



## The Impact of Administrative Division and Reorganization on the Urban Network in Hodna Region (M'sila, Algeria), Spatial-Temporal Approach

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### Abstract

**Objectives:** This study aims to achieve two main objectives. The first one is determining the characteristics of the municipal network in the Hodna region and describing the most prominent spatial imbalances. The second is the impact of administrative divisions and regional reorganization processes on the spatial distribution and evolution of the population.

**Methods:** The approach adopted in determining the characteristics of the municipal network and evaluating the degree of spatial efficiency is the descriptive, analytical and measurement approach through the application of the shape index and the polygons of Thiessen. The analysis of variation in the spatial distribution of population and spatio-temporal dynamics according to administrative divisions was through the spatio-temporal approach.

**Results:** The results show that the municipalities shapes do not correspond to any spatial logic, as their forms are old and depend on the terrain or social factors. The reorganization of 1974 and 1984 contributed to the reinforcement of the capacities of province and the municipalities by equipping them with new urban functions and many agglomerations have been promoted to extended functions, where the capitals of districts and municipalities were turned from small urban centers to real cities.

**Conclusions:** The administrative division and reorganization of the territory has a significant impact on the urban network and the stability of the population. Therefore, the reorganization has given more finesse and flexibility to the management of the territories by providing them with various public services and administrations inherent to their respective ranks.

**Keywords:** Hodna, municipal network, spatial-temporal dynamics, administrative division, reorganization, urban network

### أثر التقسيم الإداري وإعادة التنظيم على الشبكة الحضرية بمنطقة الحضنة (المسيلة، الجزائر) مقاربة مكانية زمانية

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#### ملخص

**الأهداف:** تهدف هذه الدراسة إلى هدفين رئيسيين، أولهما تحديد خصائص الشبكة البلدية في منطقة الحضنة ووصف أبرز الاختلالات المجالية، ثانيهما تأثير التقسيمات الإدارية وعمليات إعادة التنظيم الإقليمية على التوزيع المجالي للسكان وتطورهم. **المنهجية:** اعتمدت الدراسة المنهج الوصفي التحليلي والقياس في تحديد خصائص الشبكة البلدية وتقييم درجة الكفاءة المجالية من خلال تطبيق مؤشر الشكل ومضلعات ثيسان، أما بالنسبة لتحليل التباين في التوزيع المجالي للسكان والدينامية الزمانية المكانية تبعا للتقسيمات والتنظيمات الإدارية فجري اعتماد المقاربة الزمانية المكانية.

**النتائج:** أظهرت النتائج أن أشكال البلديات لا تتوافق مع أي منطق مكاني، فأشكالها قديمة تعتمد على التضاريس أو العوامل الاجتماعية، وقد ساهمت عملية إعادة التنظيم الإقليمي لعامي 1974 و1984 في تعزيز قدرات الولاية والبلديات من خلال تجهيزها بوظائف حضرية جديدة، كما جرت ترقية العديد من التجمعات إلى وظائف موسعة؛ حيث تم انتقال عواصم الدوائر والبلديات من مراكز حضرية صغيرة إلى مدن حقيقية.

**الخلاصة:** إن التقسيم الإداري وإعادة التنظيم الإقليمي لهما تأثير كبير على الشبكة الحضرية واستقرار السكان، فعملية إعادة التنظيم الإداري لسنة 1984 أعطت مزيدا من الدقة والمرونة لإدارة المجال من خلال تزويدها بمختلف الخدمات والتجهيزات العمومية اللازمة لرتها ما شجع السكان على الاستقرار واستقطاب سكان المراكز الأقل تجهيزا.

**الكلمات الدالة:** الحضنة، الشبكة البلدية، الدينامية الزمانية المكانية، التقسيم الإداري، إعادة التنظيم، الشبكة الحضرية.

### **Introduction:**

Space corresponds to the projection of the ideological and social-economic foundations and society, the organization of space results from the work or the development that society produces to organize its life, the spatial-temporal evolution of the space is a synthesis of long historical periods where different spatial organizations have succeeded or clashed. This evolution can be linear and often continues with the aim of a better balance between man and the present conditions, as it can be discontinuous and whose resultant is a heterogeneous space, Algeria in general and the region of Hodna in particular corresponds to the second evolution which took place in a very differentiated geographical environment. The current configuration of the Hodna space is the result of a heavy heritage made up of a succession of deeply rooted contradictions and cuts, By intervening in space in the name of development and well-being, it produces homogeneous spatial forms, ensuring a balance, or contradictory, creating internal oppositions or discrepancies at the level of the system, Spatial planning appears as a persistent reorganization of space on a dialectical background, of equity between space and people as well as economy for the well-being of society, in short, a perpetual struggle against regional disparities.

As any space to be developed is perceived in a negative, "poorly balanced" way, the objective of development is to correct the spatial effects of human activities (Baud, Bourgeat, & Bras, 1997), Regional analysis is a very delicate investigation because the region is a construction of a very complex set of invariants and factors, visible or invisible, mobile or inert, in continuous and interdependent relationship, which are difficult to apprehend. completely and simultaneously, It is however essential to highlight the major aspects of the regional organization according to the parameters taken into consideration, and to detect the discrepancies and gaps between the different spatial subsets that compose it, In this spirit, the analysis of the administrative network makes it possible to widen the field of investigation on the organization of space, it refers to the exercise of power and to a function of supervision of the social project, the optimization of the division of the territory is at the heart of planning concerns.

Algeria has undergone, and is in the process of undergoing, very accelerated territorial transformations following historical, economic or political imperatives (Raham, 2001). Before independence, the various territorial reorganizations, which Algeria had known, obeyed various requirements; whether they are colonial in nature or respond to expansionist imperatives, they have often aimed at the disproportionate exploitation of the country in all areas, In the aftermath of independence, the public authorities multiplied their efforts in order to put an end to the multiple disparities emanating from the previous political and economic systems. It is a task that seems difficult if one knows "the topographic fragmentation of the country", "the heterogeneity of the population in this segmented space", "the topographic fragmentation of the country and the segmentary character of Algerian society" (Cote, 1993). It therefore seems imperative to relate the different territorial reorganizations of the Algerian space to better understand the current network "Referring to this completely disrupted history means trying to better understand the present in order to better guide future planning and territorial division actions" (Amari, 1982). Because of its complexity, the province of M'sila constitutes for the regional analysis a privileged field of observation, without corresponding to the uniform Christallerian space, this region constitutes an interesting field of investigation for the research on the principles of Spatial organization, Population densities are very unequal, the mountain ranges are more populated than the plains, and the North more than the South.

However, for several decades, there has been population migration from the mountainous areas to the plains and to the large urban centers (M'sila, Bousaada, Sidi Aissa, Ain Lahdjet and Magra), which has led to a significant change in the spatial distribution of the population, this trend modifies the configuration of space and leads to imagine a territorial reorganization.

### **Objectives of the study:**

Little research efforts have been allocated for the administrative divisions and the different territorial reorganizations of the Algerian space to better understand the current network, This study aims to shed light on the principles of the administrative division of Algeria in general and Hodna region in particular, and to characterize its main imbalances, in particular by identifying marginalized areas, and its impact on The Urban Framework and population distribution in the space (The spatial-temporal evolution).

### **Questions to address:**

Algeria inherited a space modelled by the very inadequate colonial order, it is a space characterized by deep regional imbalances (Raham, 2001). In addition to a segmented natural environment, the composite and disarticulated Algerian space where there remain profound imbalances and pathological urbanization, The current study examines the impact of administrative division and reorganization in Algeria at the population distribution in Hodna.

Therefore, this study deals with similarities and differences in the communal meshes in Hodna region in Algeria and their impact on the urban framework, and seeks to answer on the questions below:

Is the spatial-temporal dynamic of the population concentrated at the level of polarized regions where agglomerations are promoted or is it the beginnings of a spatial rebalancing?

Although many efforts have been made in recent decades, is this municipal network better organized in space or does it continue to experience rather unequal and marginalized regions? It is now more than necessary to see if the desired homogeneity has been achieved or if it is in the process of being put in place? Regarding spatial analogies, are these the fruit of a logic specific to space or are they the fruit of other parameters?

### **Significance of the Study:**

The importance of this study is to address the topic of spatial organization has been, and still is, one of the most important topics for researchers, The spatial-temporal evolution of space is a synthesis of long historical periods (Raham, 2001), It is through the municipal administrative meshes and the evolution of the urban network of the province of M'sila we have tried to give this space an appropriate image of its current configuration, in order to better predict its future, Hodna region began to experience real administrative organizations built on functional spatial divisions whose major concerns seem to be decentralization and homogenization and the expected goal was often a better regional balance and further decentralization.

### **Source And Method:**

This study is based on the exploitation of the available demographic data of the municipalities of the region, The number of inhabitants is an excellent synthetic indicator of the position of the municipal mesh within an urban network, presents a largely demonstrated theoretical interest, It allows to highlight the mechanisms of growth and configuration of the urban network (and more generally of the distribution of population in space) through administrative divisions and reorganizations, Population figures also have an advantage which turns out to be capital in a country like Algeria (or a region like Hodna which until now presents virgin territory for researchers) thanks to the censuses carried out more particularly the last five (1966, 1977, 1987, 1998 and 2008).

The approach used is the inductive approach "It is an approach whose specific expression, in addition to the detailed description, is the map, a means of representing all the observable data, whether it relates to the physical environment, to the population and its uses of space, agricultural, urban, industrial, commercial and the flows that link these spaces together" (Bailly & Beguin, 1982), which is based on analytical observation, classification and cartography and finally the explanation of the distribution of spatial facts is based on the detailed observation of reality.

### **Some trends in administrative division**

Administrative divisions constitute an important element of state governance and a basis for the redistribution of state power and policy formulation, and their rationality has a major impact on regional development (Ma & Zhang, 2009). The different levels of administrative units in the administrative division system are called administrative regions or administrative districts.

