International Journal of Innovative Technologies in Social Science

e-ISSN: 2544-9435

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

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ARTICLE TITLE	DETECTION CHANGES AND ANALYSIS OF URBAN SPRAWL IN M'SILA CITY (ALGERIA): CONTRIBUTION OF SPATIAL REMOTE SENSING AND GIS
ARTICLE INFO	Abbas Saliha. (2024) Detection Changes and Analysis of Urban Sprawl in M'sila City (Algeria): Contribution of Spatial Remote Sensing and GIS. *International Journal of Innovative Technologies in Social Science*. 4(44). doi: 10.31435/ijitss.4(44).2024.2947
DOI	https://doi.org/10.31435/ijitss.4(44).2024.2947
RECEIVED	30 September 2024
ACCEPTED	06 December 2024
PUBLISHED	09 December 2024
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DETECTION CHANGES AND ANALYSIS OF URBAN SPRAWL IN M'SILA CITY (ALGERIA): CONTRIBUTION OF SPATIAL REMOTE SENSING AND GIS

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ABSTRACT

Urban sprawl is one of the major problems facing Algerian cities, For almost half a century, urban sprawl, due to its unprecedented scale, has profoundly changed the relationship of cities to space and has given rise to the emergence of new urban forms, The monitoring and understanding of its spatial evolution remain an essential step in any approach to the sustainable development of the steppe city, local authorities do not have appropriate tools, likely to be updated regularly, to enable them to act effectively in terms of planning and spatial development, spatial remote sensing and geographic information systems (GIS) offer opportunities to overcome these difficulties.

The study presented here consists of the application of a change detection technique to map and quantify the spatiotemporal spread of the city of M'sila (Algeria) during the period 1985 - 2023, using Landsat images from the years 1985, 2000 and 2023. The post-classification comparison of land use maps revealed an increase in built-up areas, especially along roads, despite this urban spatial growth, agricultural activities remain visible, which means that there is a competition between urban development and agricultural production areas is therefore evident.

The objective of this study is to highlight the process of urban sprawl and the changes in land use it generates, it shows the importance of change detection methods for understanding forms of urbanization and assessing their impacts on steppe cities.

KEYWORDS

Spatial Remote Sensing, Urban Sprawl, M'sila City, GIS, Change Detection

CITATION

Abbas Saliha. (2024) Detection Changes and Analysis of Urban Sprawl in M'sila City (Algeria): Contribution of Spatial Remote Sensing and GIS. *International Journal of Innovative Technologies in Social Science*. 4(44). doi: 10.31435/ijitss.4(44).2024.2947

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1. Introduction.

Cities grow, expand and spread out on a planetary scale (Véron, 2008), urban sprawl "understood in its essential sense of extension of the territorial influence of cities" (Zaninetti et al., 2007), it is also "a process of significant increase in urbanized areas on the outskirts of cities, which 'generally accompanied by a loosening of populations and urban activities' (Pumain et al., 2006). For almost half a century, urban sprawl, due to its unprecedented scale, has profoundly changed the relationship of cities to space and has given rise to the emergence of new urban forms, built-up area seems to be both diluted and fragmented within expanding territories in a context of generalized mobility of all city stakeholders, in these modern times, urban sprawl is a key issue in a context of very strong growth, on territories that are constantly being swallowed up by buildings. We are more concerned about a contemporary phenomenon which, every day, poses more and more problems in terms of transport, pollution, congestion and the destruction of agricultural land, however, and to meet its own needs, the city grew, due to a lack of available land within its limits, it spreads out. As a result, the city boundary is continuously pushed further and further.

The issue of urban sprawl is at the center of debates on the challenges facing cities in the 21st century, Ritchot highlights the diffuse character of the sprawl by specifying that "the urban as a body, that is to say as a localized material form, draws a stain that grows on a rural substrate" (Ritchot et al., 1994), this diffuse character of the urban gradually and continuously pushes back the limits of the city, urbanization is spilling

over to the outskirts, towns are turning into small towns and city-country boundaries are blurring (Allain, 2004). Other key characteristics appear in the literature on urban sprawl, such as the emergence of new polarities, the decline in density and the development of new residential forms, automobile-related problems, etc. (Galster et al., 2001; Torrens, 2008).

