Urbanization and nomadism, a study in the geography of cities / Anbar province as a model

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ملخص

في هذه الدراسة، تم اعتماد قاعدة حجم الرتبة، ومؤشر ميهتا، ومؤشر الأولوية أو مؤشر المدن الأربع، ونسبة الأولوية. ويهدف استخدام هذه الأدوات والمؤشرات إلى فهم التوزيع الحضري والهيمنة الحضرية في محافظة الأنبار بشكل أفضل وتقييمه بشكل أكثر شمولاً. بهدف تحليل السيطرة الحضرية في شبكة النظام الحضري في محافظة الانبار. تعد السيطرة الحضرية أحد التحديات الرئيسية التي تواجهها معظم النظم الحضرية في البلدان النامية. وقد تم اختيار حجم السكان كمؤشر لقياس السيطرة، على الرغم من الجدل الدائر حوله، لأنه يغفل جوانب أخرى مهمة من القياس، مثل الجوانب الاقتصادية والاجتماعية والسياسية وغيرها. قد تلعب المفردات المتعلقة بالهيمنة وتركز السكان في مدينة ما دورًا في تشكيل الهيمنة، إلا أن معظم الدراسات حول هذا الموضوع تعتمد على مؤشر الحجم فقط. وتوصل الباحث إلى عدة استنتاجات منها أهمية فهم الهيمنة الحضرية في تصميم السياسات الحضرية والتنمية المستدامة. كما تم اقتراح توصيتين: تعزيز الوعي بأهمية التحضر والبدوية في المدن وتطوير السياسات الحضرية التي تعزز التنمية المستدامة في محافظة الأنبار.

الكلمات المفتاحية: التحضر، البداوة، جغرافية المدن.

Abstract

In this study, the rank-size rule, the Mehta Index, the Primacy Index or Four Cities Index, and the Primacy Ratio were adopted. The use of these tools and indicators aims to better understand the urban distribution and dominance in Anbar Governorate and evaluate it more comprehensively. With the aim of analyzing urban control in the urban system network in Anbar Governorate. Urban control is one of the main challenges that most urban systems in developing countries face. Population size was chosen as an indicator to measure control, despite

the debates surrounding it, since it overlooks other important aspects of measurement, such as economic, social, political and other aspects. Vocabulary related to dominance and the concentration of population in a city may play a role in shaping dominance, however, most studies on this topic are based on the indicator of size only. The researcher reached several conclusions, including the importance of understanding urban domination in designing urban policies and sustainable development. Two recommendations were also proposed: enhancing awareness of the importance of urbanization and Bedouinism in cities and developing urban policies that promote sustainable development in Anbar Governorate.

Keywords: urbanization, nomadism, geography of cities.

1- Introduction

Urban geography is an important field in understanding the development of cities and their effects on social, economic and cultural life. Among the regions that deserve geographical attention is the province of Anbar, which is famous for its geographical diversity and ancient history. Anbar Province is characterized by its geographical diversity and diverse terrain, as it extends from the vast desert to rivers and fertile plains. The province has a rich history and unique culture, which makes it an attractive subject to study the geography of cities. This research is based on available secondary sources and previous studies in the field of urban geography and urban development in Anbar Governorate. Geographical and analytical methods will also be used to analyze city data and the geographical distribution of population, resources and urban infrastructure. The available statistical and geographical data, such as the population census and geographical maps, will be reviewed to understand the distribution and development of cities in the governorate using analytical methods. The relationships and correlations between the

various variables affecting the geography of cities, such as economic, social and political factors, will be studied. Spatial analysis techniques will be applied to analyze the geographical distribution of cities and resources, and to identify existing patterns and potential future changes in urban settlements. The study will also rely on field research and primary data collection through surveys and interviews with experts and local residents. This data will be used to verify the results and to clarify the special factors affecting the geography of cities in Anbar Governorate.

This study will contribute to providing deep insights about the development of cities in Anbar Governorate and its economic, social and environmental impacts. The results will contribute to directing policies and making appropriate decisions to improve urban planning and infrastructure development in the governorate. The study will provide concrete recommendations for the concerned authorities to improve urban management, direct urban investments, and promote sustainable development in Anbar Governorate. The study will also provide a framework for future research in the field of urban geography.

1-1- Research Importance: The research focuses on the importance of understanding the geography of cities and their impacts in Anbar Governorate. The main importance of the research is attributed to the following: Understanding urban transformations: The research helps in understanding the development of cities in Anbar Governorate and the transformations they are witnessing at the geographical level. This understanding enhances our understanding of the development of infrastructure and the understanding of population growth and its effects on the economy, society and the environment.

- Sustainable urban planning: The research contributes to directing policies and taking appropriate decisions to improve urban planning in

Anbar Governorate. By understanding the geography of cities and their shaping factors, investments and infrastructure development can be directed in a way that enhances environmental, economic and social sustainability.

- Promoting local development: The research contributes to promoting local development in Anbar Governorate by identifying the opportunities and challenges facing cities in the region. Findings and recommendations can lead to strengthening local capacities, improving employment opportunities and providing basic services to the population.

- Preserving cultural identity: The research enhances our understanding of the balance between urbanization and Bedouinism in Anbar Province and its impact on the local cultural identity. The results can contribute to the preservation of the ancient and cultural heritage of the region in the face of challenges related to urban development.

1-2- Research problem: The research problem is represented in the tension and contradictions between urbanization and nomadism in the geography of cities in Anbar Governorate. This issue is of critical importance in view of the challenges faced by cities in the governorate in order to achieve sustainable urban development and improve the quality of life of the population. Despite the urban growth and economic development in Anbar Governorate, it faces challenges related to the unbalanced distribution of basic resources and services, and the exacerbation of economic and social gaps between major cities and rural areas. This tension between urbanization and nomadism can lead to deterioration of living conditions and unsustainability of urban development. In addition, cities in Anbar Province face environmental challenges, such as water and air pollution and the effects of climate change, which requires directing

efforts towards sustainable development and preserving the natural environment.

Thus, the research problem revolves around understanding the tensions between urbanization and Bedouinism and the challenges of sustainable urban development in Anbar Governorate, and how to deal with this problem through urban planning, resource development and the promotion of balance between the economic, social and environmental needs of cities.

