




RS Global
Journals

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

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

JOURNAL	International Journal of Innovative Technologies in Social Science
p-ISSN	2544-9338
e-ISSN	2544-9435
PUBLISHER	RS Global Sp. z O.O., Poland

ARTICLE TITLE	LEVELS DEVELOPMENT IN MOUNTAIN MUNICIPALITIES AND THEIR RELATIONSHIPS IN RESOURCE CONSTRAINTS [CASE STUDIES OF MUNICIPALITIES IN THE AURES REGION]
AUTHOR(S)	Khemri Souhila, Meddour Oualid, Redjal Omar
ARTICLE INFO	Khemri Souhila, Meddour Oualid, Redjal Omar. (2024) Levels Development in Mountain Municipalities and Their Relationships in Resource Constraints [Case Studies of Municipalities in the Aures Region]. <i>International Journal of Innovative Technologies in Social Science</i> . 2(42). doi: 10.31435/rsglobal_ijitss/30062024/8150
DOI	https://doi.org/10.31435/rsglobal_ijitss/30062024/8150
RECEIVED	18 April 2024
ACCEPTED	22 May 2024
PUBLISHED	26 May 2024
LICENSE	 This work is licensed under a Creative Commons Attribution 4.0 International License .

© The author(s) 2024. This publication is an open access article.

LEVELS DEVELOPMENT IN MOUNTAIN MUNICIPALITIES AND THEIR RELATIONSHIPS IN RESOURCE CONSTRAINTS [CASE STUDIES OF MUNICIPALITIES IN THE AURES REGION]

Khemri Souhila

*Dr., Lecturer, Institute of Earth and Universe Sciences University of Batna 2
Algeria*

Meddour Oualid

*Dr., Senior lecturer, Dynamic, Intelligent and Resilient Territories Laboratory (LABTERDIR)
Institute of Urban Technical Management, Constantine3 Salah BOUBNIDER University
Algeria*

Redjal Omar

*Dr., Senior lecturer, Architecture, Urban Environment and Energy Efficiency laboratory (LAEFF)
(ex: Energy and Environment laboratory), Institute of Urban Technical Management, Constantine3
Salah BOUBNIDER University, Algeria
ORCID ID: 0000-0003-4763-4441*

DOI: https://doi.org/10.31435/rsglobal_ijitss/30062024/8150

ARTICLE INFO

Received 18 April 2024

Accepted 22 May 2024

Published 26 May 2024

KEYWORDS

Local Development, Mountain Municipalities, Resource Constraints, Development Levels.

ABSTRACT

The article examines the levels of development in the mountain municipalities of the Aures region and their relationship to the regional development that the region is experiencing through several indicators that we will discuss in the classification. Since the study area belongs to the Aures massif, where geographical data partially converge, the article aims to understand the elements that led to the change in the image of the (old) mountain area and led to spatial, economic, social, functional, and especially environmental transformations, which have made the region increasingly vulnerable.

The regional development in the mountain areas has not been related to industrial development and local economic growth, which has made the urban growth a burden on local development in these areas rather than a factor of progress within them. After discussing the classification of the centers comprising the region, which varied in their levels according to the administrative status, the date of obtaining the promotion, the relationship of the centers to the road axes, and the origin of the establishment, we will discuss the classification of the municipalities based on a set of indicators to search for an explanation of the reality occurring in the study area.

We relied on the rank correlation matrix to understand the reasons for the disparities in the level of development among municipalities and to provide analyses of the results reached. We utilized 20 indicators, and the result of development in the municipalities was varied: the municipality of Arris witnessed good development, four municipalities had acceptable development, three municipalities had development from average to weak, and three municipalities had very weak development. The disparities were large, from the highest level to the lowest level of development. Several factors and reasons contributed to the development of some municipalities and the marginalization of others.

Citation: Khemri Souhila, Meddour Oualid, Redjal Omar. (2024) Levels Development in Mountain Municipalities and Their Relationships in Resource Constraints [Case Studies of Municipalities in the Aures Region]. *International Journal of Innovative Technologies in Social Science*. 2(42). doi: 10.31435/rsglobal_ijitss/30062024/8150

Copyright: © 2024 **Khemri Souhila, Meddour Oualid, Redjal Omar.** This is an open-access article distributed under the terms of the **Creative Commons Attribution License (CC BY)**. The use, distribution or reproduction in other forums is permitted, provided the original author(s) or licensor are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Introduction.

Through national programs, development in the mountainous areas of the Aures region always strives to make it an integrated part. However, it must be acknowledged that these are distinctive “sensitive” areas due to their geographical reality and natural influences. The Aures region is among those areas that undoubtedly know the phenomenon of urban development and mountain development, which is not to be underestimated in supporting the balance of the urban network in the region of Batna province. However, the limitation of resources remains the biggest obstacle to the advancement of these sensitive regions.

1. The Aures Regionally.

Location.

Geographically. It is located in the heart of the Aures and belongs to the Sahara Atlas Mountain range within the scope of Batna province. The Abdi Valley and the Abiod Valley form a transitional range between the mountain range (the Sahara Atlas) and the desert. The natural unit that includes these centers is the basins of the Abdi Valley and the Abiod Valley.

Administratively. The study area, which includes 12 municipalities, administratively belongs to Batna province and includes a total of 61 municipalities and 2 districts. It is located in the southeast of the province, with a northeast-to-southwest extension. The National Road No. 87 RN is one of the main features of the Abdi Valley region, and the National Road No. 31 RN is one of the main features of the Abiod Valley region, as it ensures the connection between the different areas of the two basins, which connects the city of Batna with the city of Biskra with an extension estimated at 150 km and serves the majority of the region’s municipalities. The study area is distributed as follows:

Abdi Valley area. It includes the municipalities: of Arris, Tighanimine, Ichmoul, Tkoutt, Ghassira, and Inoughissen.

Abiod Valley area. It includes the municipalities: Teniet El Abed, Chir, Bouzina, Larbaa, Mena, and Tigherghar.

Table 1. Municipalities of the study area and their administrative ranks.

District	Municipality
Arris	Arris - Tighanimine
Ichmoul	Ichmoul - Inoughissen
Tkoutt	Tkoutt - Ghassira
Teniet El Abed	Teniet El Abed – Chir
Mena	Mena - Tigherghar
Bouzina	Bouzina - Larbaa

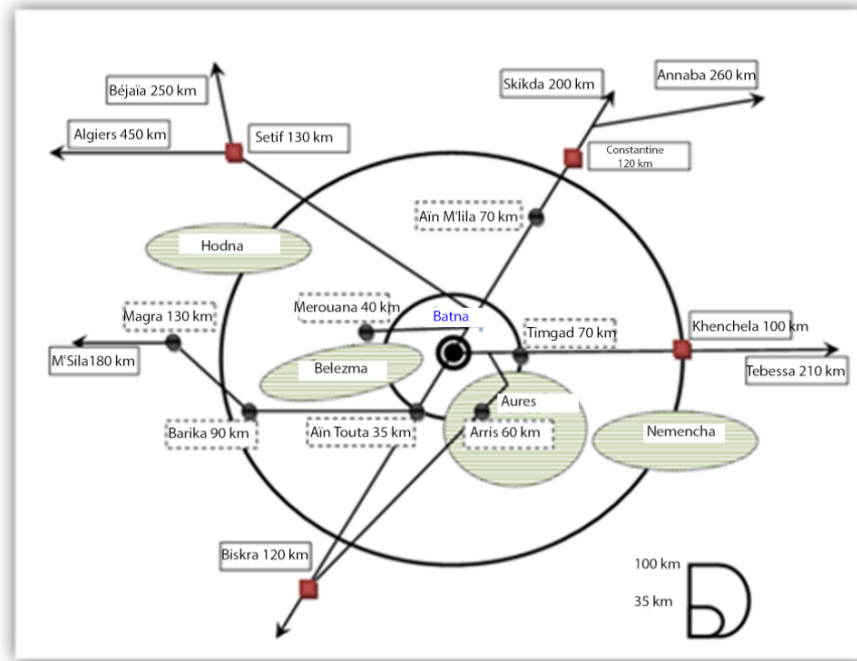
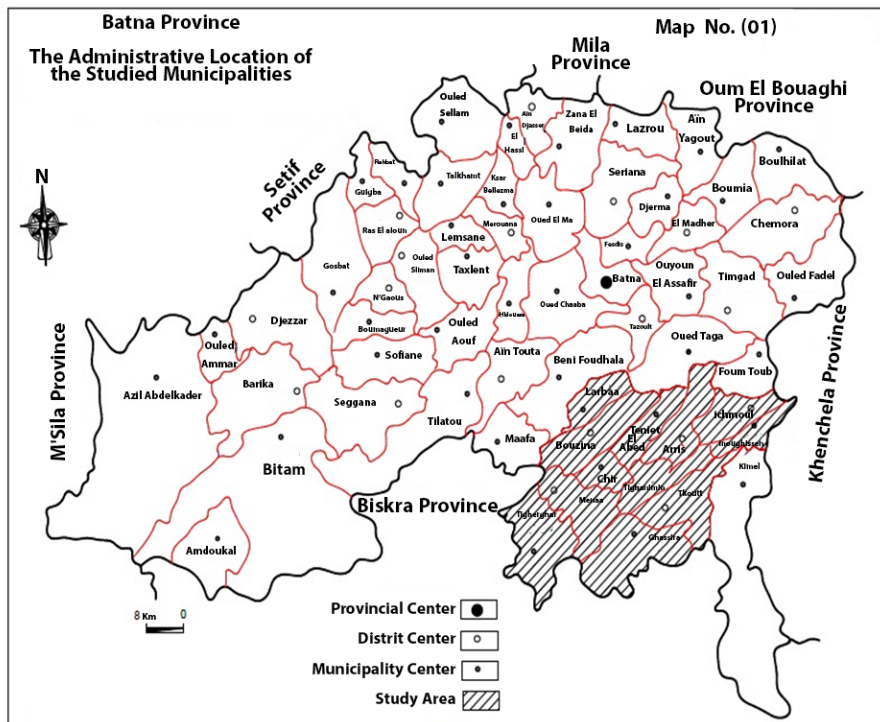


