

Urban Population Growth Trends in Jordan (2014-2044)

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ABSTRACT

THE present study aimed at determining the main trends of population growth in Jordan. It also attempted to reveal any potential variance among the rates of population growth in urban centers in addition to draw comparisons in between through measuring the rate of ten years up to 2044, taking the results of the last two censuses of 1994 and 2004 into consideration. The population growth rates were estimated by making use of the exponential equation. Besides, (Zipf) Rule was applied in order to determine both rank and size of the first cities in Jordan. For the purpose of clarification, the appropriate explanatory diagrams were provided. The study used the descriptive analytical method. The main findings indicated that the city of Amman would remain the first dominant city until 2044 in terms of the urban sector in Jordan. The study found out that the center territory of Jordan is regarded as an attracting point for people followed by the cities of Irbid and Zarqa.

Keywords: Trends of population growth, urbanization, Jordan

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Preface

The issue of housing had a great deal of interest in human thought for ages because it raised important questions for its close relationship with various fields. The study of spatial variation associated with the geographic distributions, the phenomena of population, demographic reality and future trends were conducted with the development plans to address the imbalance of different types and different forms (1, 2, and 3). The population is considered as the main element in dimensions of the planning process because they represent the purpose for which that process is done through following the appropriate scientific methods. As a result, measuring the rate of population growth rates delivered by natural and mechanical increase and the factors affecting it represents a way to estimate the economic, social, urban population needs (4).

The Department of Statistics conducted a set of Jordanian official census in Jordan. The data obtained referred to a rapid change in the increase of population. In 1952 the population was estimated about 586,200 people and 900,800 in 1961. The number rose to 2,133,000 in 1979 and 4,139,358 in 1994. It reached 5,103,639 people in 2004(5). In 2010, the estimated population is 6,113,000 people. Thus, the population growth rate was estimated by 2,0.2%, and the rate of natural increase of population was by 2.1%, whereas the time required to double the number of population is 31.5 years, noting that the area of the state is 89.318 km²(6). Jordan has scored the highest rates of population growth during the second half of the last century.

Table (1) shows the population growth rates, natural increase and net migration.

Temporal period	Rate of population growth %	Rate of natural increase %	Rate of net migration %
-1952 1961	4.8	3.2	1.6
-1961 1979	4.8	3.2	1.6
-1979 1994	4.4	3.6	.8
-1994 1999	3.3	2.7	.6
-2004	2.6	2.2	.4

The source: the Department of Statistics, the Year book, 2004 (7).

Population growth is associated with rate of natural increase and the high net migration rate in Jordan, especially when influenced by successive waves of Palestinian migration and the implications of the Iraqi occupation of Kuwait in 1990. Therefore, the government has focused on the issue of population growth in previous decades, as the population growth rate is still high, like that of other developing countries in spite of low rates of fertility and mortality. But the various kinds of migration have a direct impact on this increase. Jordan needs long time to reach the stage of zero growth in population (No Growth). Thus, this study explores the future trends of population growth for the following years.

The Problem of the Study

The study highlights the problem of the fact that Jordan is exposed to serious challenges in spite of limited natural resources to face the population growth reality and links it with the future. Thus, the identification of trends in population growth is the basis which must be highlighted. So, the study considers a defect in the spatial dimension of population distribution in Jordan, so as to create trends of population growth different between urban centers. The problem of the study is depicted in answering the following questions.

- 1- How is the population distributed in the urban centers of Jordan?
- 2- What are the future trends of population growth in urban centers of Jordan? Is there a certain growth of this distribution?
- 3- Is there a correlation between the size of the city population and rank within the future trends of population growth?

Significance of the study

The unplanned population growth is much considered as one of the challenges Jordan faces and has negative effects in light of inability to meet the different needs of the population. Therefore, the present study was to detect future trends of this growth, taking in to consideration the fact that the population growth is the outcome of three factors of population: human fertility, mortality and migration which all affect the population growth trends. The result of those correlations is varied(8,9).since the issue of population becomes an important part of developmental policies in Jordan (10).