1-3- Research objective: This study aims to explore and analyze the factors affecting the development of cities in Anbar Governorate, with a focus on the contradictions between urbanization and nomadism. The study also aims to understand the impact of geographical, economic, social and cultural factors on the formation of urban infrastructure and the distribution of resources in cities. The study is a model for understanding the challenges and opportunities facing cities in the governorate, and how they deal with the tensions between urbanization and nomadism. By analyzing the various factors that affect the geography of cities, effective strategies can be developed to achieve the optimal balance between urban development and the preservation of the cultural and environmental identity of the governorate.

1-4- Research Methodology: This research is based on a comprehensive and integrated methodology for analyzing urbanization and nomadism in the geography of cities in Anbar Governorate. A set of steps and tools are adopted to achieve the research objectives and to understand the existing tensions and challenges. Here is a summary of the research methodology: (1) Literature Review: Literature related to urbanization, nomadism, urban development and related concepts in the context of Anbar Governorate is studied and reviewed. Studies, previous research, and theories related to the topic are reviewed to

identify knowledge gaps and the framework for current research. (2) Data collection: The necessary data is collected to analyze urbanization and nomadism in cities in Anbar Governorate. This includes collecting quantitative and qualitative data from various sources, such as official statistics, government reports, field surveys, and personal interviews. (3) Data analysis: The collected data is analyzed using appropriate analytical tools. Statistical analysis, mathematical modeling techniques, content analysis, and other appropriate methods can be used to understand the relationships and trends between different variables.

2- The study area is Anbar Province

2-1- spatial boundaries

It is represented in the Anbar Governorate, which is located in the central western part of Iraq within the lands of the western plateau; It is bordered by Nineveh Governorate and parts of Salah al-Din Governorate from the north, Baghdad Governorate from the east, and the Najaf, Karbala and Babel governorates from the southeast. All of these are administrative borders within the administrative divisions of Iraq, as the Anbar Governorate has international borders as shown in Map No. (1); it is bordered by Syria from the northwest, Jordan from the west, and the Kingdom of Saudi Arabia from the south. As for its astronomical location, it is confined between two latitudes 31.5⁰ - 35⁰ north, and longitude 39⁰ - 44⁰ east.

As for the area of the province, Al-Anbar province is considered one of the largest provinces in Iraq in terms of area. Its area is (138,288 km ^{2}), which is equivalent to 31.8% of the total area of Iraq, which is (435,242 km^2); The number of urban centers reached (22) urban centers distributed over eight main districts; Each district has a main city and (14) sub-district centers distributed among the governorate's

districts, with the exception of Anah and Rawa, in which there is only the district center, as shown in Table No. (1) and Map No. (1).

Table (1): The spatial distribution of the districts of Anbar Governorate for the year 2020

N	eliminate	Area / km2	percentage	N	eliminate	Area / km2	percentage
1	Ramadi district center	7829		١٢	Center for justice	٥٥٤٩	٤,٠٤%
2	Habbaniyah district	714		١٣	Hadise	١٦٨٩	
3	fulfillment hand	-		١٤	Haqlaniyah district	-	
the total		٨٥٤٣	٦,١٨%	١٥	Barwana district	١٩٥٥	
٤	Hit district center	٥٤٤٥		the total		٣٦٤٤	٢,٦٤%
٥	Al-Baghdadi district	٤٨٠		١٦	Rutba district center	٣٥٠٣٥	
٦	leap hand	٢٤٢٨		١٧	Al-Waleed district	١٠٣٢٥	
٧	Euphrates district	-		١٨	Al-Nukhaib district	٤٨٠٨٥	
the total		٨٣٥٣	٦,٠٤%	the total		٩٣٤٤٥	٦٧,٥٧%
٨	Fallujah district center	٤٧٨		١٩	Al-Qaim district center	٦٤٦٠	
٩	Al-Amriya district	٢٥٣٢		٢٠	crossing hand	-	
١٠	Saqlawiyah district	١٥٧		٢١	Al-Obeidi district	٢٣٦٥	
١١	Karma district	١٠٣٨		the total		٨٨٢٥	٦.٣٨%
the total		٤٢٠٥	٣,٠٤%	٢٢	Rawa	٥٦٧٦	٤,١١%

				district center		
		Governorate			١٣٨٢٨٨	%١٠٠

Source: From the researcher's work, based on the statistics and estimates of the Ministry of Planning for the year 2020

Map (1)

Location of Anbar province in relation to Iraq
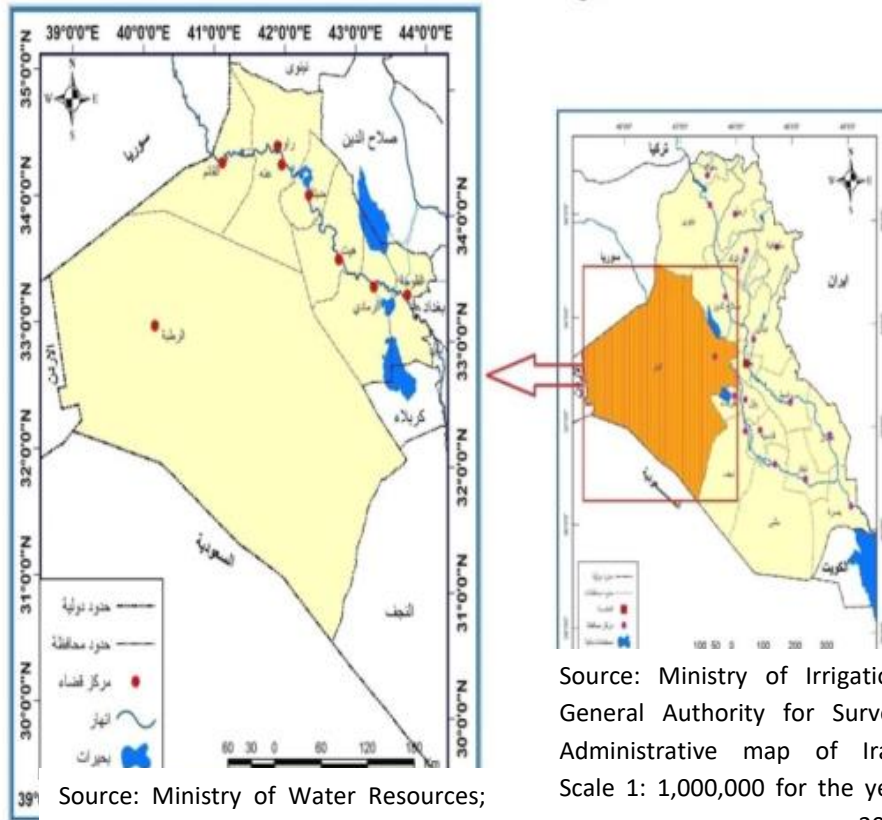
Source: Ministry of Water Resources; the general environment of the space; map production unit; digital unit; Anbar Province Topographic Map; scale 1: 500,000; for the year 2007.

