International Journal of Innovative Technologies in Social Science

e-ISSN: 2544-9435

Scholarly Publisher
RS Global Sp. z O.O.
ISNI: 0000 0004 8495 2390

Dolna 17, Warsaw,
Poland 00-773
+48 226 0 227 03
editorial_office@rsglobal.pl

ARTICLE TITLE	A STUDY OF THE URBAN FEATURES OF THE URBAN SYSTEM IN THE ALGERIAN CITY OF CONSTANTINE FOR THE PERIOD (1987–2022)
ARTICLE INFO	Nacer Fethi. (2024) A Study of The Urban Features of The Urban System in The Algerian City of Constantine for The Period (1987–2022). *International Journal of Innovative Technologies in Social Science*. 3(43). doi: 10.31435/ijitss.3(43).2024.3207
DOI	https://doi.org/10.31435/ijitss.3(43).2024.3207
RECEIVED	10 August 2024
ACCEPTED	24 September 2024
PUBLISHED	30 September 2024
LICENSE	The article is licensed under a **Creative Commons Attribution 4.0 International License.**

A STUDY OF THE URBAN FEATURES OF THE URBAN SYSTEM IN THE ALGERIAN CITY OF CONSTANTINE FOR THE PERIOD (1987–2022)

Nacer Fethi
Ph.D. Student, Institute of Earth Science and Universe, University of Batna2

ABSTRACT

The study of the urban system today is one of the important topics in the field of regional planning and urban engineering. It focuses on urban centers from both external and internal perspectives, considering their interaction and interconnection in forming the urban system.

This study attempts to explore the characteristics of the urban system in the city of Constantine over the period (1987–2022) by addressing the various changes that occurred in the dynamics of urban movement as well as the manifestations of regional integration and their influence on the city's size and functions. The study also emphasizes the importance of examining the balance within the urban system and its interactions within the urban network.

The results of the study indicate that the characteristics of the urban system exhibit urban dynamics that have developed over a specific period, reflecting a distinctive urban system during a phase where the phenomenon of "urban sprawl" has emerged in alignment with the interests of the city of Constantine. Over time, the urban system evolved to lean towards institutional and legislative balances and the stability of urban networks, while dismantling spatial disparities and integrating the connections within the urban network.

KEYWORDS:

Urban System, Urban Vision, Urban Migration, Balance in The Urban System

CITATION:

Nacer Fethi. (2024) A Study of The Urban Features of The Urban System in The Algerian City of Constantine for The Period (1987–2022). *International Journal of Innovative Technologies in Social Science*. 3(43). doi: 10.31435/ijitss.3(43).2024.3207

Introduction.

Studies focusing on urban regional systems have been numerous, even if the concepts of network and system are quite old (Ciline,2004) The first urban nuclei began to take shape and with them began activity and interaction. They organize themselves into integrated groups that reflect the existence of an urban system defined by its distinctive characteristics. Studies interpreting the urban system emphasize the strength of the link and the overlapping functional characteristics through which it seeks to achieve sub-goals that are expected to be achieved (El chamberi,2017).

The urban system with all its elements is a fundamental pillar in driving development and addressing urban problems Governments worldwide are beginning to tackle the problems caused by urbanizationin the 21st century (He,CHem,2024,P2), especially those that are newly emerging. Cities within the concept of the system are points that form essential components in the structure of the urban system. Studies have focused on studying the sizes of cities, their distances from each other, and controlling the dynamics of the urban phenomenon spatially and temporally. The research trend crystallized in studying the city's rank and its relationship to its size, along with studying the patterns of distortions specific to the urban network from various aspects. Studies were distributed, especially in studying spatial distribution patterns. Attention to this type of study facilitated the way to develop strategies for developing the urban system (Ali abda,2017).

An important sector of studies concerned with the city and its relationship to its regions tries to study the most important interactions between cities and their dynamics, whether in their internal or external aspects.

With the development in studying the control of movement and its control, urban systems have increased in the development of methods and approaches that try to ... especially those located inside and outside the systems, i.e., studying their various effects.

The importance of studying the urban system for any group is highlighted by the expected benefits from it, and this is through knowing the extent of the balance of its relationship with regional planning and development, and in the ways of restoring the necessary development efficiency, and the efficiency and ability of the system concerned to keep pace with rapid developments, especially from the side of increasing population and urban concentrations.(Fraji,2017)Studying the urban system makes us understand more of the relationships and urban dynamics in it, in terms of the various economic, social, spatial, and even environmental changes temporally and spatially.

The study focused on the Constantine urban region, which has experienced rapid dynamics that affected its rural and urban centers alike. The urban areas were greatly affected after independence by significant increases in the number of cities and their sizes, at the expense of other rural and urban areas, which left significant repercussions in many regions and urban systems. The Constantine urban system was also affected by the urban policy related to the establishment of new cities, which was considered a new way to control the growth of large cities and establish an urban fabric. (Official gazette ,2006)The Algerian government's policy towards new cities is also evident through the general strategy outlined in the "Algeria Tomorrow" project. (Algeria tomorrow ,1995)Our study aims to highlight the urban characteristics within the Constantine urban system for the period (2022-1987), which witnessed rapid urban dynamics that had a profound impact on urban characteristics. The study covers a period of 35 years.