Urban sprawl, which is a process of spatial extension of the city, reflects a galloping process of urbanization, it also marks the urban development in Algeria since the 1970s expressed by an urban evolution of a particular type which breaks with classic urbanization. Over the past three decades, the cities of the Algerian steppe have undergone significant spatial sprawl, the city of M'sila has not escaped from these urban dynamics motivated by socio-economic driving forces generating disproportionate spatial growth, in a context of steppe fragility, urban surfaces have continued to increase, increasingly affecting the steppe landscape and jeopardizing their ecosystems. This contemporary mode of growth is considered to generate nuisances both environmentally and socioeconomically, the apprehension of this rapid and uncontrolled evolution is an essential step in implementing a sustainable development approach for the steppe city.

In this regard, local authorities do not have such relevant tools to control and manage the sprawl of steppical agricultural towns, With the "classic" methods of surveying the inventory and field survey, as well as bureaucratic procedures, planning and town planning documents cannot be put in place, up-to-date with the regularity and speed required to follow the accelerated evolution of the built fabric (Armand, 2016). Better monitoring of spatiotemporal changes requires the effective and permanent updating of information on land occupation and use.

The use of change detection (CD) approaches overcomes these difficulties, these approaches, based on spatial remote sensing and GIS, offer the possibility of monitoring the rapid spread of urbanized surfaces and visualizing the transformations it generates. Change detection methods are mainly based on the multitemporal analysis of satellite images (Gamba and Dell'Acqua, 2016, Skupinski et al., 2009). These, by their temporal regularity and the synoptic views they support, offer the opportunity to regularly update the state of land occupation and use of the territories studied, thus, this resource has become essential for the monitoring and control of urbanization, particularly in developing countries where this phenomenon is more accentuated and the highlighting of these impacts seems less obvious (Armand, 2016; Dureau et al. Weber, 1995).

Based on satellite images, the objective of this study is twofold: on the one hand, to highlight the process of spreading of a large steppe city, that of M'sila, during the period 1985 - 2023, in trying to establish a cartography of change characterizing its spatiotemporal evolution; on the other hand, to quantify this spatial growth in order to realize its repercussions on a city with a pastoral and agricultural vocation, the private gardens and orchards had long forged its identity. The detection of land cover and land use change is one of the main applications of spatial remote sensing (Mas, 2000). This is an approach for comparing multi-date satellite scenes. It consists in highlighting the biophysical change of the ground cover during a given period, through the calculation of the variation of radiance between pixels having the same locations (Mas, 2000; Singh, 1989). Change detection methods mainly rely on spatial remote sensing and GIS for the acquisition, processing and exploration of spatiotemporal data. GIS thus facilitate the modeling and prediction of different scenarios as well as their evaluation. This approach makes it possible to understand the process of urban sprawl through the identification of the various changes in occupation and land use taking place in urban and peri-urban territories. This approach can help local authorities to act effectively in terms of spatial planning, with a view to sustainable development of territories with less impact on the environment (Thériault et al., 2011; Weng, 2007). The purpose of this approach may include the geographic location of the change through a mapping of the change, the identification of the type of change as well as its quantitative and qualitative evaluation (Coppin et al., 2004; Hussain et al., 2013; Im et al, 2005).

Various methods have been developed and adopted for the detection of change. Depending on the approach implemented, these methods can be briefly listed in three categories: (i) algebraic methods, or direct comparison, which are based on the calculation of the radiometric variation; (ii) comparison methods after image transformation and normalization (enhancement); (iii) post-classification methods based on the classification of diachronic images. The methodological choice generally depends on the expected objectives, the heterogeneity of the territory observed, the spatial and temporal resolution of the images used and the knowledge of the analyst (Hussain et al., 2013; D Lu et al., 2004; Mas , 2000).

2 Methods and Data.

2.1 Study Area.

The city of M'sila constitutes the capital of Hodna region, in the heart of one of the largest sets of semi-arid and steppe area that exist in north Africa (Despois, 1953; Sebhi, 1987; Boutabba, 2013). This region is set back from the southern coasts of the mediterranean between the Tellian Atlas to the north and the Saharian Atlas to the south (Fig. 1), historically, M'sila was a town with a pastoral and agricultural vocation, private gardens and orchards had long forged its identity.

M'sila is a medium-sized city (236 913 inhabitants in 2023), it is located on the northern edge of the steppe, at 250 km from the capital Algiers, it is characterized by a strategic geographical position, crossed by the RN40 (M'sila - Batna, Biskra - Setif), the RN60 (M'sila - Algiers) and the RN45 (M'sila - Bordj Bou-Arreridj and Bou-Saada), it is an ideal crossroads of exchange linking the North to the South, and the East to the West, it is limited, on the North side by the municipality of El Ache (Wilaya of Bordj-Bou-Arreridj), on the south side by the municipality of Ouled Madhi, on the east by the municipality of Metarfa and on the west by the municipality of Ouled Mansour.