Source: Ministry of Irrigation, General Authority for Survey. Administrative map of Iraq. Scale 1: 1,000,000 for the year 2000

2-2- Size arrangement of cities in the governorate, according to the rule (rank / size)

The great interest in studying the sizes of cities within urban studies is of great importance to know the extent of dominance that a city may

impose in a region or country. As a result, there is no balance in the development programs in this region or country, which will lead to the presence of a developed city or urban center against a periphery lagging periphery, and this in turn will lead to the main city dominating financial, human and intellectual resources. Which will cause or perpetuate the structural deterioration and disparities between the rest of the other urban centers scattered on the page of the region or the country.

Through this study, we can measure the size arrangement of the cities of Anbar Province; analysis of the distribution pattern and its implications for the structure of the existing urban system; revealing the extent of dominance that a city might impose on the rest of the cities of the governorate; Because the study of the volumetric structure of cities has important organizational connotations in studies of urban systems at the level of the state or region and highlights one of the important characteristics in the spatial structure of the urban system.

The rank-volume rule developed by George Zipf (1949) is one of the theoretical concepts that studies the relationship of city size to its rank; This is to know the system in which cities are arranged according to their sizes. It states that the population of the second city will be half of the population of the first city, the third city will be one-third of the population of the first city, the fourth city will be one-fourth of the population of the first city, and so on. Therefore, if we arrange the cities in descending order according to their sizes, the theoretical values of their population will be according to the following sequence:

$$\left(1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{n}\right)$$

That is, if we want to know the size of any city according to the rule, we divide the population of the first city by the rank of the city whose size we want to know, and the size sequence of cities.

In order to create a hierarchical system for the cities of Anbar Governorate according to the rank-size rule, three time periods 1987-1997-2020 were adopted, and tables were created that represent the size arrangement of the cities of the province according to the rank-size rule. Two forms were designed for each stage, a natural number form, and a logarithmic one that reveals patterns of distribution of city sizes according to their ranks, and then compares them with the ideal pattern assumed by the rule. In order to determine precisely the extent of the volumetric changes that occurred in the cities of Anbar Governorate, each stage can be clarified separately, as follows:

2-3- Volumetric arrangement of the cities of Anbar Province in 1987

During this passage the number of cities increased to twenty; That is: an increase of two cities over what was in the previous period; Where the city of Al-Amriya and Al-Rahaliya were added as districts in the district of Fallujah to the elements of the existing urban system. The city of Al-Walid was abolished and the city of Al-Nukhaib was annexed to the district of Al-Rutba. For comparison between what came in the rule of rank - size and the reality of the state of the governorate, it can be seen through Figure No. (1) and Table No. (2) related to this period. It is clear that the size distribution tends to the rule of Rank and size The actual logarithmic distribution if we exclude the second city, which is the city of Fallujah, will be similar to a large extent the size distribution of the cities of the province, and the difference between the theoretical and actual distribution is not very large, especially the cities that occupy advanced ranks within the size sequence up to the fourteenth rank.

The second city is also the city of Fallujah, which has become closer in terms of size to the first city. It became 88% of the size of the first city during this period.

To cancel the characteristic of the dominance of the first city, as shown in Table No. (5), and its population increased due to growth and immigration from 109,733 people during 1987; That is: an increase of 46,683 people, after which the real population would rise from the required theoretical population, according to the rule, by 47,567 people, which is called the positive deviation from the rule. As shown in Table No. (6), as for the third-ranked city, which was occupied by the city of Heat instead of the city of Habbaniyah, after it surpassed it during this period in terms of population, it is noted that its percentage compared to the first city decreased to 21%, while its percentage during the previous period represented 22%, noting that the percentage required according to the rule is 33.3 from the first city; But with this decrease it still represents more than half of what is required within the base. We notice an increase in the negative deviation of the population to 15042 people from the norm, and the previous period was 10276 people, as shown in Table No. (6).

As for the cities from the fourth to the fourteenth rank, they have become closer to the ideal situation, as shown in Table No. (6), and the negative or positive deviations are less than they were in the previous period; This is a good indication of how close the base is

As for the small cities from the fifteenth to the twentieth rank, we notice that no development has been shown in their sizes, as they remained smaller than the theoretical sizes and within their locations away from the ideal state by more than half; than is required to match or approximate a straight line.

Urbanization and nomadism, a study in the geography of cities / Anbar province as a model

Log real population size	Log Rank	Log desired size	Desired size according to Ziff's rule	The true size of the population	City	Residents of the first city / residents of this city	Rank
5.094	0.000	5.094	124331	124331	Gray	١	١
5.040	0.301	4.793	62166	109733	Fallujah	١	٢
4.421	0.477	4.617	41444	26402	Hit	٥	٣
4.382	0.602	4.492	31083	24148	Habbaniyah	٥	٤
4.360	0.698	4.395	24866	22946	Modern	٥	٥
4.335	0.778	4.316	20722	21663	existing	٦	٦
3.989	0.845	4.249	17762	9756	moist	١٣	٧
3.955	0.9٠٣	4.191	15541	9021	about him	١٤	٨
3.949	0.954	4.140	13814	8902	leap	١٤	٩
3.918	1.000	4.087	12233	8295	field	١٥	١٠
3.853	1.041	4.053	11303	7129	narrators	١٧	١١
3.816	1.079	4.015	10361	6552	carabella	١٧	١٢
3.810	1.113	3.980	9564	6468	grapevine	١٩	١٣
3.807	1.146	3.948	8881	6421	Barwana	١٩	١٤
3.431	1.176	3.918	8289	2701	Obeidi	٤٦	١٥
3.378	1.204	3.890	7771	2393	Saqlawiyah	٥٢	١٦
3.234	1.230	3.864	7313	1716	Al-Baghdadi	٧٢	١٧
3.092	1.255	3.839	6907	1238	The backpacker	١٠٠	١٨
2.879	1.278	3.815	6543	758	Amriya	١٦٤	١٩
٢.٣٠٧	١.٣٠١	٣.٧٩٣	٦٢١٦	٢٠٣	Al-Nakhib	٦١٢	٢٠

Source: The researcher's work based on the results of the 1987 population census.