Research Methodology.

In an attempt to measure the urban system and identify its characteristics from various aspects, the study relied on several methods and approaches that we consider important in extracting the changes related to the Constantine urban system. The most important methods are:

Historical Method:

This method was employed to trace the development of the urban system within the period (1987-2022). This tracking was related to the size distribution of urban centers and the spatial distribution of urban centers, and to interpret the changes that occurred in the urban region as much as possible.

Statistical Method:

The statistical method was utilized to understand and interpret the relationships related to the dynamics of the system. Using the statistical method was also used to match the figures related to the urban reality with the known methods of spatial and geographical distribution of the network system with the characteristics of the urban system from its various aspects. The study also addressed the study of the spatial dimensions of the hierarchical size within the urban system, a study that addressed the issue of dominance and imbalance within the urban system network. The research work addressed the nature of the distribution of urban centers, and the elements explained express the characteristics of the study and research on the phenomenon from its various aspects.

The cartographic method gives the phenomenon a spatial dimension by drawing maps that reflect the distribution of urban centers. Maps were drawn using the QGIS program

Data collection To achieve the research objectives, we collected data from its sources, and we were keen that the data was characterized by:

- Providing information and completing any gaps in it
- The information should be up-to-date, expressing the population figures of urban communities for the year 1987 and data for the year 2022
- The information is characterized by its official nature, meaning that its source is administrative bodies responsible for providing this information and data for the year 1987 (ONS,1987) and the data for the year 2022 from the administrative body (DPSD,2022)
- We were keen that the data was very consistent with the research objectives

In addition to the information available from the bodies concerned with collecting and providing data, we also consulted sources related to the study, such as books, publications, and magazines, whether related to the topic or the field of study.

The study area was selected to be the Constantine Wilaya due to the compatibility of the study objectives with the urban dynamics of the region and the availability of information. The study period (1987-2022) was chosen for objective reasons related to the structural urban transformations that occurred during this period, which are significant for the study. Figure (2) shows the presence of (8) urban centers in 1987, which doubled

to (16) urban centers in 2016. Urban centers are defined according to the criteria adopted by the National Statistics Office, specifically the urban network for 2008 (Algerian urban network,2008).

Methods Used in the Study.

To achieve the study objectives, a set of statistical methods were used to process, analyze, interpret, and give meaning to the data. The study was conducted as follows:

1. Study of the Spatial Variation of Urban Centers: This aspect was illustrated through maps showing the geographical distribution of urban centers for the periods 1987 and 2022.

2. Study of Dominance and Imbalance in the Sizes of Urban Centers: Important indicators were used for this aspect, including:

2.1. Mark Jefferson's Rank-Size Rule: This rule assumes the existence of a dominant primary city within the region, serving as a central hub and concentrating all authorities. According to Jefferson, the primary city represents 100%, while the second city is estimated at 30% and the third city at 20% compared to the population of the primary city. If the actual distribution aligns with Jefferson's distribution, it indicates an organized network with a tendency towards balance.

2.2. Ziff's Urban Hierarchy Index: This index measures dominance by dividing the population of the first city by the population of the second city, expressed as:

$$A = P_1/P_2$$

Where:

- A: Urban hierarchy value
- P1: Population of the first city
- P2: Population of the second city

According to Ziff:

- If the result is equal to (2), it means it aligns with Ziff's model.
- If the result is greater than (2), it indicates a dominant city, or a "primate city".
- If the result is less than (2), it means the urban system has multiple centers.

2.3. Imbalance within the Urban System: To assess the imbalance in the distribution of sizes and urban centers, the Lorenz curve and the Ginny coefficient were applied.

- The Lorenz curve: which measures the relationship between the distributions of a phenomenon within a given area, revealing the degree of deviation from an ideal distribution (Ali Ibrahim,1999). It graphically represents the distribution.

Ginny Coefficient.

The Ginny coefficient is based on the Lorenz curve data. However, Ginny attempts to demonstrate the relationship by establishing a numerical measure of inequality in the distribution of cities. If the ratio approaches (1), it indicates a greater deviation from the ideal distribution, meaning a higher level of inequality. Conversely, if the ratio approaches (0), it indicates a more ideal distribution, meaning a more equal distribution. The formula is as follows:

$$G = 1 - 1/10000 \sum (S+Si-1)N-1$$

- G: Gini coefficient
- S: Aggregate ratio of the value of i
- N_1: Percentage of the value of the variable relative to category i
- N: category’s number

3. Urban Hierarchical Size.

The researcher George Ziff proposed a rule stating that the size of a city is directly proportional to its rank. The purpose of this rule is to determine the level of balance within the urban system. Cities are ranked in a hierarchical order based on their size. The rule suggests that the theoretical population of the second city should be half that of the first city, the third city should be one-third of the first city, and so on for the entire urban system. To calculate the theoretical size of the second city, the formula is:

N = population of the first city / city Rank

Where:
- N: Theoretical size of the city

4. Spatial Distribution Pattern.

To better understand the characteristics of the Constantine urban system, we applied the "closest neighbor" method to determine the degree of spatial organization of urban centers. This involved assessing whether the distribution of urban centers is clustered, dispersed, or random. The process involves comparing the obtained distribution values with the values of the closest neighbor index. The general formula is:

$RN = 2D\sqrt{B/A}$

Where:
- RN: Closest Neighbors Relationship
- D: Distance rate
- B: Number of urban centers
- In essence, the Ginny coefficient measures inequality in the distribution of cities, the urban hierarchical size rule assesses the balance within the urban system, and the closest neighbor analysis determines the spatial distribution pattern of urban centers. These methods were used to analyze the urban characteristics of the Constantine region.
- A: Region area

The points in the research topic represent city centers. The value of the closest neighbor index is between (0) and (2.15). When the closest neighbor index equals (0), it means all the points are concentrated in a single point. If the index equals (1), it indicates that the distribution is regular, while if the index result is (2.15), it means the distribution is random. For the importance of applying the index, we utilized it during the study period (1987–2022).