Figure 1. The importance of the location of the Aures within its geographical region.

Source: Philippe Thiriez, Cherif Merzouki: En Flanant Dans Les Aures. Numidia Editions, Ain M'lila, Algeria. Year 1986 - page 17.



Source: Development Plan for the Batna Province, Directorate of Planning and Urban Development, p. 16.

1. Municipal Development Plans in the Study Area.

The study area consists of a group of mountain municipalities in Batna Wilaya (province) that have benefited from significant projects within the framework of the Municipal Development Plans (PCD) and sectoral plans in various sectors. All these operations aim to improve the living environment of the citizens in terms of various facilities and equipment, especially potable water, sewage networks, and urban development operations that concern the rehabilitation of roads, public lighting, and the arrangement of garbage disposal sites. All these investments have created a kind of dynamism among the population within the main centers and secondary gathering sites, or from the centers to the neighboring cities, which is what we will discuss in this part of the research.

The spatial distributions of investments have a direct impact on the directions of population and workforce movements and, therefore, on the sizes of human gatherings and different regions and territories. This impact comes from what these services provide, regardless of their type (Lahcen Fartass, 2014). From this standpoint, we addressed the investment in the study area in terms of its size and distribution at the level of the study municipalities, and we limited ourselves to addressing the Municipal Development Plans (PCD) only, as most municipalities in the study area have benefited from them, which play a role in improving the living environment of the citizen and the social and economic conditions, and as the sectoral plans were limited to the municipalities that are the headquarters of the districts in particular.

2. Economic and Social Objectives of Municipal Development Programs.

Municipal development programs are considered one of the local development tools where all investment projects and equipment in the economic and social fields are recorded for the benefit of most municipalities in the country. They fall within the framework of public investment in order to achieve the following objectives (Lahcen Fartass, 2014):

- Matching between local works and the objectives and directions of the national development plan.
- Eliminating economic, social, and cultural disparities between different regions.
- Creating integration between the works recorded in the municipal equipment and investment schedule and the works programmed within the framework of the provincial sectoral plan.
- Achieving harmony between different sectors and eliminating structural imbalances among them.

3. Project Size in the Municipalities of the Study Area.

We discussed the projects programmed within the municipal development plans to demonstrate their extent of contribution to the development of the mountainous municipalities of the studied region and the extent of their impact on the urbanization of these vulnerable areas that suffered from the remnants of colonialism and the policies pursued by the country after independence. The study area has a set of projects, and through fieldwork across the study municipalities, it became clear that the municipalities with this population size, on the one hand, and the other hand, the main centers of district headquarters and municipalities, at the expense of secondary gatherings, received a large proportion of the investment. We tried to include the volume of investments in the following table, which represents the number of projects for the municipalities for the period 1999–2014 and their distribution according to the sectors.

- Generalization of the provision of the potable water network, as water is the basic element of life, without which an urban settlement cannot be established.

- Under the environmental protection law within the framework of sustainable development, it is obligatory to protect all regions from pollution, including the mountainous areas, which have programmed a set of projects in various programs to generalize the connection to the sewage network.
- The road is the basis of movement in the field, and its condition plays a role in the quality of movement. Therefore, the state has taken care of rehabilitating the roads, cutting new ones, and preparing paths and tracks.
- The citizens have been looking for the best service, the cleanest neighborhood, urban planning, and public lighting, among the complements of the residential field, which the state has included in its priorities in recent years. (Urban planning).

Methods and Data.

1. The sectoral distribution of investment projects in the study area.

By dividing the sectors across the municipal development plans according to the areas of intervention on the field and highlighting their role in the study region and their relationship with the development and urbanization of the Aures Mountain area, we included the data obtained from the Directorate of Planning and Development for Batna province for the municipal plans of the study area. We acquired the following table:

Table 2. Number of Projects in the Municipalities of the Study Area by Intervention Sectors 2014-1999)

sectors Municipalities	Irrigation	Economic Facilities	Social Facilities	Administrative Facilities	Total
Arris	53	41	71	20	185
Tighanimine	52	17	29	18	116
Ichmoul	31	20	36	4	91
Tkoutt	44	22	41	18	125
Ghassira	35	11	31	11	88
Inoughissen	23	20	25	8	76
Teniet El Abed	42	29	41	15	127
Chir	52	7	25	8	92
Bouzina	61	25	25	11	122
Larbaa	8	5	1	18	32
Mena	46	15	42	14	117
Tigherghar	36	7	15	13	71
Total	483	219	382	158	1242

Source: Directorate of Planning and Urban Planning - Batna + Data Processing.

From our analysis of Table 02, it is clear that the irrigation sector accounted for the largest number of development projects, with 483 projects out of the total number of projects in the region. In second place is the social facilities sector with 382 projects, leaving 219 projects for economic facilities and 158 for administrative facilities, while the agriculture and execution tools sectors remain without any projects in the municipal development plans in the study area.