Figure (1): Logarithm of the real and desired size of the cities of Anbar Governorate in 1987
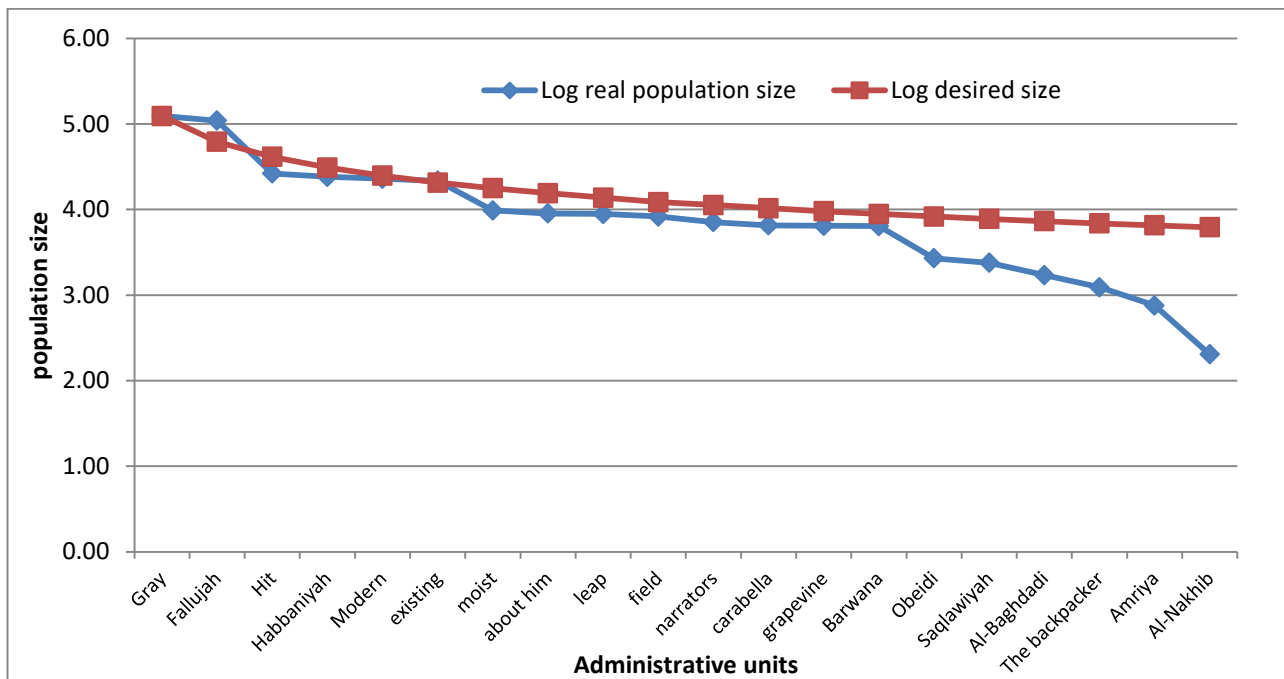
Source: from the researcher's work based on the data of Table No. (2)

2-4- Volumetric arrangement of the cities of Anbar Province in 1997

The urban system shrinks during this period to only seventeen cities; This is due to the administrative gracefulness that was previously referred to. Al-Rahaliya sub-district affiliated to the Fallujah district, Al-Baghdadi sub-district affiliated to the Hit district, Al-Haqlaniyah sub-district affiliated to the Haditha district, and Al-Karabila sub-district affiliated to Al-Qaim district were considered rural areas belonging to their districts. In the same period, a presidential decree was issued to consider Al-Walid as a sub-district belonging to the Rutba district.

This stage is more regular than the previous two stages in the size arrangement of the cities of the governorate according to the rank-size rule. Although the city of Ramadi (the center of the governorate)

remains at the top of the size arrangement, followed by the city of Fallujah in the second place, which came very close during this period to the size of the first city. As its population during this period reached 153,822 people; While the population of Al-Ramadi was 163,206 people for the same period, which constitutes 94% of the size of the first city, to end with this size every form of hegemony of the main city or the dominance of one city that characterizes most urban systems in developing countries.

As for the sizes of the average cities, they can be inferred from Table No. (3) in the second field. We notice an increase in the sizes of these cities to approach more than the previous two periods the ideal state of the rule, and the first city, for example, was five times larger than the third city during the previous periods and became no It represented only three times its size during this period; The same applies to most medium-sized cities, as shown in the aforementioned table.

Table (3) / the size arrangement of the cities of Anbar Governorate according to the rank rule - size for the year ١٩٩٧

Rank	Residents of the first city / residents of this city	City	The true size of the population	Desired size according to Ziff's rule	Log desired size	Log Rank	Log real population size
١	١	Gray	163206	163206	5.212	0	5.212
٢	٢	Fallujah	135822	81603	4.911	0.301	5.187
٣	٣	existing	47276	54402	4.735	0.477	4.674
٤	٤	Hit	37499	40802	4.61	0.602	4.574
٥	٥	Modern	36204	32641	4.61	0.698	4.558
٦	٦	Habbaniyah	29524	27201	4.513	0.778	4.47
٧	١٢	humid	13802	23315	4.434	0.845	4.139
٨	١٥	Obeidi	10721	20400	4.367	0.903	4.03

Urbanization and nomadism, a study in the geography of cities / Anbar province as a model

٩	١٦	about him	9937	18134	4.258	0.954	3.997
١٠	١٨	leap	8951	16321	4.212	1	3.951
١١	١٩	narrators	8441	14837	4.171	1.041	3.926
١٢	٢٠	grapevine	8090	13601	4.133	1.079	3.907
١٣	٢١	Barwana	7830	12554	4.098	1.113	3.907
١٤	٤٢	Amriya	3931	11658	4.066	1.146	3.893
١٥	١١٢	Saqlawiyah	1458	10880	4.036	1.176	3.594
١٦	٤٨١	Al-Nakhib	339	10200	4.008	1.204	3.163
١٧	٨٧٢	Al-walid	١٨٧	٩٦٠٠	٣.٩٨٢	١.٢٣	2.53

Source: The researcher's work based on the results of the 1997 population census.