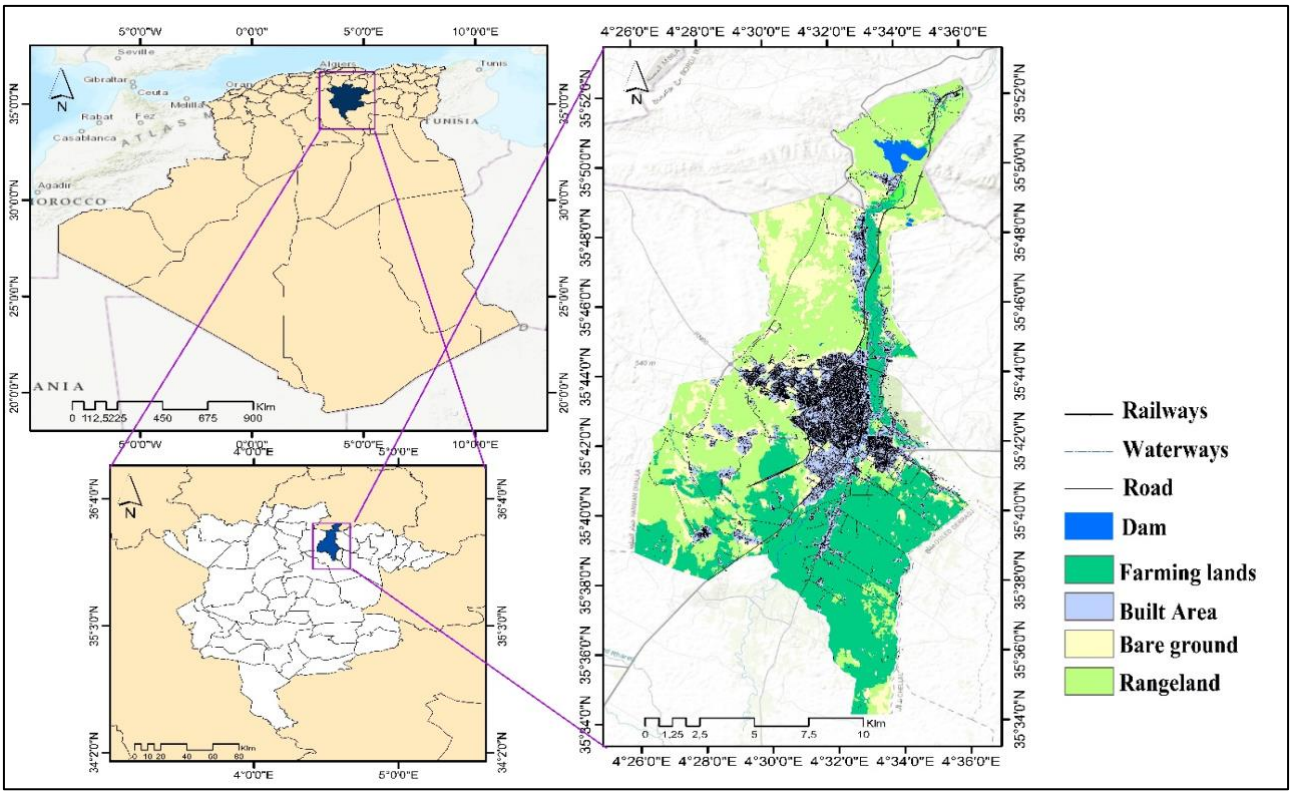

Fig. 1. Location of the city of M'sila (Treated by arc gis 10.8 proj: UTM84 zone 31)

The northern part of the municipal area is the feet of the mountains of the Hodna mountain range and the mountains of Maadid, and in the south are depressions, which are vast plains that form Shott Hodna. M'sila Municipality area is 233 km2, it characterized by medium heights located in the north (600 m to 800 m), and low areas in the south (600 to 400 m), it is characterized by a dense hydrographic network, the slope takes a north-south direction, the category between 0-10% includes the urban areas of the city of M'sila.

2.2 Methodology.

2.2.1 Data Processing.

The study consists in characterizing the evolution of the urban sprawl of M'sila city over a period of 38 years, between 1985 and 2023, the period during which urban sprawl seems more significant. To do this, a sequential series consisting of three Landsat multispectral images was acquired through the USGS (United States Geological Survey) (Table 1). The acquired images correspond to the following years: 1985, 2000, and 2023. These three satellite scenes are selected for their temporal similarity (scenes taken during the same

seasons of the year and at very close times) to ensure better similarity in terms of atmospheric and phenological conditions (Coppin et al., 2004; Dengsheng Lu and Weng, 2007).