Localization of the Study Area.

The Constantine provincial region is located in the heart of northeastern Algeria. The region is historically rich, having been home to many civilizations, starting from the Roman period, passing through the Islamic conquests, and up to the era of independent Algeria. Constantine, the capital of the region, was formerly known as the city of Cirta and the capital of Numidia, dating back to 300 years BCE. The region is bisected by the large Errimel Valley, which divides it into two parts. The Constantine provincial region is considered one of the most important regions of Algeria.

It is bordered to the east by Guelma province, to the west by Mila province, to the north by Skikda province, and to the south by Oum El Bouaghi province. The provincial area spans 2,187 km². Administratively, the region consists of municipalities and (6) districts (Boukerzaza ,1996) ,such as Constantine District, El Khroub, Hamma Bouziane, Ain Abid, etc. It is worth noting that many urban centers are municipal headquarters.

During the colonial period, the Constantine provincial region served as the governorate of eastern Algeria, managing its administrative affairs since the colonial period began in 1830. Its current administrative divisions are the result of the administrative restructuring of 1984. For further clarification of the localization of the provincial region, refer to figure (1).

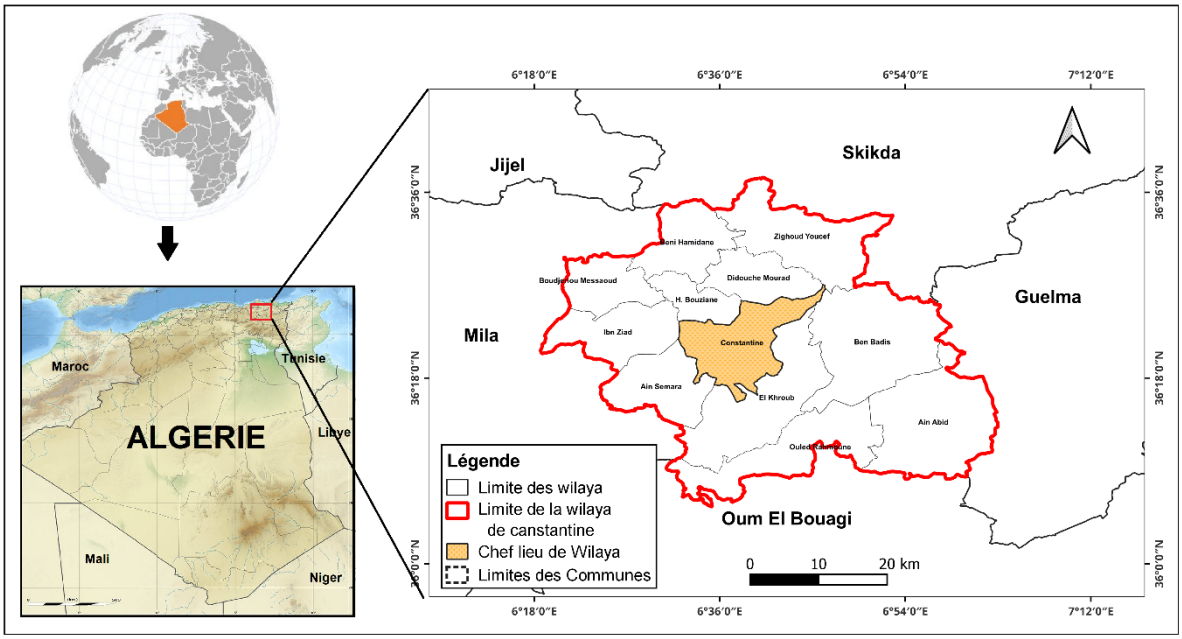

Fig. 1. Localization of Study area Source: Nacer Fethi based on data (dpsp) for the a year 2022

The region is characterized by diversity, both in its topography and climate. The topography includes various types of terrains, such as hills and mountains, which are often intersected between the north and south. This diversity in topography is reflected in the climate, which is generally cold in winter and hot in summer. Overall, the region is endowed with diverse natural features, and human interventions throughout history have contributed to its uniqueness.

Results and Discussion.

To achieve the research objectives by applying certain methods and approaches to define the Constantine urban system, we focused on a specific period, namely (1987–2022). The choice of this period is due to several reasons, including:

- Understanding the developments in the characteristics of the phenomenon.
- Availability of official and updated information.
- The time span of (35) years is sufficient to clarify urban characteristics and provide interpretations.