Existing interpretative research on the impact of creating or adjusting administrative divisions on urbanization is relatively fragmented: the first is the change in the geographic space of an administrative region. Research shows that adjusting administrative divisions guides local development by effectively integrating regional resources (Yu, Lu, & Cao, 2006), expanding new urban growth spaces, increasing population and size of industries under jurisdiction (Shang, Lu, &

Zhang, 2015) and the optimization of urban spatial structures (Wang, Wang, Hong, et al., 2015). The adjustment of administrative divisions also coordinates administrative divisions with natural divisions, urban system divisions, transportation network models, main function zoning and population distribution, thereby effectively promoting local economic and social development (Yang et al., 2013). The second perspective is the change of the administrative system. Administrative levels, barriers between regions, central-local relations, cities leading county division, and other factors associated with administrative division all affect the methods and effects of regional spatial governance (Liu et al., 2014).

#### ***Mesh of the European territory.***

Dexia (2012) summarizes some models of implementation of territorial reform in different countries, at the center of which is the need and the tendency to reduce the number of small municipalities (depending on space and population), or to their removal by merger. with other municipalities or urban centers on the basis of different reform criteria, Territorial reform is different from one country to another, the number of municipalities in Greece decreased from 1034 in 2007 to 324 in 2011, in Saxony decreased from 840 in 2007 to 220 in 2011, the number of municipalities in Germany decreased from 12,456 in 2007 to 11,553 in 2011. In Finland, the number of municipalities increased from 431 in 2006 to 336 in 2011, and in Denmark in 2007, the number of municipalities increased from 271 to 98, In 2011, in order to have more stable management of urban systems, the Irish government promoted the union of cities and towns, Furthermore, in 2012, the Spanish government adapted a plan that aimed to reduce the number of localities with less than 5,000 inhabitants, which made 84% of the total number of municipalities throughout the country, under these conditions it aims to at the same time to regulate local rights and skills. However, this trend is not observed in all European countries. Thus, in France and Luxembourg, this trend is developing slowly. In Italy, the reform based on the suppression of small municipalities of less than 1000 inhabitants was contested, the need to implement such a territorial reform was replaced by the alternative of implementing policies of merging these municipalities into interjurisdictional cooperation.

#### ***Mesh of the Brazilian territory***

The political and administrative network of Brazil was formed by obeying three principles and mechanisms: freedom, division and inequality, Freedom first, the principle has always been that new units can be formed at the request of the inhabitants, when they reach a minimum population and in compliance with legal rules. This is how municipalities have appeared over the years and new states have been formed over the centuries (Mato Grosso do Sul in 1979, Tocantins in 1988 to take the last), Division then since the new units are formed by dismemberment of the old ones, Thus, when a new agglomeration is formed and develops, it becomes unbearable for its inhabitants to go to the municipality on which they depend for their various administrative procedures, Their demand for autonomy has every chance of succeeding one day or another. another if their demographic dynamism is confirmed. The inequality of political and economic weight, of surface area, arises naturally from the first two mechanisms.

#### ***Mesh of the Chinese territory***

In China's administrative division system, the population size, resources and scale of industry under an area's jurisdiction, as well as the level and authority of an administrative region, determine whether its position in regional development is favorable (Liu, 2006). Fan et al. (2012) used county (and city) panel data and the difference-in-difference (or "double-difference") method to discover that the policy of redesignating counties as cities did not promote urbanization and economic growth. An important reason was that the cities created by the policy were too small to form agglomeration effects, Tang et al. (2015) expanded the scope of their sample and found that the reform to turn counties into municipal districts significantly increased the population growth rates of cities and municipal districts. This change is mainly attributed to the influxes of people from counties (and municipal districts) and from other provinces. Cities in eastern China and cities with greater potential markets had more distinct population agglomeration effects, The territory is organized into provinces, autonomous regions and municipalities placed directly under the authority of the central government. There are currently 31, 22 provinces (Anhui, Fujian, Gansu, Guangdong, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan and Zhejiang), 5 autonomous regions (Guangxi, Nei Mongol, Ningxia, Xinjiang and Xizang), 4 municipalities (Beijing, Chongqing, Shanghai and

Tianjin). Since the reforms of 1983-1984, the provinces have tended to be subdivided into municipalities which are medium or large towns with rural districts.

Improving the fiscal decentralization system, especially in backward areas, can increase overall efficiency of investment in public goods (Shen & Fu, 2007). Moreover, administrative levels are closely related to urban development. The central government provides greater support to cities with higher administrative levels, such as preferential allocations of various resources and access to more public resources, which stimulates population and industry agglomeration, and promote urban development (Henderson, Quigley, & Lim, (2007); Cai, Zhang, & Deng, (2011)).

#### **Administrative divisions and reorganizations territorial in Algeria: (historical brief)**

The spatial-temporal evolution of the Algerian space is a synthesis of long historical periods where different spatial organizations succeeded or clashed, Algeria in general corresponds to the discontinuous evolution whose result is a heterogeneous space which is accomplished in a very differentiated geographical environment. The current configuration of the Algerian space is the result of a heavy heritage consisting of a succession of deeply rooted cuts and contradictions.

the Ottoman Regency marked the first stage of a permanent spatial division which structured the territory well beyond the temporality of this organization, "The weakness of the central power held by the representatives of the Turkish Sultan had allowed the pre-existing tribal network based on a close relationship, ethnically based, between the social organization and the living space of the tribes" (Hamani, 1985). The life of the tribe was intimately linked to its territory, which was both its political space and its main economic resource. The borders between the tribes were not materialized in space but admitted by tacit and mutual recognition. During this historical period, made by chance or made intentionally.

Despite significant internal political fluctuations, the Regency, which lasted a little over three centuries, was the bearer of major changes of two kinds. On the one hand, the Regency constituted a centralized state through a process of territorial unification (Côte, 1988), and on the other hand, it established a tripartite division of the territory based on a new administrative entity "the Beylik". The Regency thus had three Beyliks, placed under the authority of the beys, to which was added a fourth entity corresponding to the city of Algiers and its neighboring region, Dar-sultan, under the direct authority of the Dey. the partition of space into three provinces or Beyliks, the Beylik of the Levant for the East with Constantine as its capital, the Beylik of Titteri for the central part with the capital Medea and the Beylik of the Ponant corresponding to western Algeria with Oran capital on the coast, was based on the principle of complementarity of the territories: "it is a singularity of history that Algeria, naturally divided into three zones parallel to the sea, found itself divided into three perpendicular regions to the coast" (Larcher & Rectanwald, 1923). If this division was innovative, in that it politically restructured the structure of the territory, it is nevertheless possible to underline a certain continuity with the previous periods, as highlighted (Côte, 1988). "The Turkish system, which had functioned for centuries, had sufficient strength and spatial reality for colonization to preserve it: it transposed it into the three departments of Constantine, Algiers and Oran, which continued a century" (Côte, Approach to Regionalization in Algeria, 1995).

The French colonial administration had developed a binary political system whose foundation rested on a social and spatial distinction. The result was an administrative dichotomy of a political and colonial order: it was a question of integrating and developing spaces occupying the best land for the European population and of confining the indigenous population to the poorer sectors. The subdivision of each of the three departments into "civil" territories (privileged by the population of European origin), "mixed", "Arab" or "military" (which had gradually disappeared in favor of civilian territories), had created and then maintained the process of disintegration of the tribes and the tribal system and a certain dissociation of the regional metropolises and their southern hinterland. Towards the end of the colonial era, the population having doubled and the economy having become more complex, management required a multiplied administrative organization. In 1956, the number of departments was multiplied by five, a single statute governing all the municipalities. This densification of the network was accompanied by a vast program of economic and social expansion (Plan of Constantine of 1958).

The constitution of Algeria establishes that the Algerian territorial units are composed of two levels: the municipalities and the provinces, Since the independence of Algeria, the intervention on the territorial network was part of a situation

where the control of the territory took precedence over spatial logic: “as soon as independence was acquired, one of the major concerns of each of the Maghreb States was to establish its authority and strengthen control of its territory” (Troin, 1985). In the aftermath of independence, several official texts define and govern the composition, territorial limits, consistency, organization and functioning of Algerian municipalities and provinces. In 2015 the state also created the delegated province, attached to a parent province, the Algerian regions are only geographical or cultural landmarks without legal existence, and the districts are only administrative entities.

The first reorganization of the municipalities 1963 - 1965, The Algerian State reorganized the municipalities resulting from the period of French colonization. It maintained the division of Algeria into fifteen departments and gives the distribution of Algerian municipalities by department and by district and brings the number of municipalities in 1965 to 676, distributed in 91 districts, for a population of 10,281,050 inhabitants. 1974: First territorial redistricting and reorganization of provinces and municipalities. The reorganization is done by the creation of eighteen new provinces and the abolition of two provinces, by attachment or detachment of municipalities between two or more provinces. He also reorganized the composition of the districts. The administrative reforms of 1974 and 1984 sought to reduce the regional disparities inherited from the macro-regional system of the colonial period. The logic of the new territorial partition aimed at homogenizing the administrative framework: promoting more comparable provinces in size and applying a single grid of equipment. This resulted in a significant increase in the number of constituencies and a reduction in the size of the grids, including the municipal grid. Behind this objective one could also read the political and ideological intentions of the Algerian state. An intermediate level has also been introduced: that of the district. The division of the Algerian territory into three levels, province, district and municipality, nested and hierarchical, tends to hide and reduce regional and local particularities. Miniaturization and atomization of the administrative territory mark the administrative organization of the country. The level of the "region" does not exist, the 48 provinces are attached, without intermediary, to the unitary State. Although the negative effect of the absence of the regional level on planning is recognized by the State, it has not been institutionalized, neither administratively nor politically, "as a result of the old fear of power with regard to regionalisms. The problem of a regional level remains posed for the future" (Cote, Approach to Regionalization in Algeria, 1995). The last reorganization of the provinces and the delegated provinces of 2015 and 2019 or the delegated provinces which existed only in the province of Algiers have been extended to the whole territory of Algeria since May 31, 2015, these constituencies are especially created in the South. The territorial reorganization of the country of 2019, it redivides the country into 58 provinces, 44 delegated provinces and 1541 municipalities, The delegated provinces of the Sahara created in 2015 are transformed into full-fledged provinces and 44 new delegated provinces are created mainly in the High plateaus.