Graph (2) / Logarithm of the real and desired size of the cities of Anbar Province in 1997
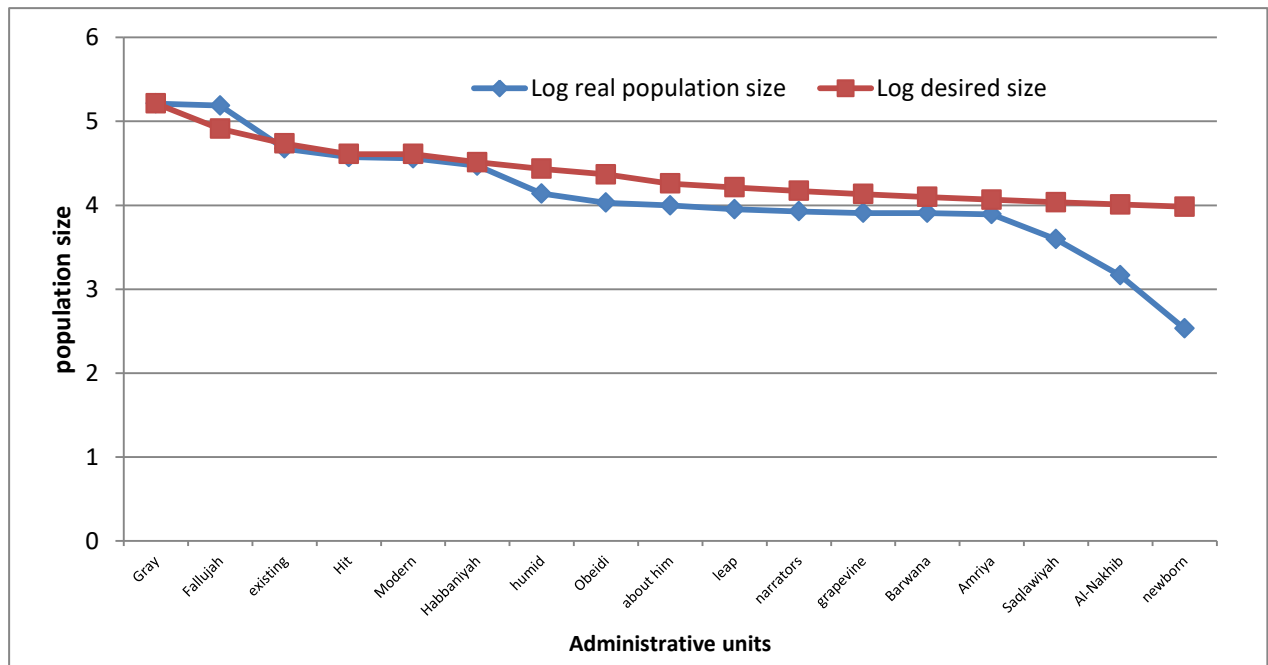
Source: The researcher's work, based on the data of Table No. (3)

As for the extent to which the sizes of the cities of Anbar Province correspond to the rank-size rule, this can be seen through the data of the table (percentages). For the rule, as it reached 29% of the size of the first city, bearing in mind that the percentage required according to the rule requires that the third city constitute 33.3% of the size of the first city, and the same applies to the fourth city up to the thirteenth city. Most likely, the values of negative and positive deviations for these cities decreased to approach the theoretical case; As shown in Table No. (3)

As for small cities, chart (2) shows that over the current and previous periods, the actual distribution of these cities was less than the theoretical distribution. more services in it; Which may help bridge the gap; Reducing it between these cities and the larger cities, and then will lead to reducing the increasing pressure on the big cities. and reduce pressure on the services available in it; Which leads to creating a state of balance in the urban system .

2-5- Volumetric arrangement of cities in Anbar Province in 2020

During this period, two changes appear to have taken place in the urban system in Anbar Governorate. The first is the increase in the number of cities to twenty-two cities. That is: an increase of five cities over the previous period; As for the second change, it was represented by the city of Fallujah ascending to the size pyramid of the cities of Anbar Governorate, with a population size of 271,907 people, surpassing the city of Ramadi, which is the center of Anbar Governorate and the administrative capital of the governorate, whose population reached 242,255 people for the same period. And that the volumetric arrangement of the cities of Anbar Governorate during this period shows that the urban system has become closer to the base compared to previous periods, with the exception of small cities, as shown in Figure 3. Through logarithmic tables and tables of ratios and

deviations, it is possible to note the development that occurred in the urban system from the year 1987 to 2020, the real and theoretical distributions are almost close to each other and show less difference in this period. This fact may indicate the success of government policies on protecting medium-sized cities and supporting their ability to accommodate the largest possible number of residents by increasing and developing existing services in these cities. Therefore, we see that the size of the first city has become 47; times the city's 18th size during this period; While the first city was 100 times the size of the eighteenth city in 1987, as shown in the hierarchical ranking tables; It is possible to know the extent of the differences between the first city and the rest of the other cities through these tables in order to know the extent of development that occurred for these cities during this period, which has become, as we mentioned, closer to the rule of rank and size than previous years. For example, the third city requires that it be 33.3% of the size of the first city. According to the rule, but in reality, this city constituted 22%, 21%, and 29%, 30%, over the study periods, respectively. The fourth city is supposed to constitute 25% of the size of the first city, according to the rule. But the reality is that this city constituted 26%, 19%, 23%, and 27%, respectively, of the first city, and the same applies to the rest of the cities. Which can confirm our words that this period is the closest to the regularity of what al-Qaeda brought to the fifteenth city. But this regularity changes and begins with the negative deviation from the sixteenth city, which represents the small cities that move away and show the greatest deviation from the rule; This may be due to the fact that the decisions according to which a certain population group is transferred in Iraq are for administrative or political reasons, and not for reasons related to size. Cities may have been created in the Anbar province with a small population size, as is the case in the city of Al-Walid or Al-Nukhaib or others, as well as other population gatherings within the classification

of villages, knowing that their size exceeds the population of the city of Al-Walid or Al-Nukhaib, such as the village of Al-Rayhanah or the village of Al-Sakrah affiliated to the city of Anah or other villages The others are located in the cities of Ramadi, Fallujah and Hit.