Determining the rate of population growth is essential for any researcher in any planning work, whether at the national, regional or

local levels. This importance is attributed to determining the estimates of the needs of different population, whether in the intervening years between censuses or in the subsequent years. Indeed, the measurement of rate of annual population growth is an essential measure to lay down the change in the population size in any geographical area in a certain period of time (11) .The significance of this study is also depicted in the detection rates of population growth in urban centers in Jordan during the subsequent period in addition to highlighting the change in the rates of population growth trends in order to clarify the importance of linking future projections of population growth in urban localities with the needs of population distribution. It also helps detecting the urban system and its advantages and determining the change in the hierarchical structure of the urban system (12, 13).

The objectives of the study

This study aims at measuring the geographical distribution of population in urban centers and determining the trends of population growth. It also highlights the issue of spatial variation for the distribution of the population in Jordan and compares the patterns of this distribution in urban centers. The rationale of the study objectives are the following:

- 1 -The rapid population growth experienced by Jordan after Arab-Israeli wars, the return of large numbers of Jordanians from Gulf countries after Iraq's occupation of Kuwait in 1991, and the occurrence of variation in the patterns of distribution of the population in Jordanian cities.

2 -Determining the population size, growth rates and trends of population movements is very important for planners, especially for the planning of services and various facilities in the light of the change in population numbers and trends of population movements.

3 -Paucity of detailed studies about the patterns of population distribution in cities. This study is roughly considered the first study to explore the population trends.

Review of related literature

Many studies have dealt with population growth. Of the local studies examining this kind of growth area:AL- Hiyari (1984), Khamis (1985),AL- Sharida (1986), Samhah (1991), Khleifat (1995) and Musleh (1997). These studies addressed population reality in Jordan and the poor distribution of the population due to migration of population. The migrations were mainly in the major cities. These studies also dealt with the interpretation and comparison of patterns of population distribution (14-19).

Ajlouni (1989), Amira (1991), Hallaq (1995), Alkhtattenh (1999), Albayer (2009), and AL- Bustanji (2010) study the population trends, the rapid population growth, appreciation and its association with internal and external variables affecting the success of the developmental process. Such studies assess the needs associated with population growth such as the need for housing (20-25).

At the national level, AL-Aekl et al (1991) (26), addressed the estimates of population of Jordan for the period 1990-2005 through expectations of future fertility, mortality and migration by drawing three

models: the low, medium and high models. Their study found out that the level of Jordan witnessed a decline in fertility and mortality, especially neonatal and infant mortality and the decline in leaving immigration. On the other hand, Samha (1994) (27), identified the evolution of the weights of the population distribution of population in Jordan for the period 1952-1979.

AL-Abdullat (1997) (28) ,provided an analysis of Jordan's population, according to the components of population growth to form a framework for workforce development and economic growth in light of the increasing challenges faced by Jordan. Alklop (2009) (29), linked the historical context with the reality of population and identified the relationship between population growth and water security in Jordan until 2025. He found out that Jordan suffers from limited sources of water resulting in a lack of balance between the multiple needs of the water with population growth, leading to an imbalance status.

Al-Batoush (2012) (30), addressed the population growth rates in Jordan during the period of the sixties of the last century until 2009. He found out that there is a clear difference to the rate of population growth among the provinces of Jordan. Khamis (1986), Abu Sabha (1995), Basbous (1997), Ghuzlaan (1998), Aldowakat, (2002), and Samhah (2011) tackled with the impact of urbanization in the structure of the population of the Jordan cities, trends of the development of the urban system in Jordan, and urbanization and regional development strategies in Jordan (31-36).