The geographic distribution of the urban centers network for the year (1987) indicates that the number of cities reached (8) cities with a population exceeding (5,000) inhabitants, according to the classification of the National Office of Statistics (12), with a total population estimated at (560,519) inhabitants. The urban population constituted (69.12%), which indicates that more than 50% of the provincial population were urban residents.

By contrast, the situation in (2022) changed significantly, with the total population estimated at (1,128,790) inhabitants. The urban population percentage increased substantially compared to (1987), reaching (84.37%). This is a significant percentage of urban residents, reflecting the importance of urban centers, as their number increased to (16) urban centers. The region also experienced growth in the sizes of urban centers, especially when compared to (1987). The situation is further clarified in Figure (2), which shows the sizes and numbers of cities during the study period.

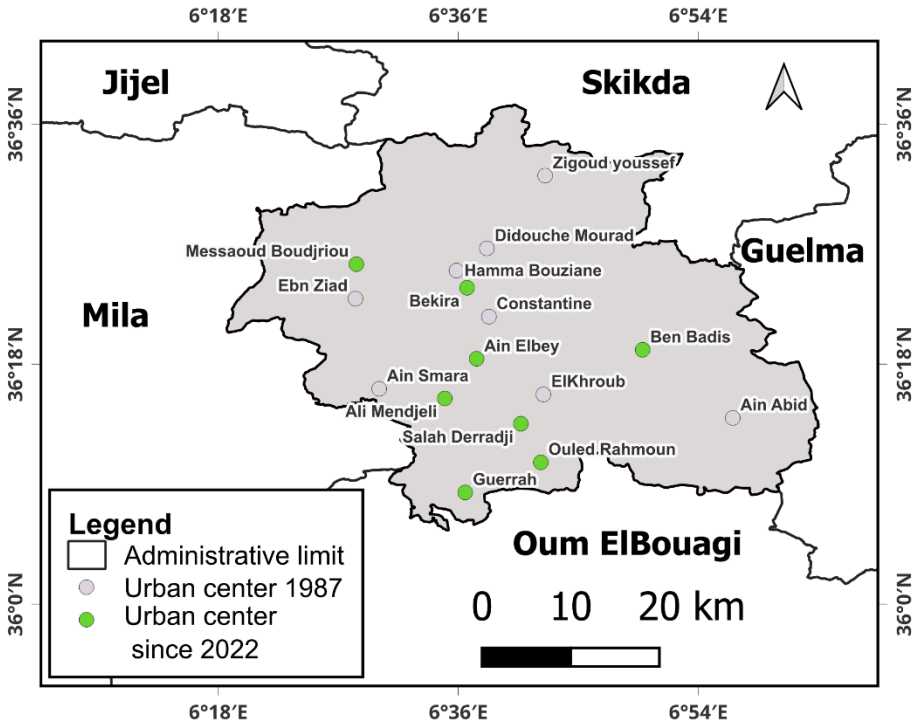

Fig. 2. Distribution of urban cities in the Constantine state region for period(1987-2022) Source: Nacer Fethi based on data (dpsp) for the a year 2022

The initial observation reveals that the city of Constantine maintained its relative leadership, with clear dominance in (1987), as (78.6%) of the urban population resided in Constantine. However, by (2022), this dominance declined to (41.30%) with the emergence of new cities, particularly Ali Mendjeli, which had a population size of approximately 250,000 inhabitants. Furthermore, many centers became urbanized by (2022), whereas in (1987), they were predominantly rural.

The analysis indicates significant urban dynamics and transformations in the urban landscape, especially in the geographic distribution of cities in terms of their numbers and sizes.

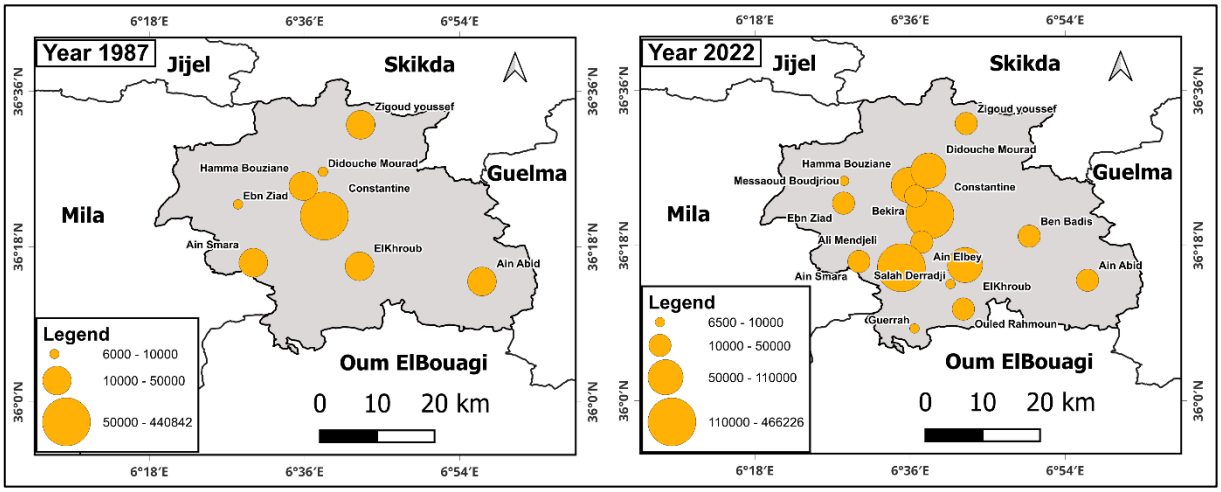

Fig. 3. Distribution of the numbers and sizes of cities in the Constantine state region for the period (1987-2022) Source: Nacer Fethi based on data (0ns , dptb) for years (1987, 2022)

To achieve the study's objectives, we analyzed and measured urban dominance and imbalances in the provincial region through Mark Jefferson's first city index and Ziph's urban hierarchy application during the study period (1987–2022).