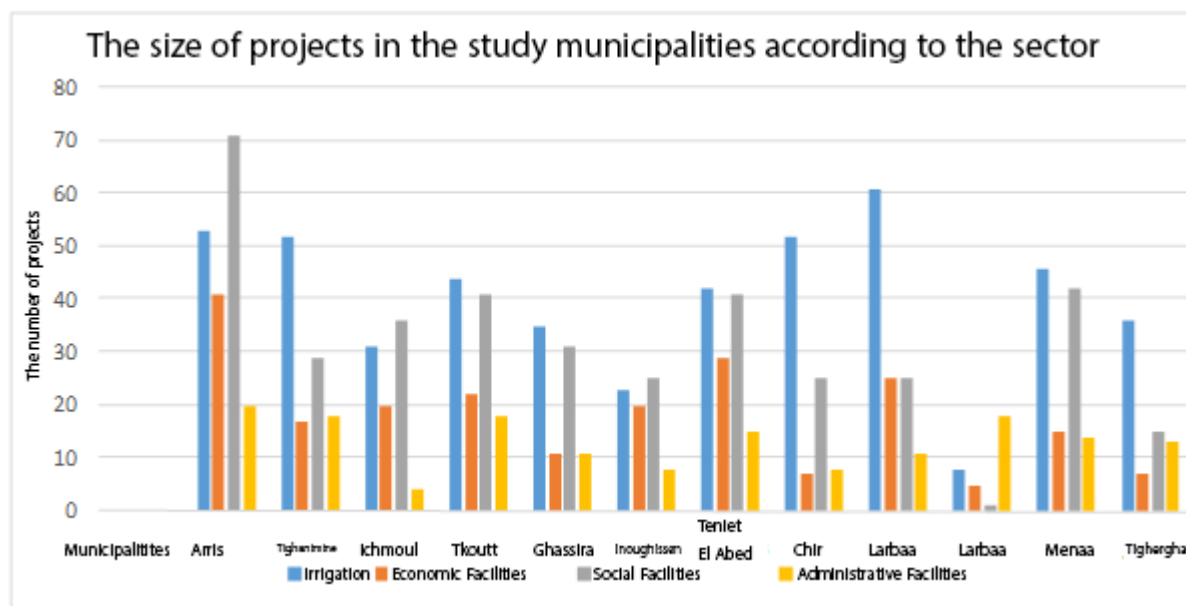
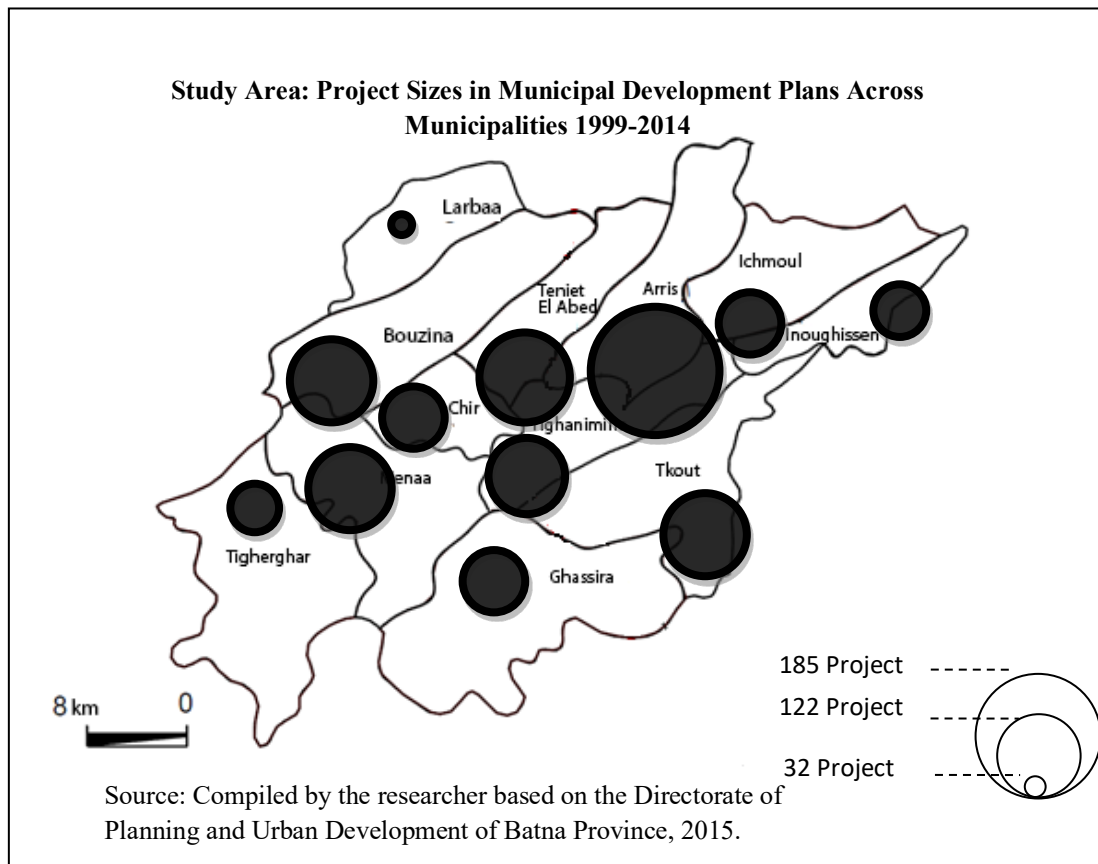


Figure 2. Projects in the municipal development plans in the study area.

From the analysis of Map 2, a disparity in the distribution of projects stands out, where it is clear that:

- ✓ The first category has more than 120 projects. These are the municipalities that have received more projects than others, including four municipalities have: Arris, Teniet El Abed, Bouzina, and Tkoutt.
- ✓ The second category ranges from 90 to 120 projects, represented by four municipalities: Tighanimine, Ichmoul, Chir, and Mena.
- ✓ The third category: Less than 90 projects and it is prominent in the municipalities: Ghassira, Inoughissen, Larbaa, and Tigherghar, which are the municipalities of the last administrative division in 1984.

2. Investment Distribution Across the Municipalities of the Study Area:



Map 2. Project Sizes in Municipal Development Plans Across Municipalities 1999-2014.

The investment process represents a new material gain for the Aures region, especially as it has experienced isolation in past periods. The aim of directing financial resources according to sectors is to ascertain the degree of concentration and the principles of priorities expected by the local Aures area. Moreover, investment is considered one of the key drivers of development in this region, constituting an element in the stability of the local residents. It can be said that despite its fragility in many areas, the Aures region still plays a role in local development, albeit with variations among the population centers of the studied area.

Through our analysis of the amount of investment data, we confirm that there is variation from one municipality to another. Arris municipality dominates the largest proportion of investments at 42.57%, being the largest in terms of population size, administrative factor, and the structured pole of the studied field, followed by Tkoutt municipality with 7.01%. The rate remains close between the headquarters of the districts, between 6 and 7%, except for the headquarters of the Ichmoul district, which benefited from 4.93%. The municipality comes in third in terms of investment size, with the lowest rate of 5% of the investment volume directed to the region, and in last place comes Larbaa municipality, with the lowest estimated rate of 2%, represented in social and economic projects aimed at resettling the residents who left it before but to no avail. Meanwhile, neither the agriculture sector nor implementation tools received any projects in these plans.

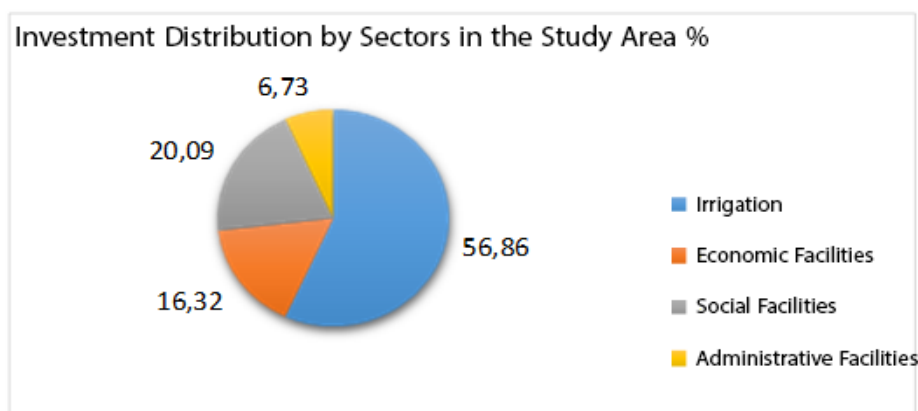


Figure 3. Investment distribution by Sectors in the Study Area.

3. Per capita share of the investment volume in the municipalities of the study area.

From the data on the size of investments and population numbers across municipalities, we have obtained the per capita share of investment across the municipalities in the study area. It became clear that there are disparities in the per capita share from one municipality to another, as indicated by the data in the table below. It can be categorized and distributed as follows:

Table 3. Per Capita Investment Share in the Municipal Development Plans in the Municipalities of the Study Area (2014-1999).

Municipalities	Investment Value (DZD)	Population count in 2015	Per capita investment (DZD per person)
Arris	3000668200	34 692	86494,53
Tighanimine	345644400	4 397	78609,14
Ichmoul	347417000	10 516	33036,99
Tkoutt	493990200	11 536	42821,62
Ghassira	291152400	7 933	36701,42
Inoughissen	329827000	3 522	93647,64
Teniet El Abed	474699400	12 089	39267,05
Chir	353737000	5 610	63054,72
Bouzina	516508500	13 680	37756,47
Larbaa	160870000	0	/
Manaa	438267600	14 724	29765,53
Tigherghar	295291000	7 362	40110,16
Total	7048072700	126 061	55910,02

Source: Directorate of Planning and Urban Development of Batna Province + Data Processing.