#### **Study area:**

The province of M'sila, within its current limits, occupies a privileged position in the central part of northern Algeria as a whole, it is part of the region of the central highlands and covers an area of 18,175 km<sup>2</sup>. Its geographical position means that its main vocation remains agro-pastoralism dependent on unfortunately low and irregular rainfall not exceeding 250 mm per year. It is limited to the North East by the provinces of Bordj Bou-Arredj and Setif, to the northwest by the provinces of Medea and Bouira, to the east by the province of Batna, to the west by the province of Djelfa, to the south-east by the province of Biskra (Figure 1). The territory of M'sila constitutes a hinge and transition zone between the two great mountain ranges that are the Tell Atlas and the Saharan Atlas. The geographical configuration is a mountain zone on either side of the Chott Hodna and a central zone consisting mainly of plains and high plains. The total population of the province is estimated at 1,281,000 inhabitants in 2017, against 1,387,158 inhabitants in 2022, with an absolute increase of approximately 106,158 inhabitants, and a rate increase of around 2.04%, the density is 60 inhabitants/km<sup>2</sup>.



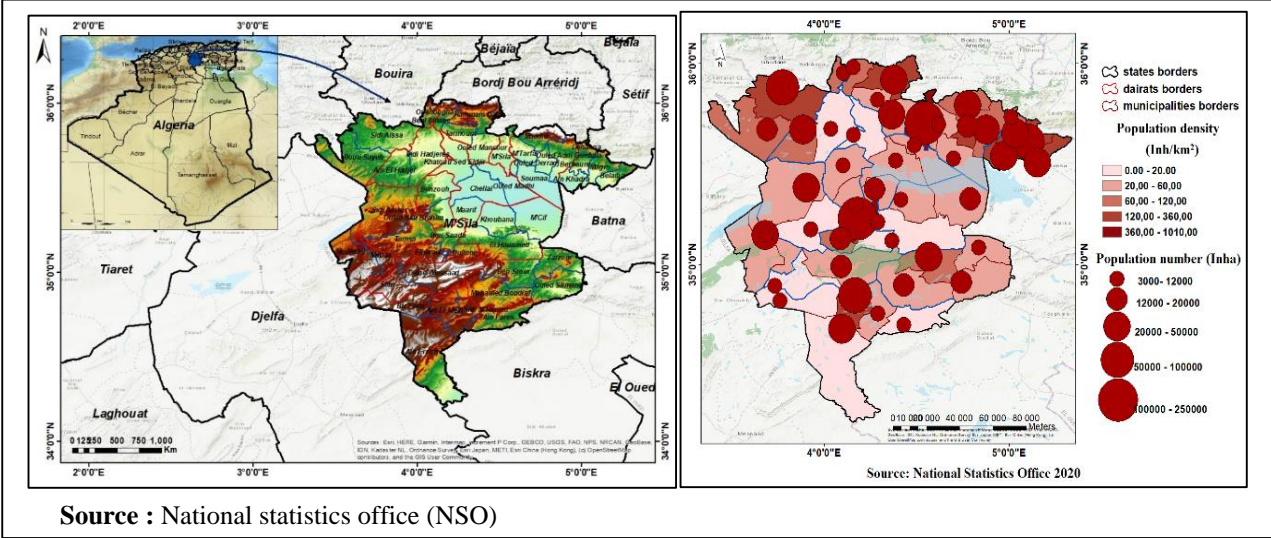


Figure 1: Geographical Situation of M'sila Province and the population number

Administratively, these are the most deprived shreds of province Mothers (Setif, Batna, Media) which be grouped together to form the province of M'sila in 1974, Originally composed of 23 municipalities, it now has 47 municipalities, grouped into 15 districts.

Table 1. The evolution of administrative division in Algeria and M'sila province

Year	Municipalities	
	Algeria	M'sila
1974	704	23
1984	1540	47
2022	1540	47

Source: National statistics office (NSO)

Many small and medium-sized towns have been promoted to extended management functions, M'sila, promoted to the rank of chief town of province, had 19,675 inhabitants in 1966 with an urbanization rate of 55.62%, For the capitals of district and municipalities, and therefore for a considerable number of small and medium-sized towns, it is a question of raising villages or small urban centers to the rank of real towns. Some centers such as Ouled Derradj, Magra, Barhoum and Ouled Adi Legbala, had less than 500 inhabitants.

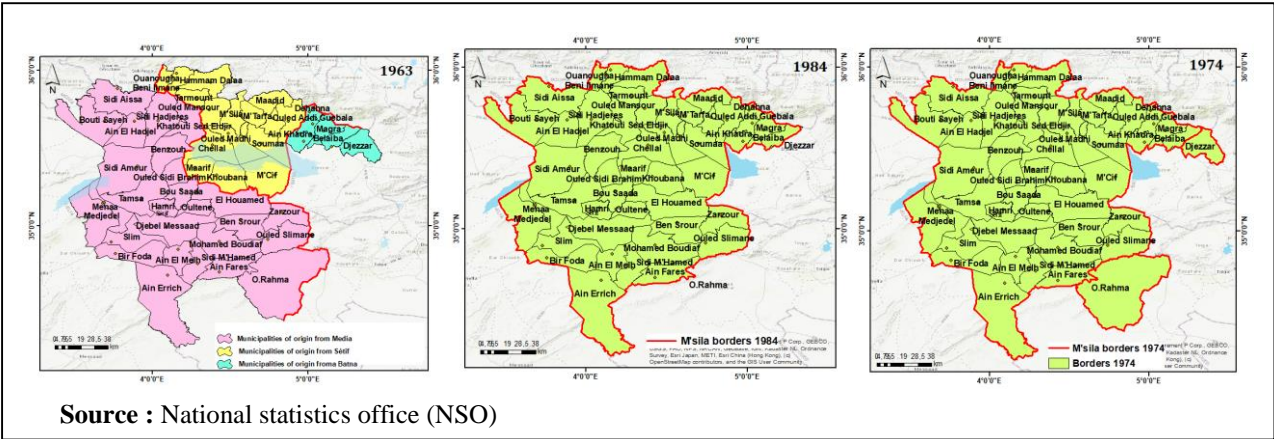


Figure 2: The administrative reorganizations of M'sila province

This reorganization, undertaken in 1974 and 1984, contributes to the reinforcement of the powers of the provinces and the municipalities, by endowing them with new urban functions, So this administrative promotion gave more finesse and flexibility to the management of the territories by allowing them to acquire various public services and administrations inherent in their respective ranks, In our region, there are ten promotions to the rank of chief town of district, These are Magra, Bousaada, Khoubana, O.Sidi brahim, S.ameur, S.Aissa, Ain el hadjel, Ben Srour, Ain el Melh, Medjedel, which were simple chief towns of municipalities, add to that the city of M'sila, chief town of the province, This proactive reorganization of the urban framework induces the creation new facilities and services (technical, educational, sanitary), support for the extension of urban functions, But the establishment of these administrative facilities does not have a considerable impact on the old urban landscapes, because they are localized generally settle in the outlying districts.

#### **Main economic indicators of industrial establishments in the province by major sectors**

Economically, The Province of M'sila is a Province with an agro-pastoral vocation and this thanks to the importance of its courses, The territory of the province extends over a total area of 1,817,500 ha distributed as follows: useful agricultural area is of the order of 277,592 ha or 15.27% of the territory of the Province, The rangelands and pastures occupy an area of 1,029,564 ha or 62.52% of the total agricultural area, The forests and halfa cover a area of 412,124 ha or 22% of the territory of the Province, Finally, unproductive land with 170,610 ha makes up 9.39% of the total area, The irrigated area is 41,340 ha (14.89% only of the S.A.U.) of which the majority from groundwater, The plant production of the province is varied (cereals, market gardening, arboriculture, fodder, etc.), and animal production (red meats, white meats, eggs, honey, wool, etc.).

The Industrial Fabric of the Province presents the paradox of being sparse while being composed of units of national strategic importance, a M'sila crude oil pumping station (SP3) which pumps oil from the deposits from the South, and sends it back to that of Beni Mansour to be transported to the port of Bejaïa (export) and to the refinery of Algiers, a thermal power plant for the production of electrical energy in M'sila (Drâa El Hadja) with a capacity of 880 Megawatts, which makes it the most powerful of its kind on the continent, a Sonelgaz central maintenance workshop in M'sila-Drâa El Hadja, has one of the three most powerful towers in the world and various workshops where work is carried out ranging from high-precision mechanics through special alloys to the repair of heavy machinery (giant power transformers - cement plant equipment, etc.), a maintenance and logistics unit operated by COSIDER in M'sila - Drâa El Hadja with an engine test bench comparable to that of Oued Hammimine, a LAVARGE (EX .ACC) cement manufacturing plant in Hammam dalaa, a HODNA dairy located in an industrial zone of M'sila, an Extrusion, Anodizing - Aluminum overhaul unit (ALGAL PLUS) unique in Algeria, gas barreling centers owned by NAFTAL located in the industrial zones of M'sila and Boussaada, a complex of Industrial fabrics of M'sila, and the largest in the country and part of whose production was export-oriented (TENDAL), two production units of eriad which produce daily 2,000 quintals of bread flour and 6,000 quintals of semolina . ENERGY In terms of electrification, the Province occupies an enviable place with a rate exceeding 96.98%, and the rate of connection to the natural gas network is 60.02%, although the gas pipeline crosses the Province right through, The fuel supply is done by a fleet of trucks from Bouira and Bordj Bou-Arredj, it should be noted that the pipeline supplying the Algiers refinery and used to transport crude oil to Bejaia (export) passed through the Province, In terms of reception infrastructure for industry, there are currently 02 industrial zones (M'sila and Draâ El Hadja for a total area of 241.08 ha, which are waiting to receive future units as part of the private investment.