It is clear through our study of the urban system according to the rank-size rule through the data of the relevant tables. It can be said that there is a kind of balance in the urban system of Anbar Governorate to some extent, but it does not reach the ideal state; There is also a quasi-size arrangement that may not be ideal as stated in the rule, but it is somewhat close to what is required according to what I assumed. An important conclusion can also be drawn from the content of the rank rule

- Size, which is that the rule tries to show a consistent regularity between the sizes and ranks of cities and shows the relationship in the distribution of population in all cities in a way that is closer to regularity; The population tends to settle in all cities, so that the population is distributed in these cities to show a hierarchical relationship, as indicated by Zev, that the second city is half of the first city, and the third city is one-third of the first city..etc.

This coordinated arrangement may not be found except in some urban systems of developed countries for reasons that may relate to the pattern of migration of the population from the countryside to the city. medium-sized city; Then he moves to a bigger city, and this migration may take a long time. As for migration in developing countries, it takes place in one stage, and perhaps in Iraq, and in some cases it can be said that the city is the one who migrates to the countryside by an administrative decision to convert a village into a city.

Table (4)

Volumetric arrangement of cities in Anbar Province, according to the rank rule - size for the year 2020.

Rank	Residents of the first city / residents of this city	City	The true size of the population	Desired size according to Ziff's rule	Log desired size	Log Rank	Log real population size
١	١	Fallujah	271907	271907	5.434	0	٥.٤٣٤
٢	١	Gray	242255	153953	5.187	0.301	٥.٣٨٤
٣	٣	existing	80262	90635	4.957	0.477	٤.٩٠٤
٤	٤	Hit	72243	67976	4.832	0.602	٤.٨٥٨
٥	٥	Modern	50394	54381	4.735	0.698	٤.٧٠٢
٦	٨	Habbaniyah	34994	45317	4.656	0.778	٤.٥٤٣
٧	٩	humid	30795	38843	4.589	0.845	٤.٤٨٨
٨	١٠	Amriya	26.061	33988	4.531	0.903	٤.٤١٥
٩	١٢	about him	22753	30211	4.48	0.954	٤.٣٥٧
١٠	١٤	narrators	19656	27190	4.434	1	٤.٢٩٣
١١	١٥	leap	18442	24718	4.393	1.041	٤.٢٦٥
١٢	١٥	Barwana	18127	22658	4.355	1.079	٤.٢٥٨
١٣	١٨	field	15307	20915	4.32	1.113	٤.١٨٤
١٤	٢١	grapevine	12719	19421	4.288	1.146	٤.١٠٤
١٥	٢٢	Transit	12131	18127	4.225	1.176	٤.٠٣٨
١٦	٢٦	Saqlawiyah	10.368	16994	4.23	1.204	٤.٠١٥
١٧	٣٦	Al-Baghdadi	7623	١٥٩٩٤	4.203	1.23	٣.٨٨٢
١٨	٤٧	Fulfillment	5728	15105	4.179	1.255	٣.٧٥٨
١٩	٧٧	Euphrates	3546	14310	4.155	1.278	٣.٥٤٩
٢٠	١١٢	Obeidi	2428	13595	4.133	1.301	٣.٣٨٥
٢١	١١٨	Al-Nakhib	2303	12947	4.112	1.322	٣.٣٦٢
٢٢	٨٣٧	Al-walid	٣٢٥	١٢٣٥٩	٤.٠٩١	١.٣٤٢	٢.٥١١

From the researcher's work, based on the results of the Ministry of Planning's estimates for the year 2020.

Chart No. (3)

Logarithm of the real and desired size of cities in Anbar Province in 2020
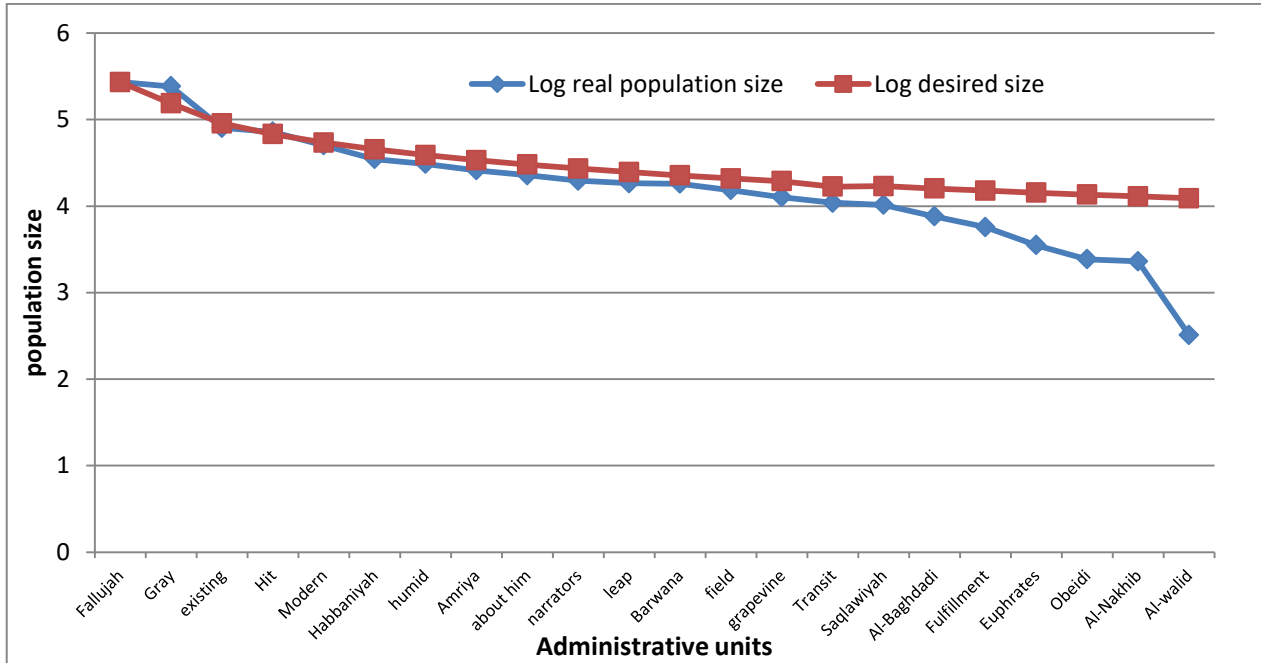
Source: From the researcher's work, based on the data of Table No. (4)