Table 1. Characteristics of Landsat images used

Picture	Sensor	Date	Bands	Cloudiness	RMSE (m)	Res. spatial (m)
Picture 1	Landsat 5 TM	24-11-1985	1-2-3-4-5-7	0	4 416	30
Picture 2	Landsat 7 ETM+	08-10-2000	1-2-3-4-5-7	0	4 148	30
Picture 3	Landsat 8 OLI-TIRS	21-10-2023	1-2-3-4-5-6-7	0	6 786	30

Three Geotiff images (1985 - 2000 - 2023) provided in natural color by the USGS are used, the use of these images makes it possible to identify the areas located outside the urban perimeters and not covered by the parcel plans. The processing chain (classification and post-classification) of satellite images is carried out using ArcGIS software (Congedo, 2016; Leroux et al., 2018).

2.2.2 Methodological Approach.

The approach followed in this study is structured in four stages: (i) preprocessing and normalization of the acquired images; (ii) a classification and post-processing (refreshing) procedure, (iii) assessment of classification performance, (iv) post-classification comparison of the thematic maps generated at the end of the classification (Ban and Yousif, 2016; Dengsheng Lu and Weng, 2007; Nath et al., 2014).

i. Image pre-processing and normalization

The images selected for this study (collection of L1TP levels) are geometrically self-rectified and geocoded prior to their release by the USGS, according to the WGS 84 Zone 31 North geographic referencing system. The standard RMSE (Rout Mean Square Error) estimate revealed a negligible level of error (less than 0.23 pixels). The superimposition of the images is visually checked. The study area is extracted through a cutting window including the current urban perimeter as well as its peri-urban environment.

A radiometric calibration is thus performed by performing a TOA (Top Of Atmospheric) type atmospheric correction and a subtraction of unattributed objects by applying the DOS1 (Dark Object Subtraction) model (Congedo, 2016; NASA, 2011; Tucker et al., 2004). Subsequently, an enhancement of the images is applied in order to improve their quality and at the same time facilitate their visual interpretation. A composition colored in false colors was retained with the combination of the bands (4-3-2) for the TM and ETM+ images and (5-4-3) for that of Landsat 8 (Fig. 2). This composition, after several others, showed better discrimination of the surfaces and objects constituting the different types of land use (Collet and Caloz, 2001; Jensen and Lulla, 1987).

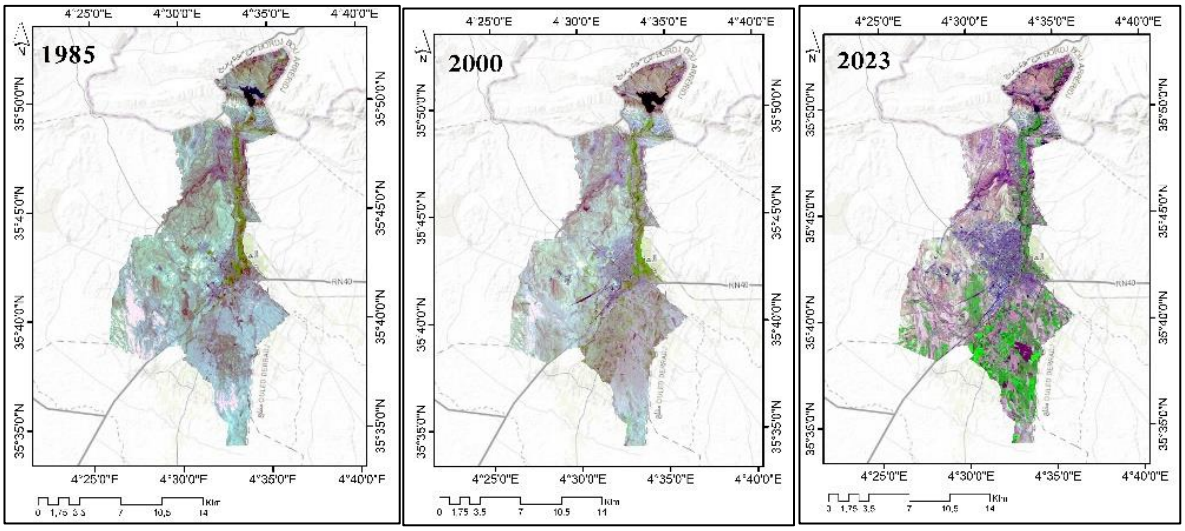

Fig. 2. False color compositions of the images used (1985-2000-2023)
(Treated by arc GIS 10.8 proj: UTM84 zone 31)

ii. Classification and post-processing

Satellite data classification is an effective method for extracting spatial information. It consists of assigning to each pixel its affiliation in terms of land use. In this study, a supervised type classification was initiated (Girard and Girard, 2010; Dengsheng Lu and Weng, 2007).