**Table 2. Public industrial units and private industrial companies in the wilaya of M'sila:**

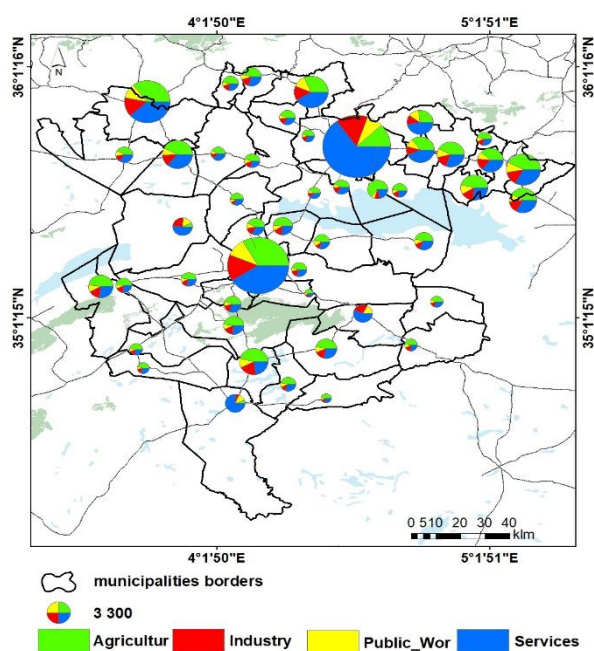
	<b>Companies</b>	<b>Address</b>	<b>Main activity</b>	<b>Number of employees</b>
Public	TINDAL	M'sila industrial zone	Manufacturing of industrial canvases	579
	ERIAD	M'sila industrial zone	Manufacturing of semolina and flour	7861
	Total	02	02	8440
Private	Hodna milk	M'sila industrial zone	Production of milk and derivatives.	813



Companies	Address	Main activity	Number of employees
ALGALPLUS	M'sila industrial zone	- Aluminum - Extrusion	328
SPA LAFARGE Ciment M'sila (LCM)	Hammam Dala	Manufacturing of cements	486
SARL MAGHREB PIPE Industries	M'sila industrial zone	Chemistry Rubber Plastic	516
SARL TOUAB	Municipality of Elhamel, Bousaada	Plater	345
SARL Algerian Faiencerics of M'sila	M'sila Activity Zone	Production of ceramic tiles	262
EURL the brothers Hellal Dates	01/03 road to Biskra, Bousaada	Dates processing and transformation	387
SARL EOAT	New urban area of M'sila	Public works and construction	260
SARL GRAND WORKS ROADS AND Hydraulics G T R H O	New urban area of M'sila	Public works and construction	301
Total	09		3698

**Source :** Monography of M'Sila province 31/12/2022.

The total population of the province is estimated at 1,387,158 inhabitants as of 12/31/2022 compared to 983,513 inhabitants in 2008, an absolute increase of approximately 403,645 inhabitants. The population density is 76 inhabitants per km<sup>2</sup>, with large variations between the communes (1,098 inhabitants per km<sup>2</sup> in the commune of M'sila, 699 inhabitants per km<sup>2</sup> in the commune of Bou Saâda, 06 inhabitants per km<sup>2</sup> in the commune of El Houamed), 401,921 inhabitants of the province are occupied by several sectors of activity (Figure 03).



**Source:** Monography of M'Sila province 31/12/2022

**Figure 3: Distribution of the employed population by sector of activity**

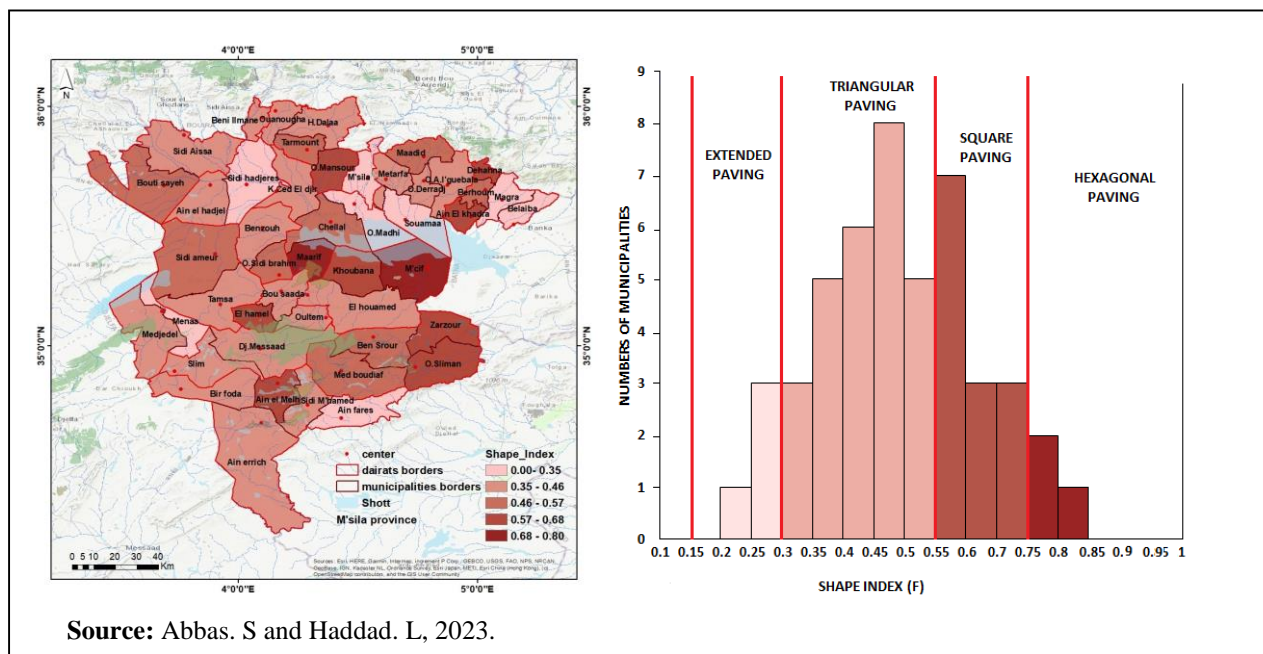
The tourism sector, given the concerns that prevailed a few years ago and some of which are still topical, has not been given the attention that would have been given to it, Hotel Infrastructures (Hotels classified: 02 Number of beds: 338 beds, Unclassified hotels: 05 Number of beds: 364 beds, Number of travel agencies: 16 agencies).

The province has certain natural, thermal and cultural sites that would allow the promotion of local tourism: historical (the Kalâa of Ben Hammad, Roman ruins), cultural (rock engravings, Nace Eddine DINET Museum and the Hodna Museum), natural (picturesque sites, forests - sand dunes - chotts - oases - thermal waters), The tourist development of the province is programmed through the ZET zones (tourist expansion zones), 03 zones for the communes M'sila, bou saada and maadid, Moreover 03 tourism investment projects registered.

#### **The measurement and analysis of the municipal network of M'sila province:**

##### ***The shapes of the municipal network (The shape index and):***

The 47 municipalities of the province of M'sila are characterized by indices whose very average values vary from 0.2151 for the municipality of Menaa to 0.8025 for the municipality of M'cif. The average is 0.4594 and the median is 0.4440 for a standard deviation of 0.1292, This bringing together of the index values of the municipalities of the average of the region and the median implies a strong concentration of the units towards the triangular mesh, this tendency is confirmed by the small value of the standard deviation, All of these forms could be classified into three distinct groups, A first group is made up of twelve units whose index is greater than 0.53 and whose shape is close to that of a square, These municipalities have only a few points in common: those of Dehahna is the smallest area of the province and the municipality of Maarif, M'cif, M.Boudhiaf., The second group is located around the average of the region (triangular shape), it corresponds to mountainous municipalities such as hammam Dalaa, Ouannougha and Djebel Messaad or at the depression of Hodna like Chellal, The last group includes fourteen units whose scores are low because of their very elongated shapes, Menaa extends from the northwest to the southeast is an exception by its shape narrow entrance you in the middle and the capital of the province M'sila that poses a longitudinal shape extends along the K'sob valley Until the depression of Hodna, the three largest units their shapes stretch, either latitudinal (Lahoumed) parallel to the massive Jebel Messaad of the Ouled nail of the Saharan Atlas, and longitudinal of the southern piedmont of the Tell Atlas (S.hajras and K.S.Eljir).



**Figure 4: the shape index of municipalities**

The positions of the chief towns of the municipalities in relation to their respective territories also bring out many disparities. The largest municipalities have eccentric chief towns: Ain errich, Lahouamed, S.Aissa, Ounnougha, Maadid and Belaiba in the side southern Tell is in the same situation. In the Plain of Hodma, the main towns are more central, such as Chellel, M'cif, Maarif, Magra, S.Hadjres...

The explanatory elements of such a variety of forms can sometimes be drawn from the configuration of the natural environment, sometimes from history and society. The interior municipalities and whose majority of the territory is in the Plain of Hodna, have the highest index values because of the ease of the topographic conditions, The municipalities located in the southern part have the lowest indices, some municipalities also have very elongated shapes, straddling the steppe region and the mountains of O. Nail.