By applying the first city law to the urban centers for the year (1987), the derived figures were far from Mark Jefferson's values. According to Jefferson, the second city's population size should be (30%), while in the region, it was only (8.37%). The third city, according to Jefferson, should be (20%), but in reality, it was (6.62%). Table (1) provides more clarity on this matter. The results were significantly different from Jefferson's theoretical values, indicating an imbalance in the urban population hierarchy.

As for the situation in (2022), the second city's population size was (47.18%), exceeding Jefferson's value of (30%). Meanwhile, the third city in (2022) was closer to Jefferson's value of (20%), with an actual percentage of (23.27%). These results highlight the variations over the study period, with the actual figures in (2022) approaching Jefferson's values, while the (1987) figures were far from Jefferson's values. However, Constantine's dominance as the first city remained clear, as reflected in Table (1).

Table 1. Results of Mark Jefferson s Law application for the period (1987-2022)

Cities	Application of the first city law on urban centers of 1987		Cities	Application of the first city law on urban centers of 2022		Assumed rank according to Jefferson's law %
	Population	City size %		Population	City size %	
Constantine	440842	100	Constantine	466226	100	100
El khroub	36924	8,37	N ville Ali menjli	220000	47 ,18	30
Hamma bouzian	29203	6,62	ELkhroub	108520	23,27	20

Source: on data (0ns , dptb) for years(1987 ,2022)

To further confirm the characteristic of urban dominance, we applied Ziph's urban hierarchy relation to determine whether the urban system is characterized as single-headed, multi-headed, or consistent with Ziph's model.

The results indicated the presence of a top-heavy city. When the population of the first city was divided by the population of the second city in (1987), applying the relationship as stipulated by Ziph, the result was (12.13), which exceeds the value of (2). This indicates a significant imbalance in the urban hierarchy.

In (2022), the urban hierarchy value was estimated at (2.02), and the value was approximately equal to Ziph's value. This implies that there was hierarchy and organization in the urban network in (2022).

The results of the urban hierarchy during the study period (2) are further clarified in the table number.

Table 2. Results of Ziv s urban hierarchy, in the Constantine state regions for the period (1987-2022)

Cities	Status for the year 1987			Cities	Status for the year 2022		
	City size %	Result of urban hierarchy	Urban hierarchy according to Ziv		City size %	Result of urban hierarchy	Urban hierarchy according to Ziv
The first city (Constantine)	440842	11,13	2<	The first city (Constantine)	446236	2,02	=2
The second city (El Khroub)	36924			The second city (Nville Ali Menjli)	220000		

Source :on data (0ns , dptb) for years (1987,2022)

To understand the imbalances associated with the urban network of the Constantine urban region, we examined the distribution of the urban population across urban centers. To achieve this goal, we calculated the

Gini coefficient for the years (1987) and (2022) and constructed Lorenz curves. The study of Gini values for the study years revealed disparities in the distribution of urban populations among urban clusters.

The results are presented in Table (3), which highlights that there was no equity in the distribution of the urban population. The table shows that the Gini value in (1987) was (0.786), while in (2022) it decreased to (0.538). This indicates a rapid change in the dynamics of the urban system. The improvement in (2022) was confirmed by the emergence of the new city Ali Mendjeli and the mitigation of previous imbalances compared to (1987). In addition to the increase in urban centers, there was an improvement in the Gini values in (2022) compared to (1987).

Table 3. Results the Gini coefficient of urban system in the Constantine state region for period (1987-2022)

Year	1987	2022
Gini coefficient of urban system	0,786	0,538

Source: on data (0ns, dptb) for years (1987, 2022)

The construction of Lorenz curves for the years (1987–2022) and the analysis presented in Figure (3) and Tables (4) and (5) demonstrate a distribution far from ideal and also far from Lorenz's optimal line. The curve shows distortion and deviation from Lorenz's optimal line for both (1987) and (2022). However, the situation was worse in (1987), indicating improvement in (2022). This improvement aligns with the results of the Gini coefficient and Lorenz curve.