Table No. (5)

Percentage of city sizes relative to the first city in Anbar Governorate for the years 1987-1997-2020

	١٩٨٧	١٩٩٧	٢٠٢٠	Mattress Base Size
The first city	100% grey	100% grey	100% Fallujah	100%
The second city	88% Fallujah	94% Fallujah	89% gray	50%
Third city	21% hit	29% standing	30% standing	33.30%
Fourth city	19% Habbaniya	23% hit	27% hit	25%
Fifth city	18% are recent	22% are	19% are	20%

Urbanization and nomadism, a study in the geography of cities / Anbar province as a model

		recent	recent	
Sixth city	17% Al-Qaim	18% Habbaniya	13% Habbaniya	16%
Seventh city	9% moist	8% moist	11% wet	14%
Eighth city	7% about it	7% Al-Obaidi	10% Amriya	12%
The ninth city	7% leap	6% about it	8% about it	11%
Tenth city	7% field	5% leap	7% saw it	10%
Eleventh City	6% Rawa	5% Rawa	7% leap	9%
Twelfth city	5% carpel	5% vine	7% brown	8.30%
Thirteenth city	5% vine	5% brownie	6% field	7.60%
Fourteenth city	5% brownie	2% Amriya	5% vine	7.10%
Fifteenth city	2% of my slaves	0.9% field	5% transit	6.60%
Sixteenth city	2% field	0.2% disappoint	4% field	6.25%
Seventeenth city	1.3% Baghdadi	0.1% Walid	3% Baghdadi	5.80%
Eighteenth city	1% are nomadic		2% fulfillment	5.50%
Nineteenth city	0.6% Amriya		1% furat	5.20%
Twentieth city	0.2% Nakheeb		0.9% Obeidi	5%
Twenty-first city			0.8% Nakheeb	4.70%
Twenty-second city			0.1% Walid	٤.٥٠%

Source: The researcher's work based on the data of Table (2) (3) (4).

Table No. (6)

The difference between the real and ideal population size according to the rank rule - the size for the first city in Anbar Governorate for the years 1987- 1997- 2020

	1987	1997	2020
The first city	100% grey	100% grey	100% Fallujah
The second city	+ 47567 Fallujah	+72219 Fallujah	+79,538 grey
Third city	- 15042 Hit	-7126 existing	+7762 existing
Fourth city	- 6934 Habbaniyah	-3303 Hit	-3192 Hit
Fifth city	-1920 modern	+3563 Hadith	- 2983 Hadiths
Sixth city	+941 Al Qaim	+2323 Habbaniyah	-7725 Habbaniyah
Seventh city	-8006 damp	-9513 damp	-6022 damp
Eighth city	-6520 about him	-9680 Al-Obaidi	-5931 Ameria
The ninth city	-4913 leaps	-8197 about him	-5581 about him
Tenth city	-4183 fields	- 7371 leaps	-5638 Rawah
Eleventh City	- 4174 Rawa	-6396 Rawa	-4697 leaps
Twelfth city	-3809 Karabla	-5511 vines	-3391 browns
Thirteenth city	-3096 vines	-4724 brownies	-4197 fields
Fourteenth city	- 3460 Barwana	-7727 Ameria	-5019 vines
Fifteenth city	-5588 Al-Obaidi	- 9422 Sicily	-4488 transit
Sixteenth city	-5387 fields	-9861 disappoint	-4958 Sicily
Seventeenth city	-5597 Baghdadi	-9413 Alwaleed	-6263 Al-Baghdadi
Eighteenth city	-5669 nomads		-7018 fulfillment
Nineteenth city	-5785 Ameria		-8054 Euphrates
Twentieth city	-6013 Nakhib		-8355 Al-Obaidi
Twenty-first city			-7965 Al-Nakhib
Twenty-second city			-9004 Alwaleed

Source: The researcher's work, based on the data of Tables (2), (3), and (4)

3- Urban dominance in the urban system of Anbar Province

Domination did not come from a vacuum, as each city has its role and importance. Cities were established based on geographical factors such as topography, climate, proximity to water sources, military and industrial factors, the establishment of mines, the presence of plains and fertile lands, or religious and cultural factors. which may make it an external position; This status may make its relationship with neighboring cities based on the system of the idea of a central place. In this system, the city that has direct relations with other cities is the reason for this connection, which is the diversity of its economic activities and the large size of its population. The city with a higher rating is more important in terms of workers and more workers; So it is the one with the largest population.

So the hierarchical distribution must involve a functional specialization in which the increase is for the large and dominant cities that produce the goods and services required in the smaller cities; That is why the balance in the size distribution of cities is one of the most important factors that drive the process of economic development that helps the development of all cities in countries or regions alike. While countries or regions dominated by one or more cities in its urban system with the disappearance of the middle cities can stop the development process in most cities of the urban system.

To give a clear picture of the urban system in Anbar Province and highlight its most important features and characteristics; It has been relied on three indicators to measure the dominance through which it is possible to determine whether there is an urban domination or not and what is the extent of this domination, if any, and what is its form؟

These indicators are:

3-1- Mehta Index

The result of the Mehta Index can be derived by dividing the size of the first major city by volume by the size of the first four cities; Or in other words, the population of the first city can be divided by the population of the first four cities in terms of size sequence; Three time phases were adopted, as shown below, to determine whether there was a dominance of a particular city over the rest of the governorate's cities. The equation for this indicator has been applied as follows:

$$0.43 = \frac{124331}{24148 + 26402 + 109733 + 24331} = 1987$$

$$0.40 = \frac{163206}{37499 + 47276 + 153822 + 163206} = 1997$$

$$0.40 = \frac{271907}{72243 + 80262 + 242255 + 27907} = 2020$$

The calculations for the results of the Mehta Index are between zero and one; while zero indicates a lack of dominance; The correct one indicates the existence of absolute dominance, and between these two numbers there are gradual applications according to the result. In 1997, the percentage of this indicator decreased to 0.40, and this indicates a decrease in the level of dominance of the main city. From the city of Ramadi, which was the first city throughout the previous periods.