The units that extend longitudinally correspond to the territories of the ancient tribes of the region where the practice of complementarity of terroirs is ancestral and possible thanks to the use of several geographical environments located at different latitudes such as Souamaa O.Madhi and O. derradj, All forms and all values exist and change according to the topography. The shapes of the municipalities fit together tightly in the North and become more and more loose towards the South where they take on stretched shapes. They correspond to population densities which also decrease from north to south. The triangular tiling is confirmed for the local level.

The modal class is that which has the form indices of the municipalities between 0.30 and 0.55 and corresponds to the triangular tiling. Of the 47 municipalities, 36.17% correspond to the triangular paving, 29.76% illustrate the very elongated paving, 27.66% of the municipalities are distinguished by square shapes and 6.38% represent the paving approaching the hexagonal shape (Figure 3), We are very far from the hexagonal paving. The municipalities which have high values do not have common points on the geographical level.

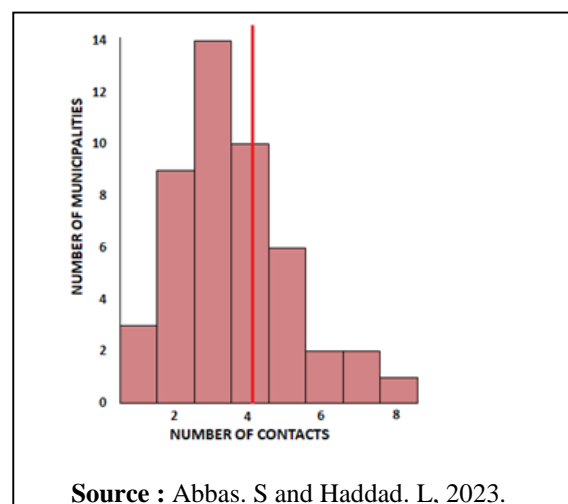
Among them we denote the municipality of M'cif (0.80), Maarif (0.72), Ain Elmelh (0.68), The smallest value, which is 0.22, corresponds to the municipality of Menaa whose the surface is 242.85 km<sup>2</sup> and has a very stretched shape in the northwest-southeast direction and And the capital of M'sila province, which extends longitudinally from north to south according to the direction of K'sob Valley, with a shape index of 0.25 , The modal value, 0.4805, reaffirms the strong concentration of the triangular tiling.

#### ***The number of contacts of municipalities of M'sila province:***

The spatial distribution of the indices has no geographical significance for the region as a whole: it is explained either by the topography in certain cases, or by the organization of space in others (Figure 3), Indeed, the municipalities whose shape often follows the shape of the elongated valleys in all direction to the north the valleys flow into Chott Hodna. have fairly low index values. It is in this case the natural factor which determines the administrative form of the district. This particularity is also found at the level of the southern part of the province which is typical of it; the majority of municipalities mainly correspond to triangular paving and then to elongated shapes. This is the form of the territory which is determined by the organization of the space, and which is based on the complementarity of the terroirs. This is another logic where the sociological or economic parameters take precedence over the factors of centrality and accessibility. We are faced with an example where the efficiency is inversely proportional to the aspect ratio. These forms are also typical of the intermediate band lying between the fairly developed north and certain northern slopes of the Saharan Atlas.

The analysis of the forms of the administrative fields could be completed by the application of another very simple method whose purpose is to verify the relationship with the hexagonal model. This method consists of counting the number of contacts or adjoining areas between any territory and the territories adjacent to it.

In a regular hexagonal system, the number of contacts would normally be 06 knowing that each administrative unit would have six neighboring units. It is preferable to eliminate the municipalities which are limited by borders with other provinces because they have truncated fields and consequently diminished on one or more sides compared to the districts of the interior regions.



**Figure 5: Contact Histogram of the municipalities of M'sila province**

In the case of the province of M'sila, one municipality out of three has between five and six neighbors, the average number is 4,553 contacts, the modal class is 5 contacts whose relative frequency is more than 21% of the commons; the number of 6 contacts also has a good frequency of 13%. This trend specific to the province of M'sila does not mean that the pentagonal shape or the hexagonal shape are the dominant shapes knowing that by using the shape index, the triangular paving characterizes 36% of the municipalities. This new appreciation of the form of the fields only shows that it is a grid dominated by the triangular tiling from the point of view of value but under the irregular polygonal form from the point of view of the form of the field. The predominance of 5 to 6 contacts is quite frequent and any form of administrative surface can only be contiguous if it is close to three other surfaces. On the other hand, it is good to know that each time the surface of the constituency increases, the number of contacts increases. The number of contacts is not always revealing of the form but can be indicative in the case where the paving is regular and where the administrative division is based on the functional forms in the spatial sense.

The application of the measurement of the forms of administrative fields led to the conclusion that the administrative grid of the region is dominated by the triangular paving and that the form of the field may depend on the topography or other social factors. The aim of this analysis was to manage to quantify or qualify the forms of administrative fields in order to determine spatial differences. In order not to remain dependent on a single theory, we will try to analyse the administrative division by using an empirical model based on Thiessen polygons.

#### ***Les polygones de Thiessen ou la théorie de l'énergie minimum:***

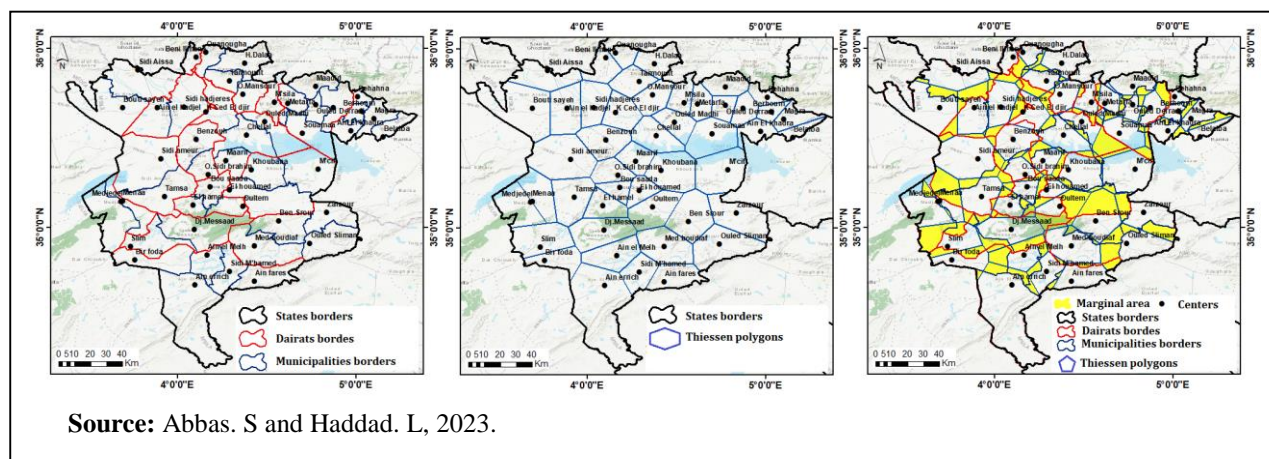
the municipalities of M'sila, remarkably, agree fairly well with the theoretical tiling and contradict the low scores of their shape indices although they have elongated shapes. This is due to the fact that there are no important centers to the south, which could create spatial rivalry with the main capitals, the polygons of Thiessen can show the imperfections or correspondences that exist in an administrative division. the province of M'sila has boundaries that fit well with the model, M'sila is poorly located in relation to its territory while Bousaada seems better placed for a possible promotion to command the southern half of the province of M'sila.

In reality, any division must proceed from a compromise between the two levels (local and regional) and the polygons of Thiessen make it possible, at least, to constitute a reference for measuring the gap in relation to the objectives set.

At the local level, the polygons of Thiessen, which are based on the principles of accessibility and equidistance, make it possible to identify the discrepancies of the territories in relation to their chief towns; it is a question of delimiting the areas likely to be reassigned towards other chief towns or for new creations within the framework of any administrative redefinition.

They also identify concordances as well as eccentric spaces in relation to a point or in relation to a position. The

production and analysis of the polygons of Thiessen at the level of the municipal grid is complex and presents a varied situation (Figure 6). Analogies and dissimilarities exist at all levels.



**Figure 6: Application of the theory of minimum energy to M'sila province (polygons of Thiessen)**

There are examples of municipalities whose forms are imposed by nature, others whose very old fields emanate from sociological considerations as well as certain cases of concordance. The situations of dissimilarity are the most numerous and exist throughout the region; they present themselves according to variable and sometimes rational characteristics following certain natural or sociological conjunctures. The gaps that arise between the real limits and the theoretical limits are sometimes greater than the areas that remain around the main towns.

Some meshes are sometimes decided by the morphology of the relief; the shapes of the fields of the municipalities of Menaa, Bir foda, O.Madhi, M'sila, Ain Fres and slim at the level of the region of Hodna, have elongated shapes of the fields in all directions and in no way coincide with the optimal shapes from Thiessen polygons.

The municipalities of the province of M'sila are those whose very curious and very asymmetrical forms do not correspond to any spatial logic, more than 42% of the municipalities of this province are municipalities whose forms, very old, come from the forms of old douars.