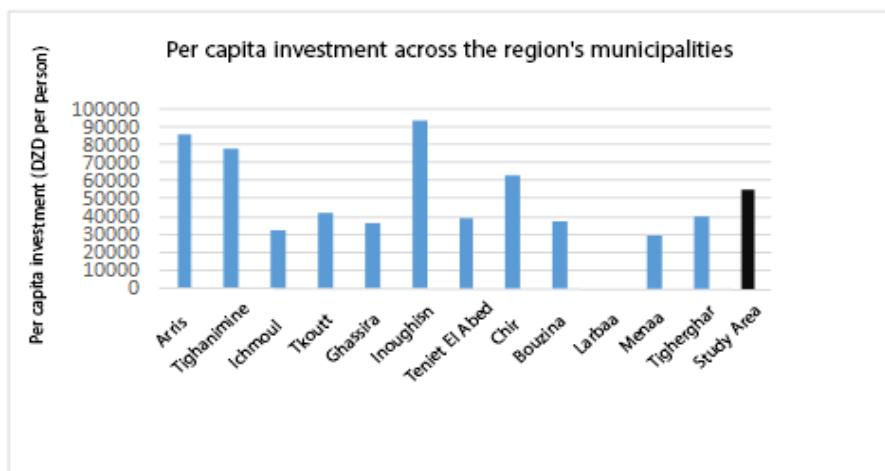


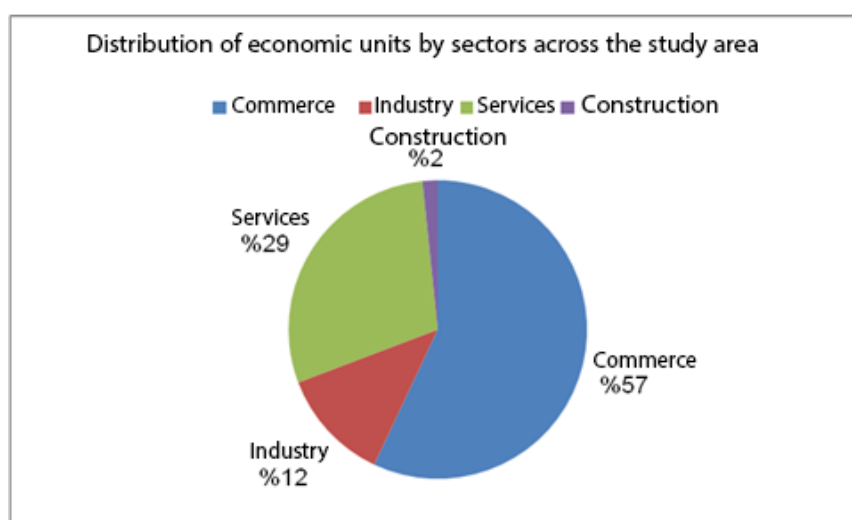
Figure 4. Investment across the regions.

From our analysis of the figure, it is clear that:

- There is a case where the municipality's population exceeds the investment ratio across municipalities compared to the total population of the region and the total investments directed within the framework of municipal development programs for the period between 1999 and 2014 in four municipalities: Arris, Chir, Inoughissen, and Tighanimine.
- Municipalities with a per capita share close to the region's average of 55,910 DZD are Tigherghar, Tkoutt, and Teniet El Abed.
- Municipalities with a weak per capita investment share stand out in four municipalities: Menaa, Bouzina, Ghassira, and Ichmoul. These municipalities serve as district headquarters due to their larger population compared to other municipalities, in addition to the availability of better-quality services than at the municipal level.

4. Distribution of economic units according to sectors in the study area.

Based on the results of the first economic census in the country, economic units are classified according to the activities practiced, as shown in Table 04 and the following figure.



Source: National Office of Statistics - First Economic Census in Algeria for the year 2011. Pages 129, 130.

Table 4. Study Area: Distribution of Economic Units by Sectors across Municipalities.

Municipalities	Economic Units				
	Commerce	Industry	Services	Construction	Total
Arris	415	89	212	12	728
Tighanimine	25	04	07	0	36
Ichmoul	99	12	54	0	165
Tkoutt	135	25	67	0	227
Ghassira	55	36	26	0	117
Inoughissen	16	06	23	0	45
Teniet El Abed	132	18	83	0	233
Chir	64	18	27	0	109
Bouzina	122	22	38	0	182
Larbaa	0	0	0	0	0
Menaa	156	33	87	19	295
Tigherghar	47	14	21	0	82
Total	1266	277	645	31	2219

Source: National Office of Statistics - First Economic Census in Algeria for the year 2011.

5. Classification of study municipalities according to the size of economic units.

According to the results of the economic census across the study area, a total of 2219 economic units were surveyed, distributed unevenly among the study municipalities. Some municipalities include numerous units, while others have only a few units. The subsequent figure highlights four categories in which municipalities are distributed according to the size of the units they contain.

- 1st category (more than 700 economic units): includes Arris municipality's (728 units) and is considered the most fortunate among all municipalities in the region (population size, administrative factor, historical factor).
- 2nd category (200 to 300 economic units): Each of the 3 municipalities (Menaa, Teniet El Abed, and Tkoutt) falls into this category. Menaa and Tkoutt are administrative centers with long-standing roots in the region, and Teniet El Abed municipality benefited from investments from post-1984 administrative reforms.
- 3rd category (100 to 200 economic units): This category includes 4 municipalities: Bouzina, Ichmoul, Ghassira, and Chir. They contain an average number of units. Bouzina and Ichmoul are recently established administrative centers and their peripheral location makes them less attractive than the first-category municipalities. Ghassira and Chir municipalities are the latest administrative divisions, and security factors have contributed to the migration of many residents.
- 4th category (less than 100 economic units): highlighted in each of the municipalities (Tigherghar, Inoughissen, and Tighanimine), which contain few economic units for several reasons. Tigherghar has a strong connection to the city of Ares, Tighanimine is a recent center, and migration towards the south (oil region) has affected Tigherghar, while Inoughissen has a small population size and its location does not encourage investment in its mountainous area, being far from the national road (communication factor).

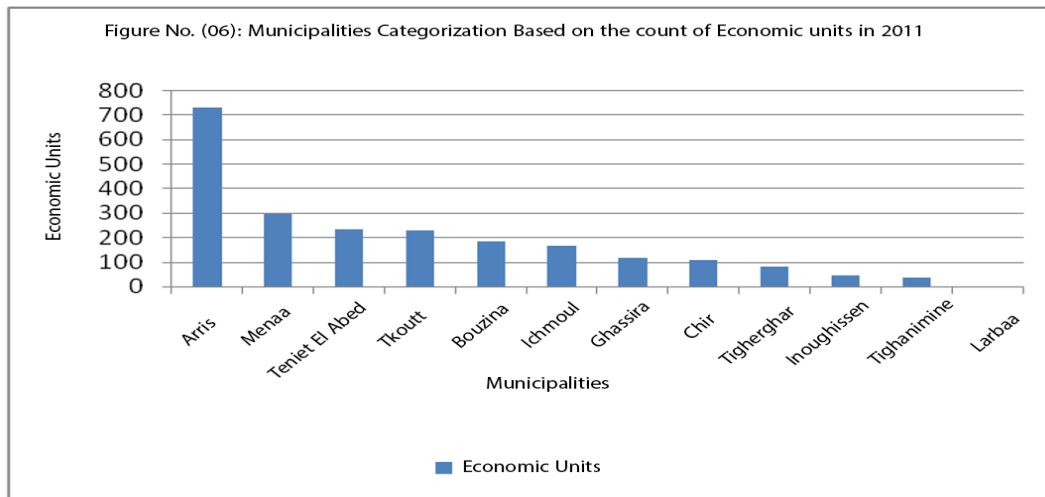


Figure 6. Municipalities categorization (2011).

Economic Units Size Criterion

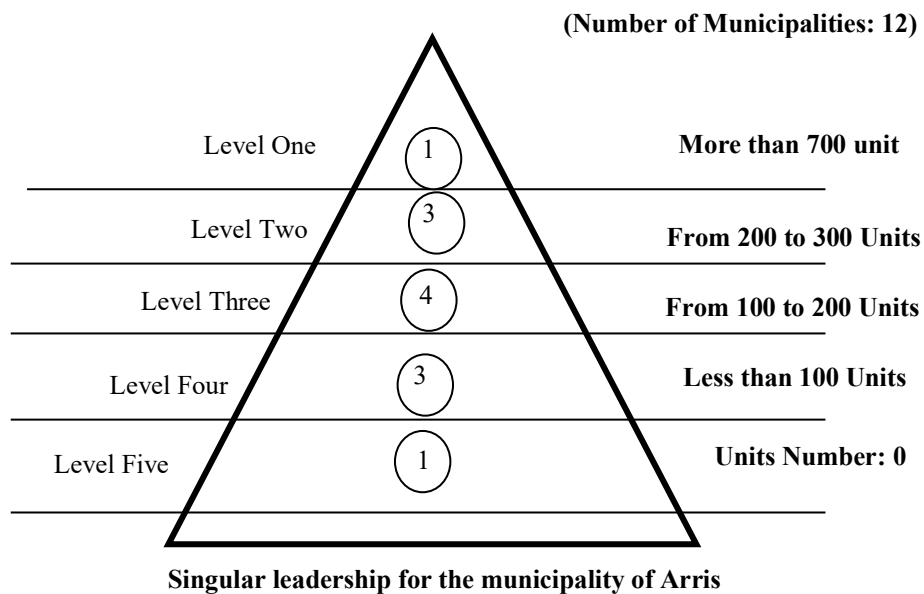


Figure 7. Level of the Studied Municipalities.