At the Arab level, there have been conducted several studies such as Alhathlol (2003), Osman (2003),AL- Zahrani (2004), Qasim (2008) and

AL- Rabdawi (2010). However, at the international level, (Myerrs, et al. 2002), Wolfgang (2009), Cao, et al. (2011) and Dao (2012) are of the main studies tackling this prominent subjects. Notwithstanding, the present study is distinguished in that it deals with this rate so as to detect expectations of future growth for the years 2014.2024, 2034, and 2044, respectively to apply the base of rank and the optimal size of the urban sector of Jordan(37-45) .

The Statistical method

The study chooses the urban centers of Jordan, which are represented in the provincial administrative centers of twelve governorates to calculate population growth rates during the periods investigated by the study with a ten-year period fashion between each other. The study is based on the following aspects:

1- In order to calculate the annual growth rate in both urban centers during the periods of study and future years, the following equation will be used:

$$R = \ln (pt/p0) / t$$

R = annual growth rate.

PT = the number of population in the subsequent period of time.

Po = population in the previous time period.

T = the length of time

On studying the specific population growth rates, the volume of the growth in both urban centers and the future change in growth will

be identified, which, in turn, would indicate an increase, decrease or stability of the rates of population growth in urban centers.

2-the study used the application of the rule of rank and the optimal size of the urban system in Jordan.

Sources of data

The current study relied on population data from the census year (1994 - 2004) issued by the Jordanian Department of Statistics.

Methodology of the study

The study was based on the analytical and descriptive approach to determine the indicative prospective population growth trends.

Analysis and discussion

First, the distribution of population in urban centers:

To answer the first question, "How is the population distributed in the urban centers of Jordan?" .Table (2) shows the distribution of the population in these centers for the years 1994-2004.

Table (2) shows the distribution of the population in the centers governorate for the years 1994-2004.

Governo rate	1994	%	2004	%
Amman	156285	38.08	2074000	38.8
Balqaa	26100	6.67	356000	6.7

Zarqaa	639535	15.45	799000	14.9
Maadaba	107210	2.59	135000	2.5
Irbid	781715	18.16	952000	17.8
Mafraq	178820	4.42	250000	4.7
Jerash	123355	2.98	161000	3.0
Ajloun	94380	2.28	123000	2.3
Karak	169715	4.10	211000	3.9
Tafilah	62920	1.52	77000	1.4
Maan	79475	1.92	102000	1.9
Aqaba	79890	1.93	110000	2.1
Sum	413900	100	3530000	100

The source: findings of the census for (1994 - 2004) issued by the Jordanian Department of Statistics (5).

Data from table (2) refer that the population in these urban centers are unequally distributed and that the capital city of Amman accounts for the highest percentage, followed by cities: Irbid and Zarqa,

respectively. The study finds out that the rest of urban centers have low values as a percentage. Therefore, the data reveal that the population is concentrated in the middle part of the country, which consists of Amman, Zarqa, Balqa and Madaba. Figure (1) reflects the state of the population distributed geographically in these centers.

Second, trends in population growth in urban centers in Jordan

In order to answer the second question "What are the future trends of population growth in urban centers of Jordan and is there a specific growth to this distribution?" The identification of trends in population growth is based on the data of table (2), which in turn is based on the equation of population growth mentioned in the statistical analysis. The rates of population growth in these centers were measured during the time periods of 1994 – 2004. In addition, the trends of population growth for the years 2014, 2024, 2034 and 2044 were studied in the centers of Jordan governorates as shown in table (3).

Table (3) shows the trends of population growth for the years 2014, 2024, 2034 and 2044 were studied in the centers of Jordan governorates.