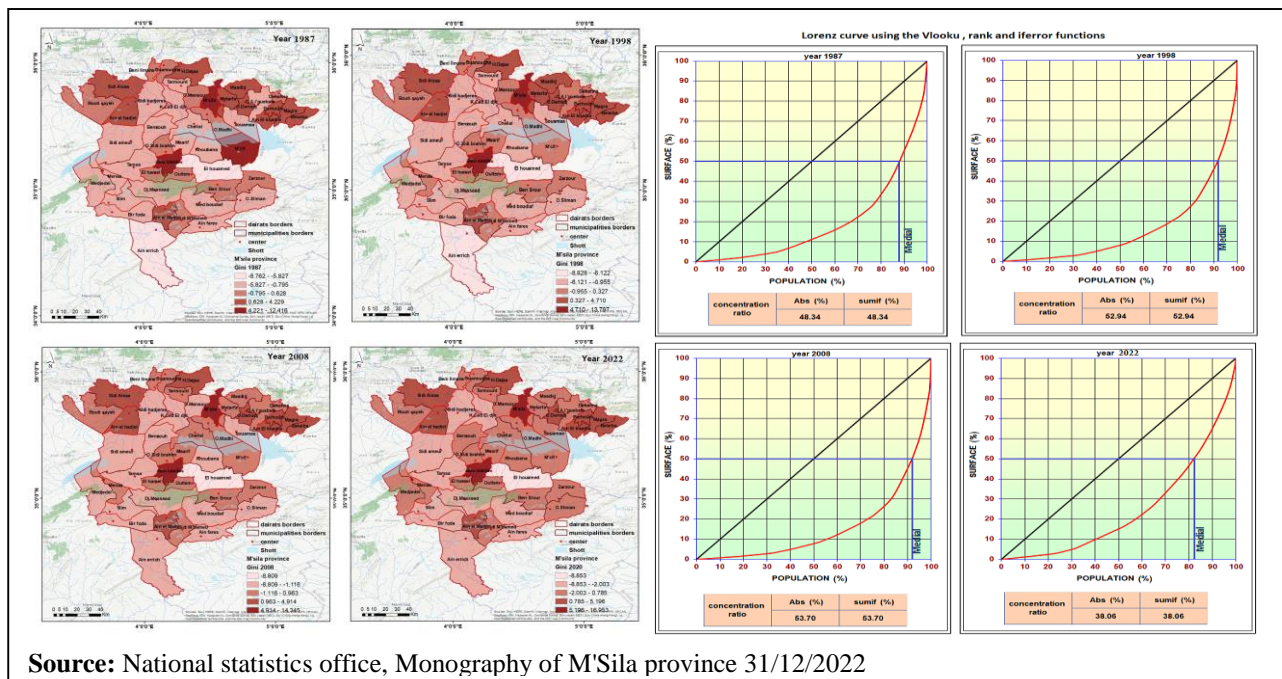
The situation of the chief towns in relation to the municipal territory must also be taken into consideration. The eccentric positions of certain chief towns often generate under-administered zones which correspond to the most remote sectors; they are subject to profound imbalances within the same municipality. This state of affairs is very widespread in the province of M'sila where 47% of the municipalities correspond to this situation; Medjedel, Slim, Sidi Aïssa and A in ElMelh are typical cases. This situation of dysfunction must be taken into account in any perspective of spatial redefinition. It makes it possible to reconsider isolated areas, especially if these are disadvantaged; it allows the creation or promotion of certain areas provided that these are not natural regions, that they include a locality which could serve as a capital and favorable population densities.

#### ***Measurement of population concentration (Lorenz curve and Gini index):***

The first category is that of high concentration units, and it includes the municipality of M'sila with the highest concentration of 16.95%, because it represents the capital of the province and its dynamic pole, and the municipality of Bousaada with a rate of 11% to be a pole in competition for the main center, The second category is the units of medium concentration and includes the population distributed in an optimal state or close to it and includes 16 municipalities, the Lorenz index varies between 5.20% (Sidi aïssa) and 0.12% (Elhamel) and this is the result of the compatibility between the area and the size of the population, The third category is made up of units with medium diffusion and includes the population distributed in a weak state or close to it, and it includes 28 municipalities, whether they are pastoral or sandy municipalities, as in the case of certain units in the south, Souamaa, Khoubana, Chellal, M'cif, Maarif and O. Madhi, part of its area These are saline lands (Shott), The fourth category with a high population dispersion and this category includes a single unit



(Lahouamed) with a dispersion rate of -8.85%, It is the least concentrated municipality across the province and the largest area with: 1745 km<sup>2</sup> and it has a desert steppe character and the spreading of sand dunes.



**Figure 7: Gini index and population concentration curves of M'sila province.**

The disparity in the concentration of the population results from the variation of the geographical, natural and human data, and from the disproportion between the surface of the units and the size of the population, the public authorities have often encouraged the inhabitants to move towards the regions. most disadvantaged, with economic and social facilities. Through these incentives, they hope not only to unclog the most popular sectors, especially the big cities, but also to try to integrate the territories hitherto marginalized into the process of overall social-economic development.

Generally, the objective sought is the establishment of a balanced spatial, demographic and social-economic network, that is to say, an optimum of settlement in order to attenuate the imbalances between the different regions of the same nation. (Raham, 1998).

The measurement of population concentration in relation to the extent of the territory at the level of the province of M'sila is based on a comparative statistical study of the populations of the 47 municipalities, on the basis of the results of the general censuses of the population and the habitat of 1987, 1998, 2008 and 2022, Comparison of the statistical parameters of dispersion of area, population and density gives an idea of the structural differences.

**Table 3. Statistical parameters of dispersion of the area, population and density of M'sila province**

Year	Area (km <sup>2</sup> )			Population (Inhab)			Density (inhab/km <sup>2</sup> )		
	standard deviation	Mean	C.V	standard deviation	Mean	C.V	standard deviation	mean	C.V
1987	294.263	286.702	0,761	17985.275	14324.489	1,256	69.125	52.859	1,308
1998	294.263	286.702	0,761	22826.876	17340.893	1,316	97.214	66.347	1,465
2008	294.263	286.702	0,761	29852.355	22016.191	1.356	127.944	84.009	1,523
2022	294.263	286.702	0,761	40189.146	27273.81	1,489	174.245	104.826	1,662

**Source:** National statistics office, Monography of M'Sila province 31/12/2022

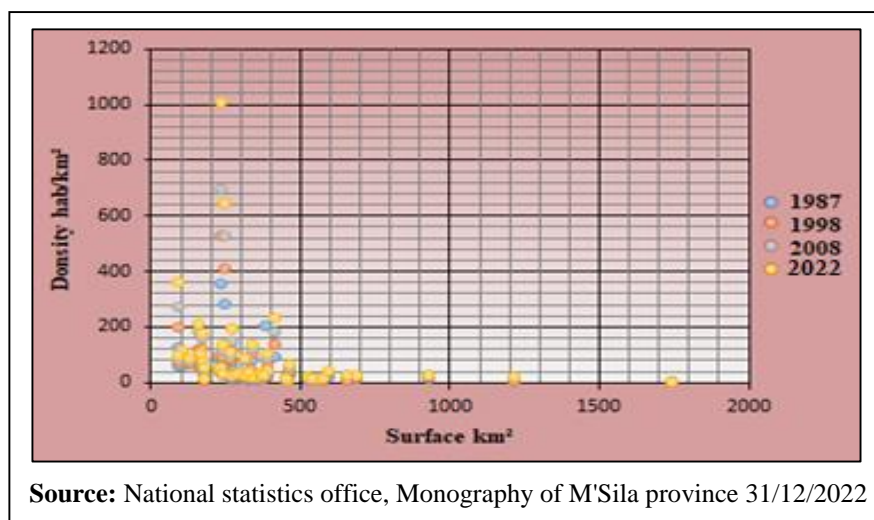
In 1987, the municipalities of the province of M'sila were semi-homogeneous on the demographic level without being so on the territorial level, which means the existence of disparities between the different administrative units. The intersection of population density with the area confirms this state of affairs by giving only a very average correlation coefficient of  $-0.3072$ , with 56 % of explained variance. The promotion of new administrative units in 1984 contributed to reducing the statistical difference and therefore to strengthen coherence between the different municipalities, the population concentration index in relation to surface area was 0.48, meaning that we are far from the even distribution curve, and therefore from a less homogeneous distribution of the population in relation to the territory. This trend is also confirmed by the value of the medial, which shows that 48% of the population of Hodna lived on 88% of the territory in 1987.

Indeed, through this division, it was a question of involving the most space and the most population possible in the development process by multiplying the number of administrative units. Although the population density has increased, the average population per municipality has decreased following a densification of the territorial network.

In 1998, a situation similar to that of 1987 is observed, with, however, slight increases in the rate of dispersion, a concentration index of 0.52 was recorded, an increase compared to 1987, slightly less than 92% of the population living in half of the territory. In 2008, an index of concentration of 0.53, a slight increase compared to 1998, a little less than 92% of the population living in half of the territory. The evolution of the population for the period 1998-2008 confirms the exceptional dynamics of the municipalities of M'sila, Bousaada, Sidi Aissa, Ain elmalh and Megra, which recorded the greatest demographic gain. For this last period, the dynamics of the rural population seem to play a large role in the overall dynamics (Redjem & Tacherift, 2010).

In 2022 the concentration index is 0.38, a slight decrease compared to 2008, a little less than 82% of the population living in half of the territory.

Indeed, there appears to be a fairly clear correlation between the behavior of the rates of variation at municipal level and their distribution at the scale of urban centers. This correlation is clearer, however, at the level of the chief towns. Strong fluctuations at the municipal level correspond, in fact, to strong demographic dynamics (gains or losses) at the scale of urban centers. This is particularly the case for municipalities located in the southern region of Hodna, municipalities whose population concentration is essentially linked to a change in administrative status. Indeed, the capital of the agglomeration being erected as an urban municipality, a good part of the initial changes residential status and becomes urban. At this scale of observation, there is therefore a certain trend towards a reduction in settlement disparities, but strong differences persist.



**Figure 8: Relationship between the population density of municipalities and their areas from 1987 to 2022**



*Spatial effects of administrative network on urbanization*

The increase in the number of agglomerations in M'sila was very significant and underpinned by rapid and massive demographic growth. The number of urban agglomerations with more than 5,000 inhabitants has quadrupled since the first post-independence census, rising from 04 agglomerations in 1966 to 17 in 1998 distributed in a privileged way in the northern part of the region. Taking into account the evolutions of nomenclatures defining the urban in Algeria, and in order to be able to establish comparisons between intercensal periods, we have chosen to establish a threshold of 5000 inhabitants. This threshold, supposed to define today the urban character of an agglomeration, will thus constitute a constant benchmark.