Results and discussion.

1. Classification of Development Levels for Municipalities in the Study Area.

After addressing the classification of the constituent centers of the region, which varied in their levels based on administrative status, date of promotion, relation to road axes, and origin of establishment, we will now discuss the classification of municipalities based on a set of indicators to understand the current situation in the study region. We utilized 20 indicators, distributed into four groups as follows:

A. Demographic Indicators:

- Population count for 2008.
- Population growth rate for 2008.
- Average population density.
- Net migration between 1998 and 2008.
- Percentage of urban population / Total municipal population.
- Dependency ratio.

B: Economic Indicators:

- Number of economic establishments, Census 2011.
- Percentage of irrigated land / Arable land area.
- Unemployment rate.
- Service employment / Total employment.
- Per capita share of municipal development programs (PCD).

C - Social Indicators:

- Percentage of roads in the municipality.
- Level of medical coverage / General practitioner.
- Distance to schools for primary level students.
- Distance to schools for secondary level students.
- Percentage of connection to drinking water.
- Percentage of connection to wastewater.
- Percentage of internet users.

D - Infrastructure Indicators:

- Number of commercial establishments / 1000 population.
- Total infrastructure facilities / 1000 population.

We were unable to use certain indicators, such as seats/1000 population, as transportation in the region is pivotal, with many municipalities relying on transportation to neighboring municipalities.

Table 5. Rank Matrix for the Study Municipalities.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	Rank
Arris	1	5	1	5	6	1	1	4	1	1	2	5	1	1	1	4	1	1	1	1	44	1
Tighanimine	10	1	8	1	11	6	11	5	7	11	3	9	11	8	8	2	4	4	9	10	139	8
Ichmoul	6	2	2	2	10	5	6	3	5	6	10	1	4	5	3	9	4	3	3	5	94	4
Tkoutt	5	9	6	7	4	7	4	4	9	5	5	4	2	3	2	5	1	10	4	2	98	5
Ghassira	7	7	9	10	5	3	7	10	2	4	9	6	7	4	10	1	1	5	10	9	126	6
Inoughissen	11	6	7	6	9	9	10	2	8	9	1	11	9	10	11	10	3	9	11	11	163	11
Teniet El Abed	4	4	2	4	8	2	3	1	4	2	7	3	5	6	6	8	8	2	5	3	87	3
Chir	9	10	4	11	1	10	8	9	11	7	4	10	10	9	9	7	5	7	7	8	156	9
Bouzina	3	3	5	9	7	11	5	8	10	8	8	2	6	7	5	6	7	11	6	6	133	7
Larbaa																						
Manaa	2	3	3	3	3	4	2	6	3	3	11	7	3	2	4	3	2	6	2	4	76	2
Tigherghar	8	8	10	8	2	8	9	11	6	10	6	8	8	11	7	11	6	8	8	7	160	10

Source: Compiled by Researchers.

From our analysis of the development levels matrix for the study municipalities, we obtained the levels in the following table.

Table 6. Levels of Development in the Municipalities of the Study Area.

Municipalities	Total Ranks	Rank	Level
Arris	44	1	Level One
Mena	76	2	Level Two
Teniet El Abed	87	3	Level Two
Ichmoul	94	4	Level Two
Tkoutt	98	5	Level Two
Ghassira	126	6	Level Three
Bouzina	133	7	Level Three
Tighanimine	139	8	Level Three
Chir	159	9	Level Four
Tigherghar	160	10	Level Four
Inoughissen	163	11	Level Four
Larbaa			Abandoned municipality

Source: Compiled by Researchers.

From our analysis of the table, four levels of development across the municipalities of the study area are apparent as follows:

Level 1. This represents the most developed municipality in the study area, which is the municipality of Arris, with a total score of 44. It serves as the old district headquarters, encompassing the study municipalities, and historical factors (date of establishment) and administrative factors play a role in the development of this municipality.

Level 2. Moderate development, consisting of four municipalities, including Mana, Teniet El Abed, Ichmoul, and Tkoutt, with total scores ranging from 76 to 98. These municipalities represent recently upgraded district headquarters, with varying origins, and have benefited from a range of investments and programs that have contributed to their development.

Level 3. Development ranges from moderate to weak, with total scores ranging from 126 to 139. It includes two municipalities (Ghassira and Tighanimine) and a district headquarters. The low level of development in this category is attributed to the administrative status of the municipalities, the geographic location of the district headquarters, particularly Bouzina, which is situated on the axis of Provincial Road 54, and the topographical characteristics of the area, leading to fragmentation of the region by the hydrographic network.

Level 4. Very weak development, comprising three municipalities with total scores exceeding 159, including Chir, Tigherghar, and Inoughissen. Security factors have contributed to mass emigration from these municipalities, especially given their geographic location, particularly in Inoughissen and Tigherghar, where topographical factors hinder investment in the region. Additionally, these are new municipalities with no financial resources or economic activity. The intention was to expand state institutions to encompass all national territory and bring administration and public service closer to citizens, even in isolated areas of the country (CENEAP).

Table 7. Level of Development in Municipalities.

Municipalities	Good Development	Acceptable Development	Moderate – weak Development	Very Weak Development
Arris				
Tighanimine				
Ichmoul				
Tkoutt				
Ghassira				
Inoughissen				
Teniet El Abed				
Chir				
Bouzina				
Larbaa				Abandoned municipality
Mena				
Tigherghar				
Development level	Development Level			
	Good Development	1		
	Acceptable Development	2		
	Moderate – weak Development	3		
	Very Weak Development	4		

Source: Compiled by Researchers

2. Relationship between Development and Resource Limitation in the Study Area.

a. Disparities in Natural Qualifications.

The limitation and fragility of natural resources constitute one of the major obstacles to local development (Ibrahim Al-Turki et al. 2016) in the study area. This has led the population of the region to rely on subsistence agriculture, which used to meet their needs in the past by relying on rained crops and livestock farming, utilizing the available natural resources in the area. However, with successive years of drought, irregular precipitation, soil depletion due to intensive exploitation of agricultural land, and a decline in grazing areas, investigations and interviews with the inhabitants of the area have yielded several results:

- ✓ Some springs have dried up, while others used for irrigating agricultural land have experienced reduced flow. Earthen dams, constructed either by the inhabitants or with state assistance, were used for this purpose. The construction of the Bouzina dam, currently in

progress, offers development prospects for mountainous municipalities in the area, especially those in the western part of the study area.

- ✓ There are fluctuations in rainfall, with the northern regions receiving larger amounts of rainfall compared to the southern regions. High-altitude areas receive more rainfall than low-lying areas, leading to population migration to the urban sector, with the returns from this activity no longer meeting the needs of those engaged in it.
- ✓ Decreased productivity due to soil exhaustion and contamination of the water sources, especially the rivers (Abdi Valley, Abiod Valley, and Bouzina Valley).
- ✓ The topographical factor influences development levels across the municipalities in the study area. The northern regions are less rugged than the southern regions. There is a sense of prosperity in municipalities like Ichmoul, Arris, and the northern part of Teniet El Abed (El Mahmal and Karza), while smaller areas are found in the southern part (Manaa and Tigherghar). The eastern region of Bouzina is less developed than the western region.
- ✓ There are differences in vegetation cover, with denser vegetation in the northern basin compared to the southern basin, which is dominated by scrubland.

Therefore, natural elements significantly influence the level of development in municipalities, as either stimulants or hindrances to human activity. Among the most influential factors are water, soil, and climate.

b. The proximity to and distance from major transportation axes.