Table 4. Hierarchy urban centers according to the Ziv in the Constantine state region for year 1987

Year 1987											
Size categories	**Number of urban centers**	**(I) %**	**Rising cluster (2)**	**Population**	**(I) % (3)**	**Rising cluster (4)**	**Ni (I)**	**Si**	**S_{i-1}**	**(5) + (4)**	**((5) + (4)).(I)**
5000-10000	2	25	25	15105	2,7	2,7	25	2,7	0	2,7	67,5
1001-20000	3	37,5	62,5	38445	7	9.7	37,5	9,7	2.7	12,4	465
20001-50000	2	25	87,5	66127	11,8	21 ,5	25	21 ,5	9,7	31,2	780
50001-100000	-	-	87,5	-	-	21,5	0	21,5	21,5	43	0
100001-300000	-	-	87,5	-	-	21,5	0	21,5	21,5	43	0
300001+	1	12,5	100	440842	78,6	100	12,5	100	21,5	121,5	1518175
Total	8	100			100						2131,25

Source: on data (ons) for year 1987

Table 5. Hierarchy urban centers according to the Ziv in the Constantine state region for year 2022

Year 2022											
Size categories	**Number of urban centers**	**(I) %**	**Rising cluster (2)**	**Population**	**(I) % (3)**	**Rising cluster (4)**	**Ni (I)**	**Si**	**Si-1**	**(5) + (4)**	**((5) + (4)).(I)**
5000-10000	3	18,7	18,7	22402	2	2	18,7	2	0	2	37,4
1001-20000	2	12,5	31,2	29419	2,6	4,6	12,5	4,6	2	6,6	82,5
20001-50000	6	37,5	68,7	176979	15,7	20,3	37,5	20,3	4,6	24,9	933,75
50001-100000	2	12,5	81,2	105244	9,3	29,6	12,5	29,6	20,3	49,9	1477,04
100001-300000	2	12,5	93,7	328520	29	58,6	12,5	58,6	29,6	88,2	1102,5
300001+	1	6,2	100	466226	41	100	6,2	100	58,6	158,6	983,32
Total	16	100			100						4616,51

Source :on data (dptb) for year 2022

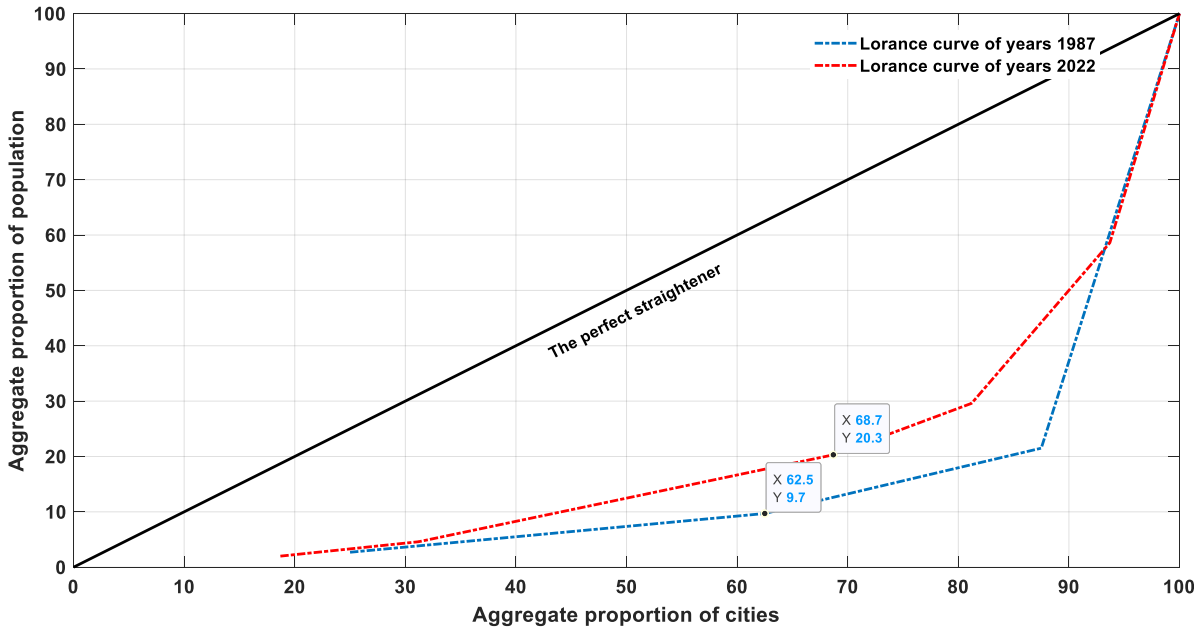

Fig. 3. Lorenz curve for urban centers in the Constantine state region for the period (1987-2022)
Source :on data (0ns , dptb) for years (1987,2022)

To achieve the research objectives and to identify the hierarchy of urban centers through Ziph's rule for the study years, we aimed to highlight the imbalances within the urban network of the Constantine region.

The following steps were undertaken:

- Ranking cities in descending order based on their population size.
- Calculating the inverse of the ranks according to Ziph's rule.
- Calculating the size rank of cities.
- Deriving the ideal sizes of cities by applying Ziph's rule.

Comparing Actual Size with Theoretical Size (Ziph) and Determining Surplus or Deficit in Population

Applying Ziph's rule in the research indicates negative differences across all cities, whether in (1987) or (2022). The results highlight the intensity of imbalances in the urban system during these years.

The situation in (2022) is more clarified in Tables (6) and (7) and Figure (4). The results confirm that the situation in (1987) tends to be more disorganized, especially in terms of the relationship between the theoretical rank size according to Ziph and the actual size rank of (2022). However, the urban network tends toward regularity in (2022).