Governorate	Growth rate 1994-2004	2014	% for the year 2014	2024	% for the year 2024	2034	% for the year 2034	2044	% for the year 2044
Amman	2.7	2716866	39.15	355899	39.55	4662161	39.94	6107265	40.35

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Balqaa	2.5	457113	6.58	586945	6.5	753652	6.46	967708	6.4
Zarqaa	2.2	995615	14.53	1240613	13.8	1545899	1.2	1926309	13
Maadaba	2.3	169911	2.44	213850	2.38	269152	2.3	338755	2.23
Irbed	2.4	1210229	17.44	1538503	17.1	1955821	16.75	2486336	16.43
Mafraq	3.4	351237	5.1	493470	5.48	693299	5.94	974049	6.44
Jerash	2.7	210904	3.04	276277	3.7	361913	3.1	474093	3.13
Ajloun	2.6	159522	2.30	206889	2.3	268321	2.30	347994	2.30
Karak	2.2	262922	3.79	327621	3.64	408241	3.5	508700	3.36
Tafilah	2.0	94048	1.35	119870	1.28	140303	1.2	171366	1.13
Maan	2.5	130971	1.89	168170	1.87	215935	1.85	277266	1.83
Aqaba	3.2	151484	2.57	208613	2.4	287287	3.46	395631	3.4
Sum	2.6	6938576	100	8998848	100	11670877	100	15136312	100

The source: percentages and rates of population growth are measured by the researchers due to the data of censuses of 1994 and 2004, DOS.

Table (3) refers that the rate of population growth in Jordan in general during the period between (1994-2004) amounted to 2.6% per year and that there is a difference in the trends of population growth in urban centers in Jordan, This explains the trends in population growth and movements of the future population growth rates. The population growth rate expects that the rate continues increasing in the decimal categories specified in years, which were measured to the year 2044 (see Figures: 2). The capital city will remain with the highest rate, followed by: Irbid and Zarqaa, respectively with the possibility of occurrence of very simple changes in growth rates between Balqa and Mafraq and other small cities to change their order in 2044.

It is clear from tables (2 and 3) that the rates of population growth in the governorate centers during the period (1994-2004) were varied, that is, these rates reach more than 5% in both Amman, Madaba, Irbid, Tafileh and Aqaba. Besides, the growth rates are higher than the rate of natural population growth and movement to these cities, especially from the countryside to the cities and Palestinian migrations after the Arab-Israeli wars. The rates of population growth in Tafila, Zarqaa, and Madaba were less than the natural growth rate in Jordan in general. That is because of the migration of the population of these cities either abroad or to the larger cities, Thus, Balqa, Jerash, Ajloun and Aqaba are considered as center to expel the population. Figure (2) highlights population growth rates and future trends for the years 2014-2024. On

the other hand, figure (3) shows the results of the calculation of the index measuring the future rates of population growth.

It is clear that the rates of population growth in governorates centers during the period were the highest Mafraq with (3.4%), Aqaba with (3.2%); these rates were higher than (2.5%). Other cities have shown moderate growth except for Tafila. In addition all growth rates were above the rate of natural growth, and this is evidence of ongoing population movement to urban centers (cities) in spite of the disparity in growth rates between different centers. Also, the highest population growth rates were not in the big cities such as Amman, Zarqa and Irbid, but were in the medium-sized cities like Jerash, Mafraq and Aqaba. This rate will remain the same in the coming years up to 2044 as identified in Figure (3).

Further, the governorates centers in the territory of South Jordan have undergone rapid growth rates, as it is in Aqaba. That is due to the existence of activities and investments in this city which attract people to work in. The results indicate that the urban centers still attract the population and the growth rates of population are higher than the rate of natural growth. Yet, the growth rates have decreased in the larger cities such as Amman, Zarqa and Madaba, while they have increased in smaller cities such as Ma'aan, Karak and Ajloun. Moreover, the results of analysis of trends in population growth show that the growth rates in urban centers will remain the same with simple changes in the growth of the population of some small cities, which means that the major urban centers in Jordan will be the same. Besides, the movement of people

and their attitudes tend slowly towards the cities with small and medium sizes (46).

Thirdly: the application of the rule of rank and the optimal size of the urban system in Jordan

In order to answer the third question, "Is there a correlation between the size of the city population and its rank within the future trends of population growth? The rule of rank and optimal size of the urban system was used in order to reveal the relationship between the sizes of cities and ranks corresponding to these cities in an urban system during the periods (1994 - 2004). The rule is that if the size of the first city in the country or territory was determined, the rank occupied by any other city in this region or country is determined by the size of the population because the rule states that the size of the second city equals to the half of the size of the first city, and the size of the third city is equal to one-third of the first city and so on.