The road network remains the cornerstone in solving the issues of isolation and marginalization, ensuring connectivity between urban centers, facilitating the utilization of local resources, enhancing the standard of living for residents, and facilitating the attraction of direct investments to various regions.

c. The dispersion and proximity of secondary agglomerations to the main agglomeration.

Through our analysis of the spread of secondary agglomerations across municipal centers, it became clear that municipalities with secondary agglomerations located at close distances experienced more development compared to municipalities where the distance between the main agglomeration and its secondary centers was greater. Proximity fosters relationships between centers and creates a flow of exchange between both sides, resulting in additional activities. Conversely, in municipalities with distant main centers, the movement tends to be one-sided.

d. Urban development tools created disparities in levels.

- Urban planning and development tools before 1990.

The state realized that managing municipal areas and organizing them was not merely about establishing administrative and technical bodies for monitoring and problem-solving but also about a political will and a strategic test aimed at determining the optimal framework for streamlining growth and promoting development in a coordinated manner that ensures the best living conditions for residents and focused on the legal and technical tools necessary for this policy. It obligated the main centers of municipalities to design the primary urban plan.

- Municipalities that benefited from the primary urban plans in the region.

These are the municipalities of Arris, Tkouit, Ichmoul, Teniet El Abed, Bouzina, and Menaa. They were supported by a set of facilities and equipment, housing allocations, and collective housing. This factor qualified them to occupy a higher level in the hierarchy between the municipalities. The only municipality that has experienced weak development is the municipality of Bouzina. This is due to its marginal location in the region, located on a provincial axis (Provincial Road 54), and the topographic nature of the municipality's territory.

- Municipalities that did not benefit from the primary urban plans in the region.

These are the municipalities of Inoughissen, Ghassira, Tighanimine, Larbaa, Chir, and Tigherghar. All these municipalities did not benefit from this plan because they were not

municipalities at that time but were secondary settlements affiliated with the original municipalities. The nature of the plan is that it focuses on the main settlement rather than other secondary settlements affiliated with the same municipality, and what explains this is the presence of these municipalities in the category of municipalities with a level (weak to very weak) in terms of the hierarchy in development.

- Urban planning and development tools after 1990.

The chances of benefiting from planning and organization operations varied among municipalities in the region, so some centers have experienced operations to attract residents of other municipalities of the same level, as well as residents of rural and scattered areas. Therefore, they can rise to a higher and better level, and they can in the future occupy a position in the region that creates alternatives for residents who were unable to live in settlements that have more services. Thus, they will be more effective in organizing the area in the region.

e. The historical factor.

The impact of the historical factor lies in creating disparities in development levels between municipalities through the influence of the French administration on the local area, which affected the structuring of the area and caused a series of measures that disrupted the stability of the local community and its organizations.

The division of the tribes into clusters was a policy that affected the old and familiar interactions between the local and regional regions of the area. The picture of the occupation period lies in the fact that economic and social relations and their organizations were not the result of self-development. Not based on its internal logic but with a rapid transformation imposed by the colonizer, who brought with him a strange system. The impact of this factor lies in the administrative level of the Arris center during the colonial period, which was responsible for managing the management of the entire study area, and what followed was the benefit of some basic structures and equipment, which gave it the lead in the region since the colonial period.

f. Administrative division in 1984.

The beginning of the transformation of the Aures region was marked by the creation of six municipalities, three in the Valley of El Abiod region, represented by the municipality of Inoughissen, which was affiliated with the municipality of Ichmoul; the municipality of Tighanimine, which was affiliated with the Arris region; and the municipality of Ghassira, which was affiliated with the Tkoutt region. And 3 municipalities in the Wadi Abdi region, namely the municipality of Larbaa, which was affiliated with the Bouzina region; the municipality of Chir, which was affiliated with the Teniet El Abed region; and the municipality of Tigherghar, which was affiliated with the municipality of Menaâ.

Furthermore, the administrative promotion of the Teniet El Abed municipality in 1984 and the creation of the Dhraa Taga (ACL) urban center, after the main center of the municipality was the village of Teniet El Abed, followed in terms of facilities and equipment at that time, which became the only district in the Wadi Abdi region that included 7 municipalities, namely Oued Taga, Bouzina, Larbaa, Teniet El Abed, Chir, Menaâ, and Tigherghar, where this promotion gave a strong boost to the local development of the municipality and the urban development of the gathering. The following table shows the relationship between administrative promotion and the level of development in the municipalities.

Table 8. Relationship between administrative promotion and the level of development in the municipalities (growth).

The Administrative Amendment of 1963	The Administrative Division of 1984	The Administrative Amendment of 1991	Municipalities Level
Arris (District)			Good Development
Tkoutt (Municipality)		Tkoutt (District)	Acceptable Development
Ichmoul (Municipality)		Ichmoul (District)	Acceptable Development
Bouzina (Municipality)		Bouzina (District)	Moderate to Weak Development
Menaa (Municipality)		Menaa (District)	Acceptable Development
Teniet El Abed (Municipality)	Teniet El Abed (District)		Acceptable Development
	Tighanimine (Municipality)		Moderate to Weak Development
	Ghassira (Municipality)		Moderate to Weak Development
	Inoughissen (Municipality)		Very Weak Development
	Larbaa (Municipality)		Abandoned Cluster
	Chir (Municipality)		Very Weak Development
	Tigherghar (Municipality)		Very Weak Development

Source: Compiled by Researchers.

- **The first level, the largest growth: Good Development.**

In this level, the municipality of Arris ranks first. It has been the administrative center of the district since the colonial period, which has made its area more valuable. It benefited from structures and facilities, being one of the oldest municipalities in eastern Algeria. Consequently, it benefited from a significant share of municipal development programs, accounting for 42.57% of the investment value in the study area.

- **Good Development: (Municipalities Moving towards Progress - Acceptable Development).**

This level includes four municipalities, each of which dates back to the administrative reform of 1963. These are the municipalities of Tkoutt, Ichmoul, Teniet El Abed, and Menaa. The municipality of Teniet El Abed was promoted in 1984, while the municipalities of Ichmoul, Tkoutt, and Menaa were created in the administrative reform of 1991. The location of Tkoutt and Ichmoul on national highways played a role, as did the topographic nature, soil type, and climate. The activity zone and the special fruit processing units contributed to the development of Menaa. The municipality of Teniet El Abed benefited from projects after the administrative division of 1984, as it was responsible for supervising seven municipalities, as mentioned earlier. The benefits included a set of educational facilities, vocational training, collective housing, and cultural and sports facilities.

- **Medium to weak development level: Reconsider the situation of these municipalities.**

This level highlights three municipalities, two of which were newly established in 1984: the municipalities of Ghassira and Tighanimine. The municipality of Bouzina is considered old in origin and has been the headquarters of a district since 1991. Bouzina's classification at this level is due to its limited capabilities, its marginal location in the study area, the lack of connection to the road network (the provincial road number 54), the link between the

municipality and the adjacent area (north or south), and the weakness of the programs that the municipality benefited from compared to its administrative level and other districts.

As for the municipalities of Tighanimine and Ghassira, they were classified at this level better than the level of other newly established municipalities classified at the last level, as they are located on the road axes and have a wide spread of craft workshops across their municipal field. The two municipalities can play a future role in developing their role for the proximity factor from the city of Aries, especially the real estate problem that the city suffers from.

- **Very weak development level: Dying municipalities.**

This level includes three newly established municipalities, namely Tigherghar, Chir, and Inoughissen. The municipality of Tigherghar suffered from the security crisis, and the headquarters of the main center, newly established (creating a new center, it is difficult to equip and develop it from the base), and its secondary center are far from the municipality headquarters; that is, they do not play any role in development, in addition to the lack of capabilities, the difficulty of the terrain, and the climate that is exposed to desert currents.

The municipality of Chir is a municipality where the majority of its population revolves around the national road 87, as a result of their sliding in the nineties from the heights (mountains and villages) and the search for security.

The municipality of Inoughissen is a scattered municipality with a point distribution for the main and only center in its field; its recent emergence is a factor of weak development, as is its marginal location and dependence on the headquarters of the Ichmoul district.

g. Administrative Function. Urban centers that have contributed to organizing and structuring the urban dynamics in the studied region are supposed to be the headquarters of districts and some municipalities that focus on the hierarchical sequence of services suitable for the requirements of these centers, such as district offices, municipalities, and secondary settlements. This has helped create new jobs. However, the administrative function in mountainous urban centers is very limited, or the services alone are not sufficient to develop these urban centers. Therefore, there is a need to develop their industrial functions (Boulhwach Allaoua, 2010) (such as small industries and promoting collective workshops) that rely on local raw materials, including the products of fruit trees in the region (apricots, apples, peaches, pears, etc.). Despite the existence of the Mena unit affiliated with the N'Gaous company and some private institutions, they are not sufficient to develop the region and require a lot of investment. limited job positions, sometimes temporary.