Table 6. Hierarchy urban centers according to the Ziv in the Constantine state region for year 1987

Ranking	Cities	Actual population	Rank size	Rank according to Ziv	Theoretical of population	Deviation
1	Constantine	440842	-	-	-	-
2	Elkhroub	36924	0.083	0.5	220421	-183497
3	Hamma bouzian	29203	0.066	0.33	146947	-117744
4	Zighoud youcef	17416	0.039	0.25	110210	-92794
5	Ain smara	10558	0.023	0.2	88168	-77610
6	Ain abid	10471	0.023	0.16	73473	-63002
7	Didouche mourad	8839	0.020	0.14	62977	-54138
8	Ibn zid	6266	0.014	0.125	55105	-48839
Total	8					

Source :on data (0ns) for year 1987

Table7. Hierarchy urban centers according to the Ziv in the Constantine state region for year 2022

Ranking	Cities	Actual population	Rank by size	Rank according to Zev	Theoretical population	Deviation
1	Constantine	446226	-	-	-	-
2	Ali menjeli	220000	0.47	0.5	233113	-13113
3	lkhroub	108520	0.32	0.33	155409	-46889
4	Didouch mourad	54648	0.11	0.25	116557	-61909
5	Hamma bouzian	50596	0.10	0.20	93245	-42649
6	Ain smara	41847	0.08	0.16	77704	-35857
7	Ain abid	32211	0.07	0.14	66604	-34393
8	Zighoud youcef	32129	0.07	0.125	58278	-26149
9	Zouaghi	28000	0.06	0.11	51803	-23803
10	Bkira	22500	0.05	0.10	46623	-24123
11	Ibn badis	20292	0.04	0.09	42384	-22092
12	Ould rahmoune	16515	0.04	0.08	38852	-22337
13	Ibn zid	12904	0.03	0.08	35864	-22960
14	Salah derraji	8500	0.02	0.07	33302	-24802
15	Messaoud boudjeriou	7402	0.02	0.06	31082	-23680
16	Gurrah	6500	0.01	0.06	29139	-22639
total	16					

Source :on data (dptb) for year 2022

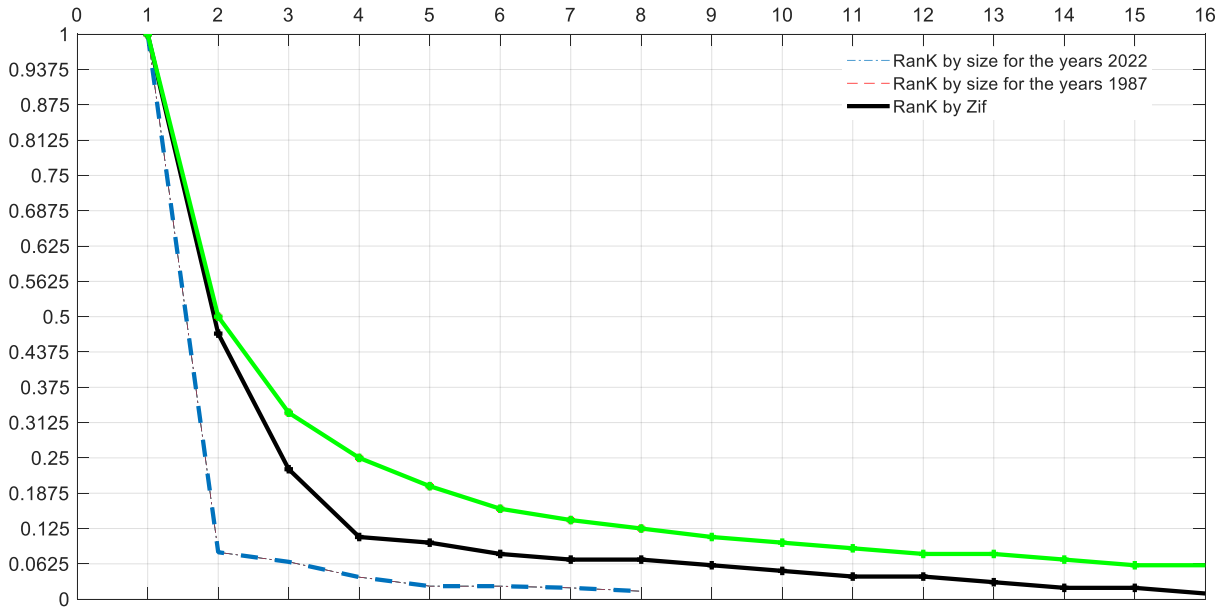

Fig. 4. Hirarchy urban centres according to the ziff rank in the Constantine stateregion for the period (1987-2022) Source: on data (0ns , dptb) for years (1987,2022)

To further analyze the characteristics of the urban system and reveal the distribution pattern of the urban centers under study in (1987) and (2022), the closest neighbor index (also known as the proximity index) was applied. The analysis was performed using the QGIS program. The results are presented in Table (8).

The closest neighbor analysis for (1987) showed that the distribution pattern of cities, as determined by the program, was (.1,631)' Any unorganized follow-up distribution The obtained results indicated a confidence level of (25%) with an error rate of (5%).

For (2022), the distribution pattern of urban centers determined by the program was (.1,257), Any non-uniform sequence distribution tends to converge with a confidence level of (95%) and an error rate of (5%).

