the national urban system, and other urban system levels.
3. Further studies must be focused on the economic aspects of the sizes of cities, the sizes of economic efficiency, which can bring economic rationality.
4. There is great need to identify the three urban systems, the national, regional and local system.

5. A long-term strategy of urbanization must be developed in Iraq based on identifying, clearly, the trends of urban growth during the future period, and we strongly recommend adopting the strategy of "concentration decentralization".

6. Developing national urban policy, which can achieve the objectives of the urbanization strategy.

7. More coordination between urban policy and other policies is deeply needed to link the sectoral and spatial investments.

8. More authorities have to be given to the governorates management to Strengthening the decentralized management system in it, and to be able to plan and implement their development plans.

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