In other words: **the size of the first city = the size of the concerned city x the rank of the city concerned.**

The rule of size and the optimal size was developed by (Zipf), knowing that he is the first one determining the idea of this rule, which was preceded by others, including Auerbach (1913), Lotka (1924) and Singer (1936), (see: Ismail, 1988) (47). This rule is an appropriate measure to identify the degree of balance. Table (4) reveals the application of this rule on the first four cities of Jordan due to the rate of population growth set in table (3).

Table (4) reveals the application of this rule on the first four cities of Jordan due to the rate of population growth set in table (3).

Th e r a n k	City	The ratio of the city to the size of the 1 st city in 1994	The ratio of the city to the size of the 1 st city in 2004	The ratio of the city to the size of the 1 st city in 2014	The ratio of the city to the size of the 1 st city in 2024	The ratio of the city to the size of the 1 st city in 2044
1	Am ma n	—	—	—	—	—
2	Irbe d	%48	%46	%44	%43	%40
3	Zar qaa	%40	%38	%37	%35	%31
4	Bal qaa	%17	%17	%17	%16	%16

The source: the researchers due to table (3).

After applying the rule of urban dominance (hegemony) on these years, the table (5) shows the results of the calculated values.

Table (5) shows the results of these calculated values.

Value	year
0.98	2004
1.02	2014
1.05	2024

1.09	2034
1.13	2044

The source: the researchers.

Table (5) shows that the values derived indicate that there is no urban balance in Jordan and that during the coming years the control of the capital Amman and its hegemony will increase. This indicates that migrants move for different reasons to the first city in Jordan. Figure 4 shows the aspect of being Amman the first city of Jordan.

Conclusions and recommendations

The present study concludes that there is a great relationship between population growth and urban growth in the various urban centers, and that the expected population growth rate of future measured will increase the size of urban centers. Moreover, Jordan will undergo accelerated urban growth with the dominance of the city of Amman. In addition, there is a huge difference between the rate of population growth and urbanization of the capital and the rest of the urban centers of Jordan.

Certainly, developed and planning operations will affect the movement of construction for the presence of land as well as work on the spread of jobs and different economic activities, and the availability of infrastructure. The city of Amman may become affected by the lack of land space sufficient to accommodate the new population although some of these available spaces are very high.

The study recommends developing a plan to create urban centers, which are located outside the boundaries of major cities to encourage

the idea of urban balance between the first cities with the rest of the other cities and to encourage the vertical pattern of urbanization. Setting a long-term plan facing the growing problem of population growth is highly recommended.