Table 8. Result of application for the Relationship of Nearest Neighbor in the Constantine state region for period (1987-2022)

The Results of Application for the relationship of Nearest Neighbor		
The year	Average observed distance	Average Nearest Neighbor Index
1987 2022	1090562661830293 673170271460062	1.631 1.257

Source : on data (0ns, dptb) for years (1987,2022)

Conclusions.

In line with the study's objectives and our attempt to uncover the characteristics of the Constantine urban system for the period (1987–2022), the results showed clear urban characteristics with accelerated urban dynamics that brought significant changes to the urban system's features.

Overall, the findings reveal an improvement in urban characteristics, shifting from poor distribution and significant imbalances in (1987) to improved urban characteristics in (2022). The results associated with the applied indicators were positive, favoring the end of the study period.

The urban dominance of the primary city, Constantine, began to decline due to the emergence of the new city Ali Mendjeli. Many cities saw substantial growth in size, such as El Khroub, Ain Smara, and Ain Abid, among others.

The study results regarding urban dominance and imbalances showed that, when applying Jefferson's first city rule and measuring Ziph's urban hierarchy, Jefferson's results diverged from the actual urban system results. However, there was improvement in the situation by 2022.

As for Ziph's urban hierarchy, the primary city Constantine dominated the urban landscape in (1987). However, in (2022), the results aligned with the actual data obtained.

To analyze the hierarchy of urban centers, we applied the rank-size rule. The results revealed a lack of balance in the network, as all centers experienced a deficit throughout the period. However, at the level of center hierarchy, the centers showed regularity, and the rank-size curve almost matched Ziph's rank-size curve in (2022).

The situation was different and far from regularity in (1987).

The results of the study, based on the application of the Gini coefficient and the Lorenz curve, revealed a match between graphical data (Lorenz) and numerical data (Gini). The findings indicate that the phenomenon deviates from ideal conditions, highlighting imbalances between the number of clusters and population sizes. These imbalances were more pronounced in (1987) and less severe in (2022).

The results of applying the proximity index indicate a clustering tendency among centers, which was evident in (2022), in contrast to the random distribution observed in (1987).

The study results show variation between the two ends of the study period. In (1987), the phenomenon of urban polarization was prominent, with the dominance of the city of Constantine over the urban landscape. In (2022), there was a general improvement in the selected and adopted urban indicators used in the research. This improvement is primarily attributed to the emergence of the new city, Ali Mendjeli, which played a significant role in shaping a new urban reality, reducing dominance, and increasing regularity.

Based on the findings, it is essential to give developmental attention to small urban centers and assign them their designated economic role to create reverse polarization towards these areas. The results also emphasized the importance of spatial planning and urban design as tools to regulate unexpected urban developments and reduce disparities among cities.

Key Recommendations:

- Launch a developmental policy aimed at improving the urban system to restore balance to the regional system.

- The study highlighted the importance of new city policies in mitigating the phenomenon of urban polarization, which should be considered in future urban planning policies.

- Urban polarization results from migration movements from rural areas; therefore, redistribution of development to small centers is necessary.

- More work is needed in this field by developing quantitative indicators that closely reflect reality and prove to be more effective.

- The developments in the urban system are jointly reflected in the development of the national and local strategy within the scope of the study and this by the end of the period (Webb and all, 2023).

REFERENCES

1. Ciline, R, (2004) ,Tissus de villes.Reseaux et systemes urbains en Europe [Network cities and urban systems in Europe],Rapport de synthese, Universite paul valery Montpellier 3pp (193)
2. El Chamberi , N, (2017), Une vision géographique pour le développement du système urbain à Taiz, Faculty of Arts, Unniversite Taizp ,PP (1-31)
3. He,W,CHem ,M,2024 p2), Advancing Urban Life: A Systematic Review of Emerging
4. Technologies and Artificial Intelligence in Urban Design and Planning, Planning. Buildings 2024, 14, 835. https://doi.org/10.3390/ buildings14030835
5. Ali Abda, A,(2017) , Urban system network in Egypt during the period (1986-2017), Geographic research series 2021 ,Ussue 166.
6. Fraji, Kh, (2017), Urban dynamics and the dysfunction of cities case of city of laghouat, A thesis on city management, Universite constantine3, P (178).
7. (2006) Official Gazette, City Law No. 06/06/2006, n accordance with the Urban Planning Directive Law.
8. (1995) Algeria Tomorrow, Ministry of Equipment and Urban Planning,

9. (1987) Officie National des Statistiques (O.N.S), données statistique, [statistical data], est élaboré par la direction technique chargée des statistique
10. (2022) Direction de la programmation et du suivi budgétaire(dpsb) ,donnée statistique wilaya de constantine.
11. (2008) Algerian urban network, Completed by, Officie National des Statistiques (O.N.S).
12. Ali Ibrahim, A,(1999), Geostatistical methods, University Knowledge House, Faculty of Arts, Alexandria University, P (387)
13. Boukerzaza, H (1996) Maillage territorial et pouvoire dans l algerie du nord-Est,[Territorial network and power in northeastern Algeria],Publication du Laboratoire de geo graphie rurale de l universite paul valery p (231).
14. Webb and all, (2023), Enabling urban systems transformations: co-developing national and local strategies, Webb et al. Urban Transformations (2023) 5:5 https://doi.org/10.1186/s42854-023-00049-9