Like the previous intercensal period, all urban agglomerations retained their urban status. No new agglomeration reached the urban stratum (Figure 9). The number of agglomerations therefore remained stable with thirteen units, despite an increase in the urban population which was the strongest in the period 1966-2008, +237%, for an urban demographic increase of 30,083 individuals.

The largest urban agglomerations M'sila and Bousaada in this period exceeded 50,000 inhabitants, with 82,877 and 69,620 inhabitants respectively, Magra, characterized by relatively low growth compared to the rest of the agglomerations (+102%), hardly kept its rank of third agglomeration of M'sila in favor of Barhoum, which is therefore part of the class of +5000 inhabitants, like Ouled Adi Legbala, which is experiencing the strongest relative growth of this class (+383% , for 3696 inhab. in 1987), Ouled Derradj (4692 inhab.). All of these six agglomerations contributed for more than half of the urban growth of M'sila between 1977 and 1987.

Between 1987 and 1998, the urban growth of the towns studied underwent a clear shift, going from +224% over the previous period to +114%. Nevertheless, in absolute value the growth was the highest for an increase of +236,310 urban residents.

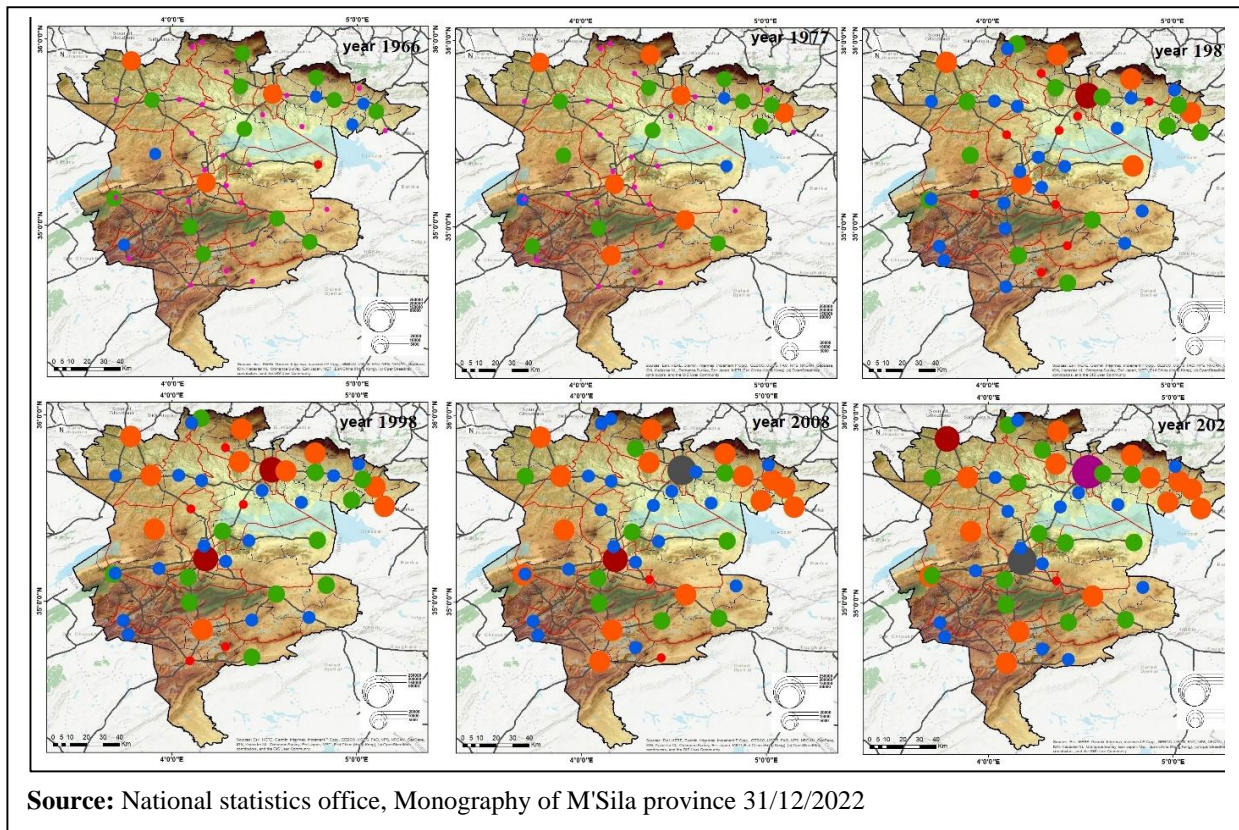
The absolute growth of the period 1987-1998 represented approximately 20% of the total urban growth measured between 1966 and 1998, which is considerable. The rate of urbanization measured for these cities was at the last census almost 50% against 54% for the North of the country.

The number of urban agglomerations in Hodna increased very strongly, going from thirteen to twenty-three in 1998. This development is very significant, and the changes were more marked. Eight agglomerations acceded to urban status and the rest of the 23 units kept the rural aspect.

The structure of the urban framework changed significantly, the top of the hierarchy grew, the number of towns with more than 20,000 inhabitants increased from two to six in 1998, two of which exceeded 80,000 inhabitants, the date on which they represented more than 65% of the urban population of M'sila.

The period from 1998 to 2008 displays practically the same pattern as the previous period, which means that the structure of the urban framework has remained stable except that it should be noted that the class of less than 5,000 inhabitants (Metarfa, Belaiba) experienced a fairly significant urbanization which is of the order of 18.59% against 13.44 in 2008. Thus, this period saw the emergence of new urban cores in particular Djorf, Brabra and Laraieb which, before a short time, were not than simple groups of dwellings.

Between 2008 and 2022 The largest urban agglomerations M'sila and Bousaada in this period exceeded 300,000 inhabitants, with 212,009 and 161,355 inhabitants respectively, Magra, characterized by relatively strong growth compared to the rest of the agglomerations (+148%), easily kept its rank as the fourth agglomeration of the M'sila, which therefore falls within the class of +10,000 inhabitants, like Metarfa, which is experiencing the strongest relative growth in this class (+239%, for 9100 inhab. in 2008), Sidi Aissa (66856 inhab.). All of these five agglomerations contributed for more than half of the urban growth of M'sila between 2008 and 2022.



**Figure 9: Evolution of the urban framework in M'sila province (1966-2022)**

The analysis of the different figures makes it possible to identify four demographic profiles, municipalities where the demographic weight is permanently high and constantly increasing. These are the municipalities of M'sila and Bousaada. The population of these municipalities has increased almost to three more times between 1987 and 2022, M'sila thus increasing from 82,877 to 236,913 inhabitants, Bousaada from 69,620 to 199,116 inhabitants.

This exceptional profile can be explained on both sides by a number of reasons. For the municipality of M'sila, the fact of hosting the capital of the province of M'sila has earned it of the region and therefore the first place of human concentration of all Hodna. Also, The rural areas of the commune of M'sila very favorable to the culture as well by its agropastoral vocation attracted, during the history, a large number of agricultural workers, most of whom have chosen to settle permanently (Redjem and Tacherift, 2010), the municipality of Bousaada is among the old municipalities and an urban center competing with the capital of M'sila province, because it has the necessary equipment and facilities that have worked to attract and stabilize the population and it owes its significant demographic weight to its position as a crossroads, and its transitional role as "gateway to the Sahara" has earned it the status of an obligatory passage in the context of travel of all kinds to the different regional centers, M'sila, Batna and Biskra.

To these two municipalities, we must add those of Sidi Aissa, Magra, H. Dalaa, Ain Lahdjel, Ain el Melh and Ouled Derradj, whose population growth experienced exceptional speed between 1977 and 2022 because of its promotion to the rank of municipalities chief towns districts, municipalities where the demographic weight is relatively stable, such as those of the southern part of M'sila (Khoubana, Med boudiaf, Oueled Madhi, Maarif, Slim, Menaa, Lahouamed...), municipalities where the demographic weight is unstable such is the case of Berhoum, Belaiba, Ain elkhadra, Ben Srouer and A.A. Guebala which experienced an imbalance of its population during the intercensal period 1987-2008, municipalities where the demographic weight is constantly decreasing, as is the case of Chellal, Sidi Mhamed, Ouled Slimene and M'cif.

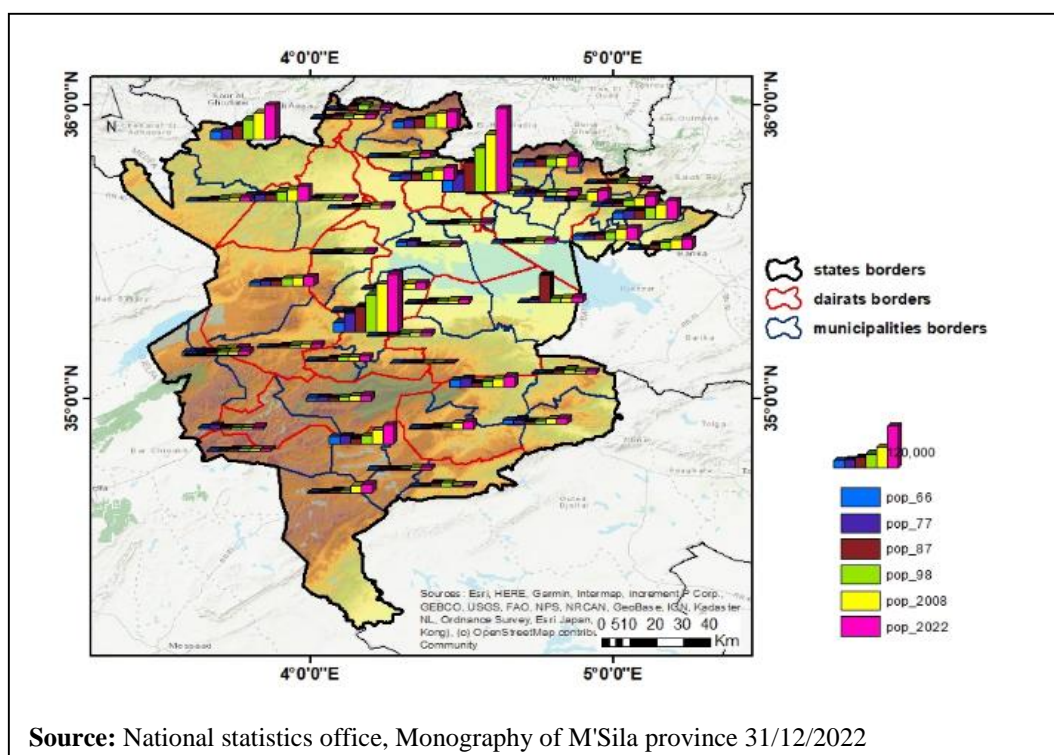
***The administrative reorganization of the territory and the urban network:***