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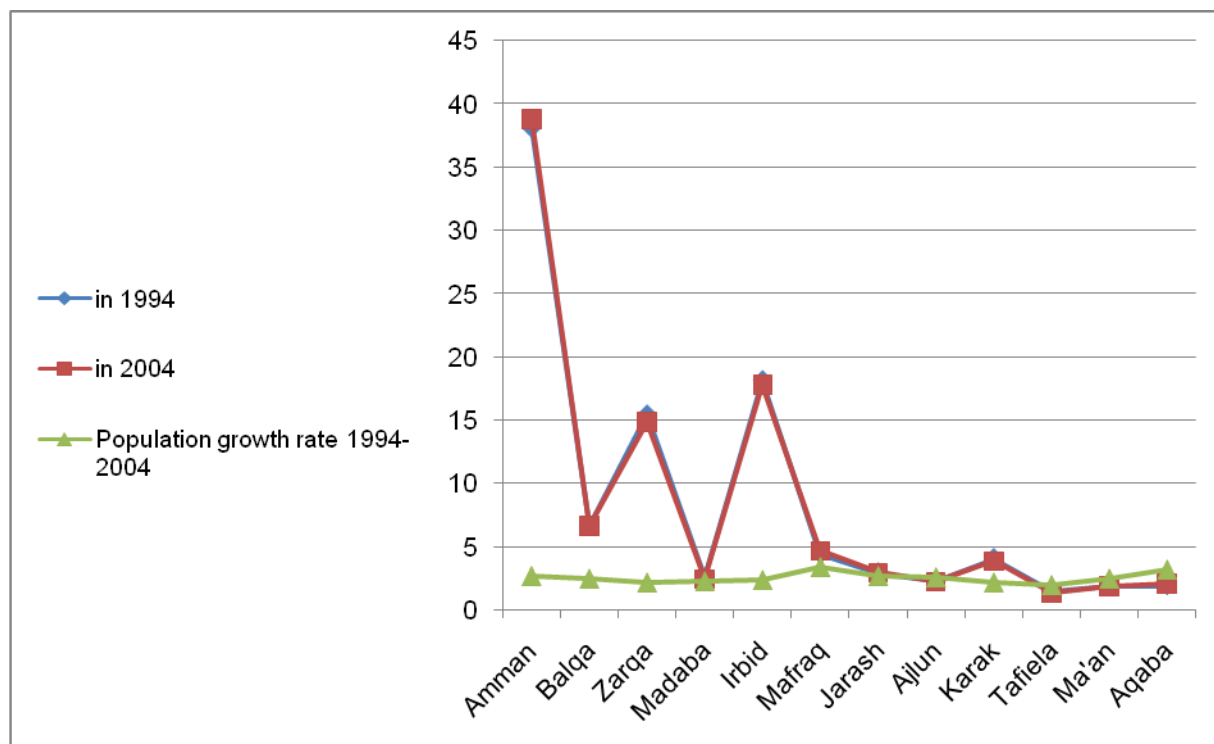
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