- **Industry.** Despite the low percentage of industrial land use in the study area, the levels of development for municipalities show that the municipality of Arris ranks first, including a single industrial zone in the study region. In the second position is the municipality of Mena, which includes an area of activities, including a facility for food and beverage industries, a wood processing unit, and small enterprises for fruit processing, employing several workers regularly as needed.

- **Economic Units.** The recent decades have witnessed the state relinquish its dominant role during the socialist regime, and the subsequent market economy system distinguished itself by relinquishing many state roles in organizing and supporting the national economy, giving freedom to the private sector for investment. Through the results of the first economic census and the results obtained through the municipalities in the study area mentioned earlier, the widespread presence of economic units across municipalities varies from one municipality to another.

Table 9. The number of the economic units across municipalities.

Municipalities	Arris	Tighanimine	Ichmoul	Tkoutt	Ghassira	Inoughissen	Teniet El Abed	Chir	Bouzina	Larbaa	Mena	Tigherghar	Total
Number of Economic Units	728	36	165	227	117	45	233	109	182	0	295	82	2219
Percentage of Total Units (%)	32,81	1,62	7,44	10,23	5,27	2,03	10,50	4,91	8,20	0,00	13,29	3,70	100

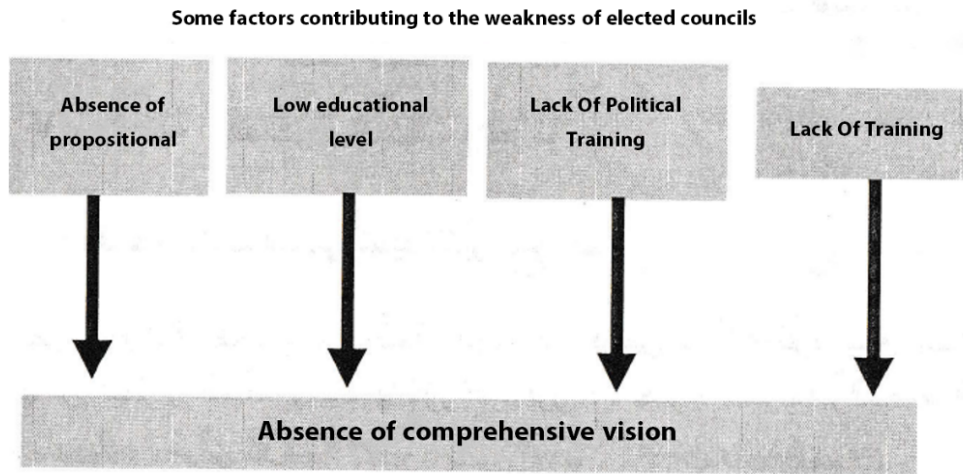
Source: National Office of Statistics - First Economic Census in Algeria for the year 2011.

From our analysis of the previous table, it is clear that there are 2219 economic units spread across the study municipalities in a contrasting manner. The municipality of Arris has 728 units, representing 32% of the total, followed by the municipality of Mena with 295 units, representing 13.29%. Their distribution varies according to the size of the municipalities, their location relative to the road axis, and the administrative level. Therefore, we find that newly established municipalities have a small number of economic units, the municipality of Inoughissen with 2.03% of the total units in the study area, and Tighanimine with 1.62%. Consequently, the levels of development vary across the study municipalities, the factors are multiple, and the result is paradoxes and disparities.

- **Limitation of financial resources for local communities.** Through field investigations across the municipalities of the study area revealed the weakness of community revenues, leading to difficulties in managing the municipalities, with most of their budgets allocated to employee salaries.

- **Elected councils.** The elected councils represent a fundamental framework in development processes as they reflect the requirements and needs of the population. At the same time, it is easy to involve various stakeholders in mountain development. Local authorities have become key actors in the development and management of local public affairs within the framework of the new perspective of national policy.

It is noteworthy that most local communities in the study area still face internal difficulties related to their nature and composition, such as low educational levels, lack of training in the field in urban and local management, file handling, and convincing various partners and supervisory authorities of the feasibility of proposed projects. In many cases, the role of elected officials is limited to presenting demands that may lack procedural and practical application.



Source: Ali Guzali, Local Development in the Tafraout Region, Kasbah, History, Space, and Development, New Printers Rabat, 2008, p. 2017.

- Weakness of stakeholders' role:

Through our study of various stakeholders in the field under study, we observed that there is a quasi-absent relationship between the different stakeholders in the field, which we illustrate in the following figure:

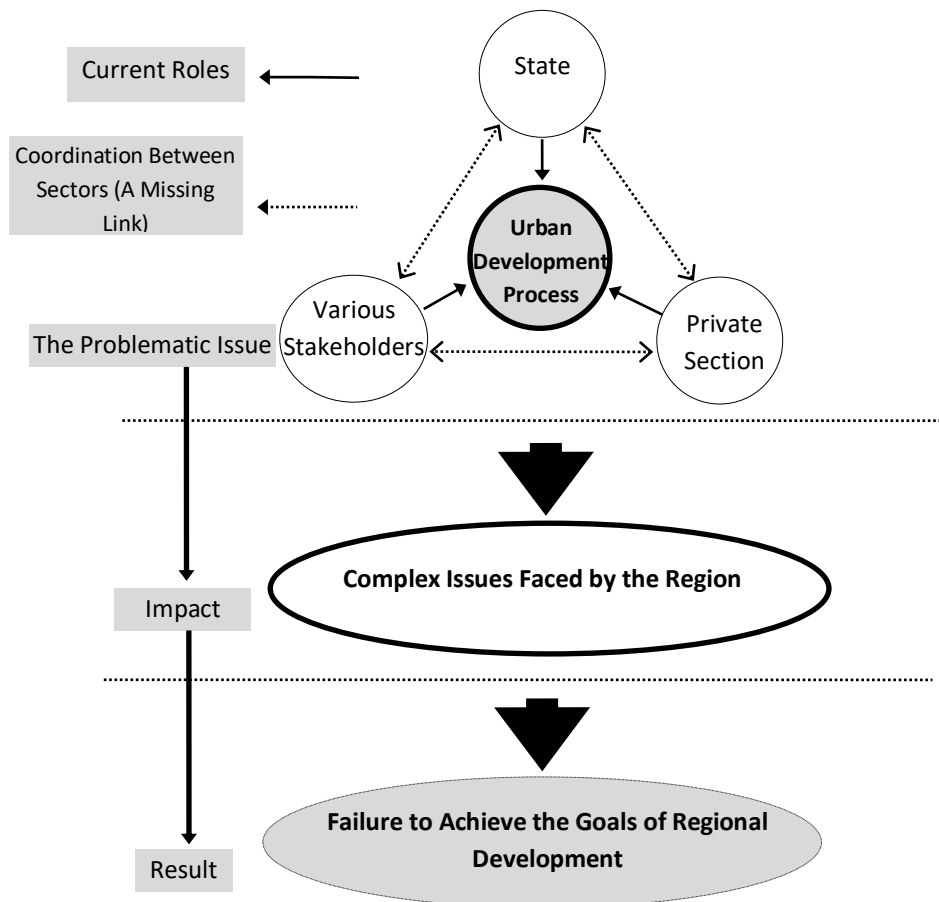


Figure 9. The Impact of Sectoral Disintegration on Regional Development Process.

3. The Impact of resource weakness on secondary clusters of municipalities:

Through field research and visits to various secondary clusters within the study area, the negative aspects can be summarized as follows:

- **Environmental damage.**

The region's Mediterranean climate is characterized by its variability in precipitation due to differences in altitude and geographical location. Consequently, rainfall patterns are irregular in terms of timing and geographical distribution. Over the past two decades, there has been a decline in rainfall, resulting in long periods of drought lasting up to six months, as well as excessive cold spells. These climatic changes adversely affect various agricultural activities and hinder the regeneration of trees, particularly cedar and oak, leading to a reduction in water resources.