Many agglomerations have been promoted to extended management functions. M'sila, promoted to the rank of capital of the

province, had 19,675 inhabitants in 1966 with an urbanization rate of 55.62%, For the chief towns of district and municipalities, and therefore for a considerable number of agglomerations, it is a question of raising villages or small urban centers to the rank of real cities. Some centers such as Ouled Derradj, Magra, Barhoum and Ouled Adi Legbala had less than 500 inhabitants. This reorganization, undertaken in 1974 and 1984, contributed to strengthening the powers of the provinces and municipalities by giving them new urban functions. So, this administrative promotion gave more finesse and flexibility to the management of the territories by allowing them to acquire various public services and administrations inherent to their respective ranks.

In the province of M'sila, there are fourteen promotions to the rank of chief town of district. They are Magra with 31749 inhabitants, H.Dalaa with 34777 inhabitants, Ouled Derradj with 22851 inhabitants, Chellal with 4330 inhabitants, Bousaada with 102245 inhabitants, Khoubana with 7069 inhabitants, O. Sidi Brahim with 10218 inhabitants, Sidi Amor with 20053 inhabitants, Sidi Aissa with 56,917 inhabitants, Ain El Hadjel with 27,601 inhabitants, Ain El Melh with 22,985 inhabitants, Medjedel with 18,577 inhabitants, Djebel Messaad with 11,308 inhabitants, and Ben S'rour with 19,063 inhabitants, which were simple chief towns of municipalities.

This proactive reorganization of the urban structure induces the creation of new facilities and services (technical, educational, sanitary), supporting the extension of urban functions.



**Figure 10: The population evolution of the municipalities of the province of M'sila 1966-2022**

#### **Situation of the proposed provinces (delegated province):**

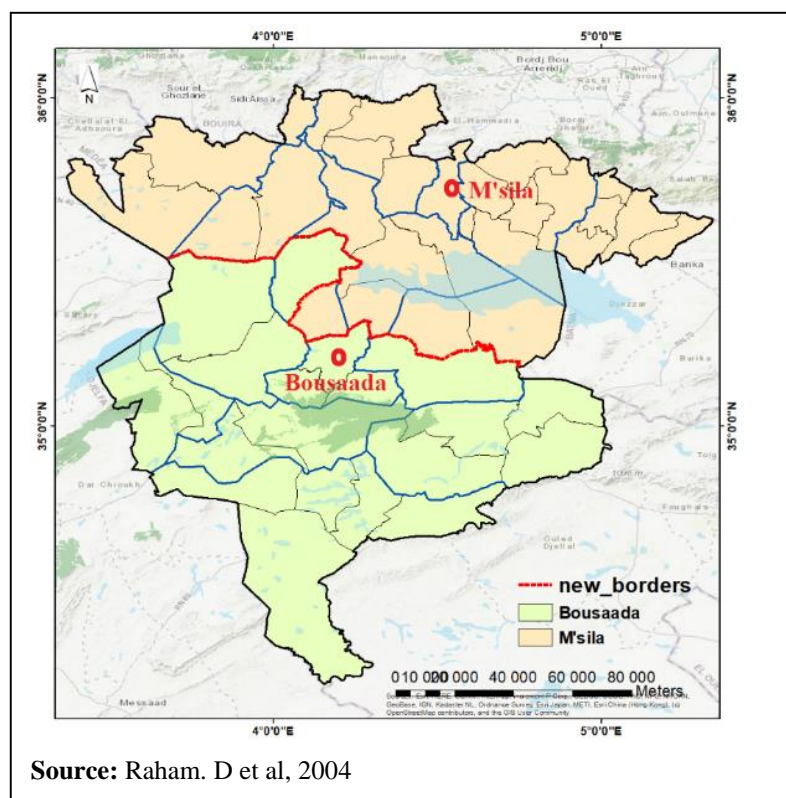
The polygons of Thiessen can show the imperfections or the correspondences which exist in an administrative division, The province of M'sila has limits which fit well with the model, M'sila is badly located compared to its territory whereas Bousaada seems better placed for a possible promotion to command the southern half of the province, The eccentric zones in relation to the territory of the province and which are located at the ends, therefore far from the main towns, sometimes correspond to under-administered and neglected regions.

Our way of seeing comes from the results of the various methods which served us as a prerequisite for presenting a new division of the province of M'sila. It is a question of proposing a new province which corresponds to territorial, geographical and demographic foundations founded and their size and shape would be all the more natural as it seems necessary. The



analysis of Figure 10, highlights the existence of zones wedged between several large cities or being isolated and could be the subject of administrative promotions.

The region concerned is represented in green (Figure 10) and essentially corresponds to the region of Bousaada south of M'sila and could replace it for this southern part of the province. The locality of Bousaada meets all the functional criteria for the creation of a new province at the level of the deprived area and where the population density is high, This locality meets the five requirements, demographically, the locality has a population of more than 150,000 (Bousaada 199,116 inhabitants in 2022), their province population, according to the proposed division, would be more than 300,000 inhabitants, territorially, the new constituency would have 21 municipalities, functionally, the new capital would be in a central position with respect to their respective territory, geographically, Bousaada animates the great plain of Hodna and on the service plan, it is connected by four roads of national importance as well as tracks departmental roads that crisscross the entire region and the other major towns that surround them.



**Figure 11: Situation of the proposed provinces (delegated province)**

Bousaada would be made up of the southern half of the province of M'sila where many municipalities (21 municipalities) are far from the capital M'sila, facing north; the city of Bousaada would be more appropriate to command this very marginalized region.

**Table 4. Genesis and properties of the proposed new province**

Province	Population		municipalities		Area (km <sup>2</sup> )		Form index (F)	
	Old	New	Old	New	Old	New	Old	New
M'sila	1387 157	886 361	47	21	17 852	7 261	0,5584	0,5060
Bousaada *	--	500 796	--	21	--	9 803	--	0,6352

Source: 2022 estimates. \*: proposed new province

The new forms of province fields would be more functional than the old ones (Figure 9). The proposed new province, Bousaada, correspond to square paving due to their plain situation and the regular shape of their territories. The only inconsistency corresponds to the province of M'sila whose fitness index is slightly decreasing but its situation is better balanced in relation to its "new" territory.

The use of Thiessen polygons is interesting when it comes to the problem of optimizing the territory at the intermediate level (province) and when the spatial logic prevails over the urgency of taking control of the territory.

### Conclusion

The purpose of this study is to shed light on the principles of municipal framework in the region of Hodna, compare the current municipal framework with theoretical frameworks and to see to what extent these models behave with the Hodna reality whose mesh is both complex and simple, and to characterize the main consecutive imbalances. The degree of spatial efficiency is assessed using an analysis and reading grid organized in two parts, Appreciation of the inequality in the spatial distribution of the population and their spatial temporal dynamics, the measurement and analysis of the shapes of the municipal meshes by the application of the shape index and the polygons of Thiessen. The administrative division or reorganization of the territory has a significant impact on the urban network and the stability of the population. Many agglomerations have been promoted to extended management functions, however, the contradictions seem to perpetuate and the Algerian model, like most Third World countries, remains characterized by the uneven development of the regions.

It is in order to highlight the particularities of the municipal administrative network of Hodna region that the study focused on the analysis of the spatial structures that compose it through the province of M'sila. The investigation focused on types of administrative networks considered as one of the main frameworks of the organization of space and the very foundation of any regional analysis, since any experience of development is above all spatial. Thus any territorial reorganization has a spatial meaning insofar as it constitutes the first entity where social groups begin to organize themselves, we speak in this case of administrative mesh which constitutes one of the essential pillars on which rests any prospect of economic development or domination of the territory in the goal of better controlling the space.

The division or the administrative reorganization of the territory has a significant impact on the urban structure of the province of M'sila and the stability of the population. Many agglomerations have been promoted to extended management functions. M'sila promoted to the rank of chief town province in 1966 After its population was 19,675 people, the population increased to reach 82 877 people in 1987, and 233 689 people in 2020. For the chief towns of district and municipalities, and therefore for a considerable number of agglomerations, it is a question of raising villages or small urban centers to the rank of real towns. Some centers such as Ouled Derradj, Magra, Barhoum and Ouled Adi Legbala, had less than 500 inhabitants. This reorganization, undertaken in 1974 and 1984, contributes to the strengthening of the powers of the provinces and municipalities by giving them new urban functions. So this promotion administration has given more finesse and flexibility to the management of territories by allowing them to acquire various public services and administrations inherent to their respective ranks. This proactive reorganization of the urban structure induces the creation of new equipment and services (technical, schools, sanitary facilities), supports for the extension of urban functions.

Hodna inherited a very inadequate space, it is a space characterized by deep regional imbalances. In addition to a segmented natural environment, the composite and disarticulated space where deep imbalances and pathological urbanization remain. In other words, the persistence of spatial inequalities still characterizes this space where a structure inherited from the colonial order and a marginalized traditional configuration coexist.

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