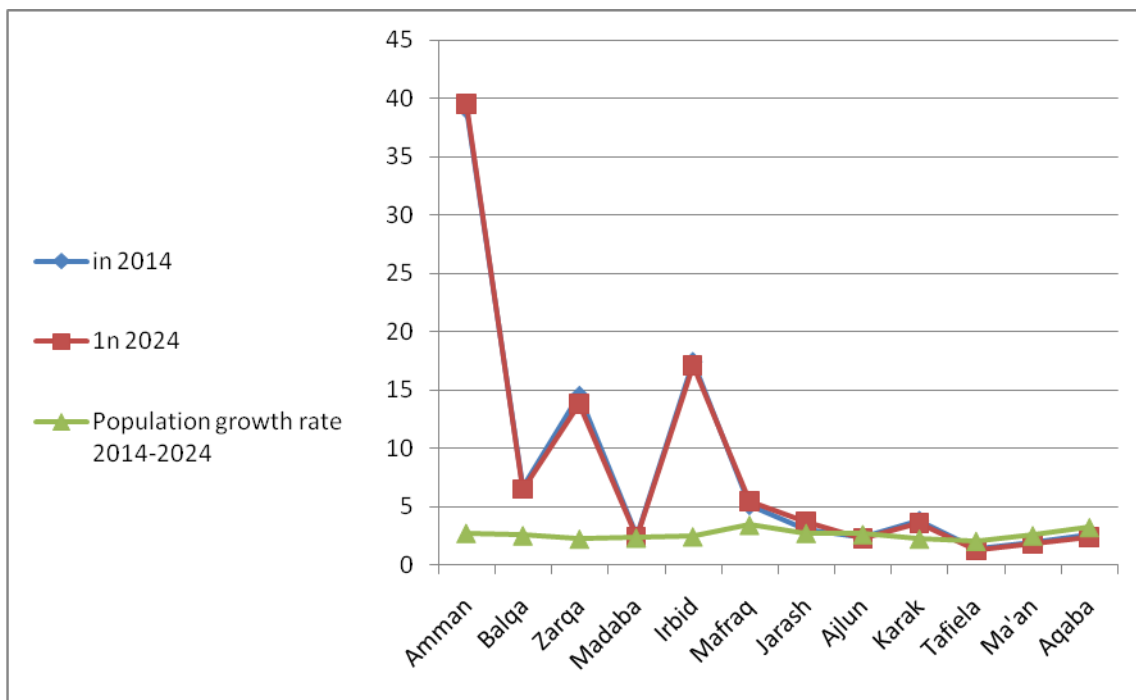
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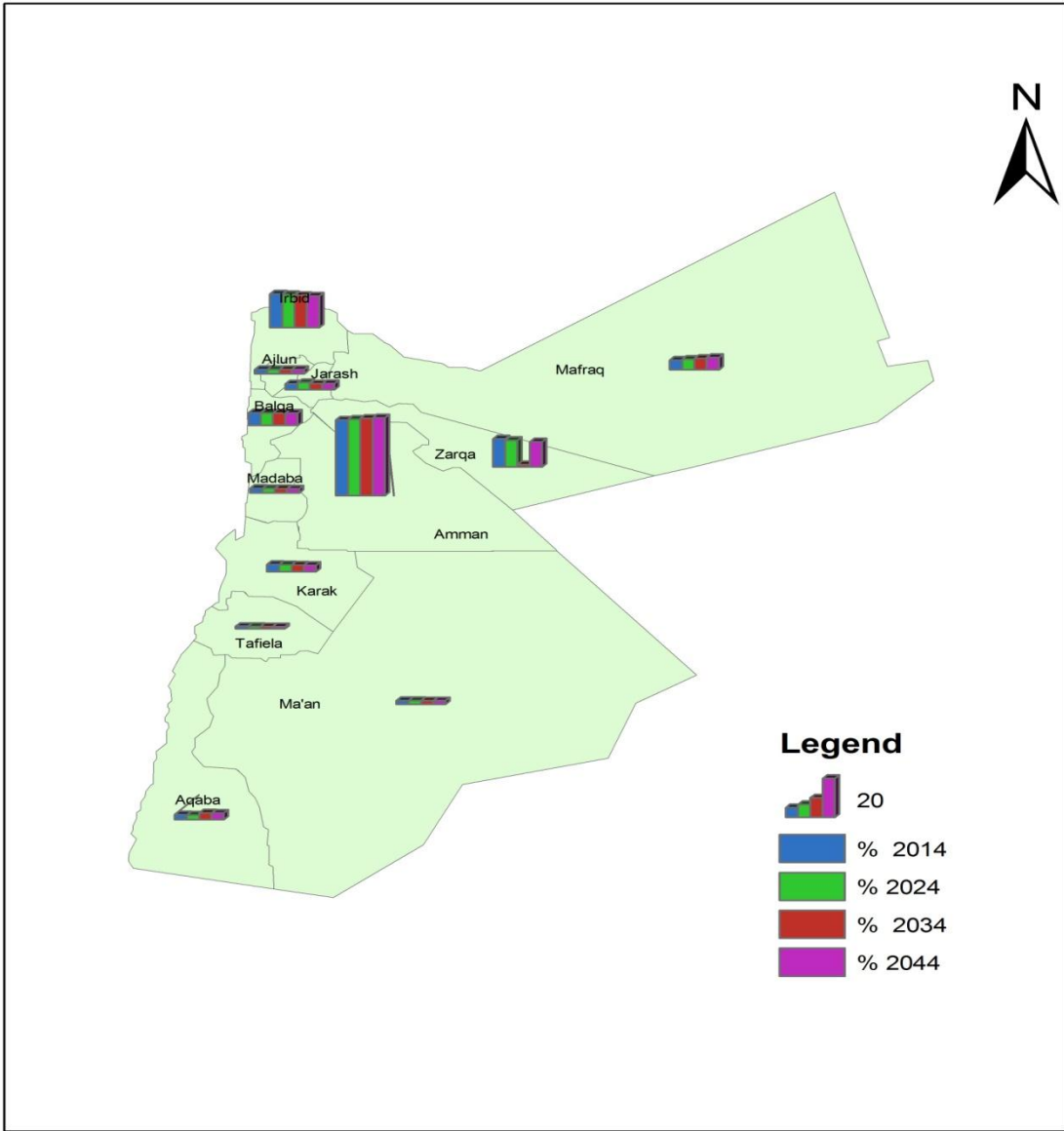