3-2- Index Primacy Index or four : Cities

This indicator differs from the previous indicator in that this indicator takes the four cities, but does not repeat the first city in the denominator, as is the case in the Mehta index; In this indicator, the first city is in the numerator and the next three cities are in the denominator, and the evidence of dominance in this indicator is clear if the value is more than one correct; As this al-Qahimah indicates that

the population of the first city exceeds the population of the following cities combined; In most studies, it is noted that the result of this indicator fluctuates around one in the developed countries, while the value in the urban systems of the developing countries is confined between 3-2. By applying the equation of this indicator to the cities of Al-Anbar Governorate, and through the results tabulated in Table No. (7), we note that the degree of dominance of the first city began to decrease over time. Then this percentage reached 0.68 in 2020, and this is due to the fact that the population concentration began to move towards the city of Fallujah, which enjoys the advantage of being close to the capital, Baghdad; The same applies to the city of Al-Qaim, which has also become an attractive city for residents, due to its location as a major gateway on the Syrian border. As well as phosphate factories, which attracted many manpower.

These results indicate that the urban system in Al-Anbar Province does not have a major city dominating the rest of the cities of the system, but this does not preclude saying that there is a population concentration in a certain part of Al-Anbar Province that reaches approximately 53.5% of the total urban population in The governorate consists of two cities, Ramadi and Fallujah, whose combined area does not exceed 8,307 square kilometers. This area constitutes only 6% of the total area of the governorate, which is 138,288 km^2.

3-3- Primacy Ratio

A third indicator was used to measure the degree of dominance in the urban system of Anbar Governorate. This is to ensure the accuracy of the results of the two previous indicators, and despite the multiplicity of mathematical formulas to reveal the degree of dominance, this indicator was chosen. Because it differs to some extent from the previous two indicators in terms of the mathematical formula, in the index of the two cities we take only two cities in the first urban

system: the next in terms of size; That is: the size of the population of the largest city is divided by the size of the next city in terms of sequence, as we mentioned in the theoretical chapter; If the result is greater than 2 integers, it indicates urban dominance. If less than that, the percentage of dominance of the first city over the rest of the cities decreased.

Through Table No. (7), whose data, in which three time periods were taken, reveal a decrease in the percentage of its dominance, as the result of this indicator ranged from 1.13 in 1978 and 1.06 in 1997 to 1.12 in 2020, and this matches the previous indicators in terms of their results that indicated on the decrease in its results in the recent periods compared to the first periods of the study; This also corresponds with what was extracted from the application of the order-size law in which we indicated that the last period of the study is the closest to Ziff's rule; That is, there is a kind of tendency towards urban balance in the governorate. And that all these results indicate that the urban system does not have the dominance or leadership of one city over the rest of the cities; That is: the image of this system is not classified within this common pattern in most developing countries; Which is characterized by a great dominance of only one city, but this does not mean that there is no imbalance in the urban system, it may be the dominance of my city over the rest of the cities of the province, namely Fallujah and Ramadi, where the urban population reached 58%, 58%, and 53.5% during the periods 1987-1997 -2020 respectively; And if you take this percentage at the district level, you can see that the percentage of the urban population in the two districts reached 67.1%, 66.5%, and 68.6% during the periods 1987-1997-2020, respectively; That is, this percentage is close to two-thirds of the urban population in the total governorate.

Table (7)

Results of the Two Cities Index and the Four Cities Index

The Dominance Index or the Four Cities Guide	Guide to Domination or Guide to the Two Cities	the year
٠.٧٧	١.١٣	١٩٨٧
٠.٦٨	١.٠٦	١٩٩٧
٠.٦٨	١.١٢	٢٠٢٠

From the researcher's work based on population censuses and estimates for the years 1978-1997-2020.

4- Discussion and conclusions

1- There is no significant divergence between the actual distribution of cities and the ideal theoretical distribution of city sizes as stated by the rank rule - size according to the 1987 census data, as the second city is larger than expected according to the rule; This confirms the lack of dominance of the first city, which is the city of Ramadi. Where the real population of the second city (the city of Fallujah) is 109,733 people; While the desired size, according to the rule, was 62,166 people; Because the first city (Al-Ramadi) had a real population of 124,331 people.

2- The size distribution tends to the base of rank and size more than the previous period. The actual logarithmic distribution, if we exclude the second city; It is the city of Fallujah, which will be similar to a large extent by the size distribution of the cities of the province. And that the difference between the theoretical and actual distributions is not very large, especially the cities that occupy advanced ranks within the size sequence up to the fourteenth rank.

3- Phase 1997 This phase is more regular than the previous two phases in the volumetric arrangement of the cities of the province according to the rank-size rule. of the size of the first city; As its population during this period reached 153,822 people; While the population of Ramadi was 163,206 people for the same period, which constitutes 94% of the size of the first city, ending with this size every form of hegemony of the main city or the dominance of one city that characterizes most urban systems in developing countries.

4- As for the 2020 stage, it appears that two changes have occurred in the urban system in Anbar Governorate, the first: the increase in the number of cities to twenty-two cities; That is: an increase of five cities over the previous period; As for the second change, it was represented by the city of Fallujah ascending to the size pyramid of the cities of Anbar Governorate, with a population size of 271,907 people, surpassing the city of Ramadi, which is the center of Anbar Governorate and the administrative capital of the governorate, whose population reached 242,255 people for the same period. And that the size arrangement of the cities of Anbar Province during this period shows that the urban system has become closer to the base compared to previous periods, with the exception of small cities.

5- In 1987, the Mehta index calculation result was 0.34. Because of this result, the level of dominance of the main city is within the desired level; In 1997, the percentage of this indicator decreased to 0.40, and this indicates that the level of dominance of the main city is low. The situation is no different in 2020. The dominance was also 0.40, and it does not differ from the previous period only in that the city of Fallujah has become at the top of the pyramid in terms of size instead of the city of Ramadi. Which was the first city throughout the previous periods.

6- The degree of dominance of the first city in the Four Cities Index decreased over time. The proportion of the first city in 1987 was 0.77 in relation to the total population of the next three cities in size; Then this percentage reached 0.67 in 2020, and this is due to the fact that the population concentration began to move towards the city of Fallujah.

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