- **Fragility of the human environment.**

Demographic growth has intensified the demand for agricultural land and exerted pressure on forests. The scattered residential clusters hinder the establishment of socio-economic facilities in the region. These areas suffer from deficiencies in educational and health infrastructure, particularly secondary clusters. Moreover, property disputes remain unresolved, exacerbating the situation.

- **Weak oversight and forest degradation.**

Illegal logging is prevalent, with a significant portion of timber sales occurring outside official statistics and forest oversight. This illicit activity leads to substantial losses in forest cover and persists despite being unlawful.

- **Pressure on pastures and exploitation disorder.**

Uncontrolled grazing contributes to the loss of biodiversity and ecological imbalance, negatively affecting natural regeneration and the sustainability of pastoral and forest systems. Additionally, unregulated exploitation of pastoral areas and extensive movements of livestock exert pressure on these environments, perpetuating traditional grazing practices.

- **Neglected and subsistence agriculture.**

Traditional agricultural yields are low, mainly relying on subsistence farming, particularly grain cultivation. Farm fragmentation impedes agricultural development, sometimes making parcel subdivisions impractical due to small plot sizes. Furthermore, deteriorating irrigation systems and occasional droughts exacerbate agricultural challenges.

- **Deficiency in social facilities.**

Secondary clusters in the study area lack adequate healthcare, cultural, and sports facilities, resulting in insufficient services. Additionally, some access routes and roads leading to these clusters have deteriorated despite recent development projects.

- **Migration.**

Residents of the mountainous region heavily depend on limited and diverse agricultural activities. However, the limited productivity, harsh natural conditions, and lack of resources in areas such as Abdi Valley and Abiod Valley have spurred rural migration towards urban centers within and outside the province in search of employment and stability.

- **Equipment shortages.**

Basic infrastructure and essential services are lacking, compounded by challenges in housing financing. Political and security circumstances in the recent past have further exacerbated the outmigration of the region's original inhabitants.

- **Road network deficiencies due to rugged terrain.**

Two national highways and various provincial roads intersect the study area. Remote secondary clusters struggle with limited access to main municipal clusters due to the rugged terrain and poor condition of winding roads, particularly in mountainous areas.

- **Weak community movement in mountainous regions.**

Community involvement remains weak in the Aures region, with insufficient training among its members. Given this reality, local actors need to develop community action by drawing on local cultural values to serve local development and contribute to the development of the Aures region.

4- Variation in service levels in the study area: “Secondary Clusters/Municipal Centers/District Centers”

The study area exhibits notable disparities in natural, economic, and social resources and qualifications from one center to another. Consequently, there is clear divergence and inequality among the studied urban clusters in terms of growth and dynamics.

These factors are not the sole contributors to the organizational and urban image of the studied clusters; rather, they result from the interplay of various and diverse factors that have influenced the emergence of these centers in their current state. Based on the survey data, areas of influence were determined according to services and relationships. In rural villages and settlements (secondary clusters of municipalities), ordinary relationships, which were previously focused on housing and limited agricultural activities, were identified. Conversely, primary centers focusing on commerce, such as the city of Arris, exhibit influence areas resulting from relationships established through public administrative services that lack commercial characteristics and are subject to governmental decisions, such as public health, education, and justice services, as well as commercial services characterized by freedom in localization or economic interest, including private clinics, various liberal professions such as lawyers and doctors, architectural and engineering offices, consultancy firms, etc. Additionally, rare services in the region have positioned Arris as the foremost center in terms of services.

Urbanity is not solely defined by population size. While some villages experience significant population growth, others have relatively low populations. The essence lies in the human relationships that distinguish urban from rural life.

Through the study, we gained insight into the variation in service areas in the study region and the connections between centers based on several indicators. This comprehensive analysis enabled us to understand the field's dynamics and highlight the relationship between centers and their local clusters. The service index delineated areas of influence aligned with service hierarchies. Despite being service-oriented, these areas strengthen the role of centers and contribute to their dynamics. Furthermore, services have bolstered the primary city's role in the region (the city of Arris) through its healthcare, administrative services, etc.

Conclusion.

The levels of development in the municipalities of the study area and their relationship with resource constraints have been identified. Our study relied on a hierarchy correlation matrix to understand the reasons for variations in development levels among municipalities and to provide analyses of the findings. Twenty indicators were employed, revealing varied development results across municipalities: Arris Municipality experienced good development, four municipalities experienced acceptable development, three municipalities had development ranging from moderate to weak, and three municipalities had very weak development. There were significant disparities from the highest to the lowest levels of development, attributed to several factors and reasons that contributed to the development of some municipalities while marginalizing others, including:

- The natural factor contributed to the disparity in development from north to south and from east to west, affecting the level of development in municipalities through facilitating factors (climate, soil, vegetation cover, and topography) and obstacles. For example, municipalities like Tkoutt and Ichmoul Arris benefited from facilitating factors, while municipalities like Tigherghar, Chir, and Bouzina faced development obstacles. We observe that facilitating factors increase as we move from south to north within the study area, and from west to east.

- Historical factors played a role in the development of some municipalities; for instance, Arris Municipality has been a district center since colonial times, which influenced its development levels. Conversely, newly established municipalities mostly exhibited weak or very weak development.

- The proximity to or distance from national road axes contributed to disparities in development. Municipalities traversed by these axes have greater opportunities to attract investment and establish better relations with the surrounding clusters. Moreover, when urban centers serve as transit nodes (such as Arris, Teniet Al-Abed, and Mena), secondary centers' proximity to these main urban nodes plays a role in driving development forward. These secondary centers act as complementary nodes to the functions performed by the primary center, benefiting from additional investments. For instance, the clustering of Arris, Mena, and Ichmoul exemplifies this scenario.

- Urban planning and development tools, particularly before 1990, played a significant role. Municipalities existing before 1984 benefited from the primary strategic plan. Under this plan, municipalities, especially their main clusters, received a range of investments in the early 1980s. These investments highlighted disparities and development levels, highlighting the mechanisms through which primary municipal centers were promoted.

- At the end of the 1970s, the state adopted an industrialization policy, which resulted in limited industrial activity in the region, primarily centered on the industrial zone in Arris Municipality and the activity zone in Mena Municipality. This policy led to the establishment of some industrial units within their respective municipal territories, contributing, albeit with a marginal difference, compared to other municipalities.

- At the end of the 1970s, the state adopted an industrialization policy, which resulted in limited industrial activity in the region, primarily centered on the industrial zone in Arris Municipality and the activity zone in Mena Municipality. This policy led to the establishment of some industrial units within their respective municipal territories, contributing, albeit with a marginal difference, compared to other municipalities.

- Administrative divisions led to an increase in the number of study municipalities from 6 to 12 by promoting 5 municipalities to districts. In general, the level of development is often associated with administrative levels. However, this correlation was not evident in Bouzina Municipality despite being a district headquarters, due to its peripheral location and limited resources.

- Within the framework of the state's orientation towards a market economy, economic units emerged, with their distribution varying from one municipality to another. The proximity to transportation arteries and industrial zones in the south led to the establishment of economic units, contributing significantly to the disparity in development levels across municipalities.

Declaration of Interest Statement.

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

1. Ali Guzali, (2008). Local Development in the Tafraout Region, Kasbah, History, Space, and Development, New Printers Rabat.
2. All the master plans for development and urban planning in the study municipalities.
3. Boulhwach Allaoua, (2010). Regional Planning, Fourth Year Printing, University of Constantine 1.
4. DPAT, (2015). Monography of the wilaya of Batna.
5. Ibrahim Al-Turki et al., (2016). Local Development and Sustainable Management of Natural Resources, Rural Areas in Morocco, Research and Interventions, Al-Ma'arif Al-Jadida Printing Press, First Edition, Rabat.
6. Lahcen Fartass, (2014). Economic Social Disparities: The Problem of Balanced Development, a study of the municipalities of the High Plains of Setif, Ph.D. thesis in Urban Planning, University of Constantine 1.
7. Mohamed Shahata Darwish, (1998). Land Uses in the Egyptian City, a Ph.D. thesis in Regional and Urban Planning, Faculty of Regional and Urban Planning, Cairo University.
8. National Center for Studies, Analysis of Population, and Development: «Reform of local finances and taxation».
9. National Office of Statistics, (2011) - First Economic Census in Algeria.
10. Philippe Thiriez, Cherif Merzouki, (1986). Flanant in the Aurès. Numidia Editions, Ain M'lila, Algeria.
11. URBACO, (2008). Development plan for the wilaya of Batna.