Form (1): rates of population growth in urban centers of Jordan from 1994 – 2004.

Source: prepared by the researchers based on the results of statistical analysis.

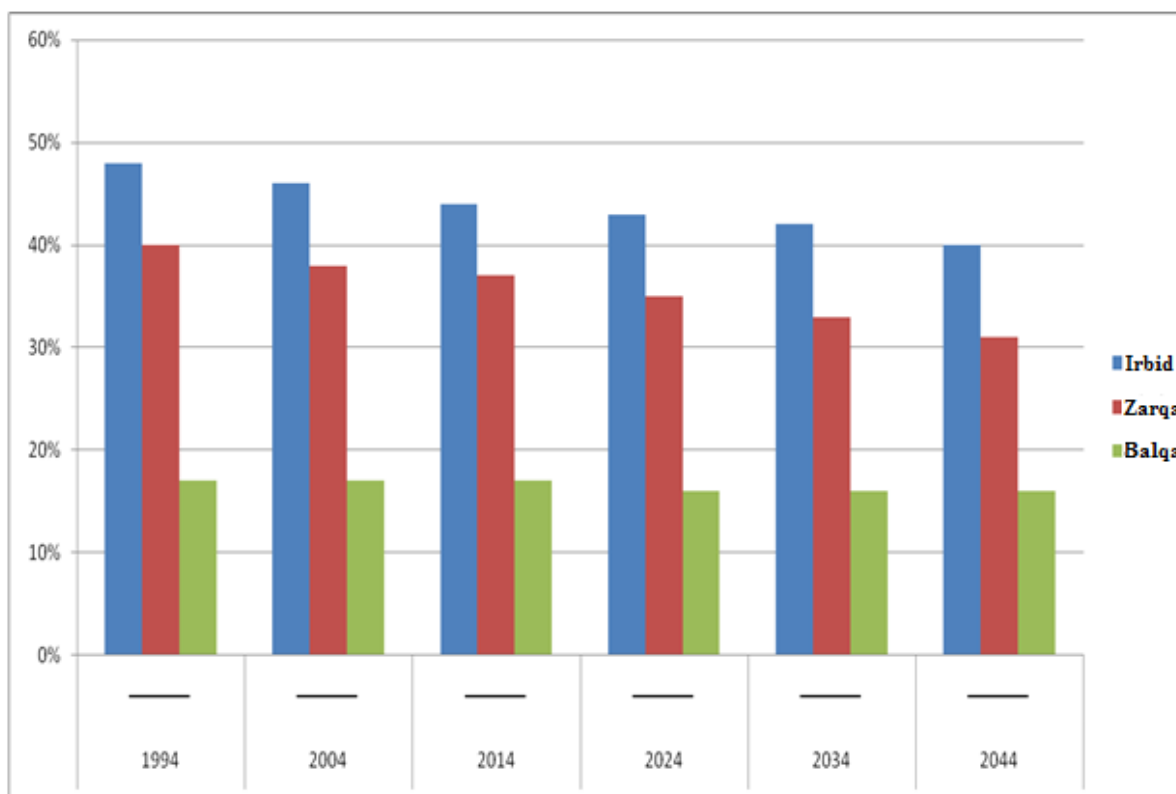


Form (2): rates of population growth in urban centers of Jordan from 2014 - 2024.



Source: prepared by the researchers based on the results of statistical analysis.

Form (3): geographical distribution of the percentage rates of population growth, according to provincial centers for the years specified.



Form (4): the application of base grade and size of population in urban centers of Jordan.

Source: prepared by the researchers based on the results of the application table (4).