Based on reference documents and knowledge of the terrain, four land use classes are defined: urbanized areas (Residential constructions, commercial and service, tourist and industrial complexes, activity area, lanes, mixed urban areas), vegetation area (meadows, arboriculture and agricultural soils) and bare soil (bare ground, rocky outcrop) (Table. 2). The sampling of the training zones (test zones) is established by photo-interpretation of the images in colored compositions, in correspondence with the reference maps (Du et al , 2014; Im and Jensen, 2005; Munafò and Congedo, 2017), polygons representative of different classes are generated through the "region growing" algorithm which consists of creating, from a starting pixel, a homogeneous region including pixels with similar spectral properties (Congedo, 2016; Rajendran and Mani , 2015).

The analysis of spectral distances revealed some overlaps, particularly between the bare ground class and that of buildings. To resolve this anomaly, we multiplied the subclasses at the level of the confusion zones with the application of automatic thresholding allowing their spectral separabilities (Congedo, 2016; Sezgin and Sankur, 2004).

Table 2. Characteristics of Landsat images used

Class number	Label	Description
01	Built-up area	Residential constructions, commercial and service, tourist and industrial complexes, activity area, lanes, mixed urban areas.
02	Vegetation	Meadows, arboriculture and agricultural soils.
03	Bare ground	Bare ground, rocky outcrop

Supervised classification was carried out by running the "Maximum Likelihood" algorithm (Dengsheng Lu and Weng, 2007; Mather and Tso, 2016; Nath et al., 2014; Phiri and Morgenroth, 2017). Subsequently, post-processing improvement of the maps generated by the classification is initiated. It consists of correcting the confusion induced by the classification and elimination of isolated pixels by applying a 3x3 pixel filter.

At the end of this step, a reclassification treatment is applied to the three maps in order to make them homogeneous and comparable (Dengsheng Lu and Weng, 2007). The subclasses of bare soil are grouped into a single class, the same for those of urbanized areas. Regarding vegetation, we have distinguished two classes: arboriculture located within the sides of K'sob valley, and the cropland, which corresponds to new agricultural operations on the outskirts of the city. This reclassification will allow the visualization of the spatiotemporal evolution of the palm grove inside the city separately from that occurring on the outskirts.

iii. Performance evaluation: the confusion matrix

The evaluation of the classification is crucial to be able to carry out the thematic analysis. It provides information on the level of precision of the maps produced by the classification. There are several methods of assessing classification; the most common is the confusion matrix (Congalton, 1991).

A synthetic index from the confusion matrix is also used in the precision assessment. This is the Kappa (Khat) index. It is a quality indicator used to measure the performance of a classification through the examination of all the elements constituting the matrix (Congalton, 1991; Stehman, 1996).

This method of calculation allows obtaining a reliable evaluation of the level of precision of the classification, unlike the first index which is more global and whose calculation is focused only on the elements of the diagonal (Collet and Caloz, 2001). For a Khat value greater than or equal to 0.8, the classification is statistically considered acceptable; whereas if the Khat varies between 0.4 and 0.8, the classification is considered of average quality (Congalton and Green, 2008; Landis and Koch, 1977).

In this study, the evaluation of precision is carried out by firstly digitizing 200 control points, created and distributed randomly throughout the study area and covering all classes, then, secondly, by recording real data from photo-interpretation of reference maps. The confusion matrix is subsequently generated from the comparison matrix calculation (SIG).

iv. Change detection and calculation

During this step, the thematic maps generated at the end of the classification are subjected to a post-classification comparison operation. The objective of this analysis is to visualize and describe the process of spreading the urban sprawl of the city of M'sila through the identification of different changes in land use. Two temporal intervals are nuanced: 1985 – 2000 and 2000-2023.

The result for each period is a change map supplemented by a descriptive report. On the change map the unchanged surfaces and those converted during the period concerned are located; the descriptive report quantitatively illustrates the evolution of each class by indicating the nature of mutation (change from one class to another).

3 Results and Discussion.

3.1 Classification Validation.

The confusion matrices generated for these three maps showed a satisfactory level of precision, both for the overall precision and the precision of the classes (Table 3), particularly those of urbanized areas. The Kappa index (K_{hat}) thus showed an acceptable level of precision with values 0.81, 0.90 and 0.91 for the years 1985, 2000 and 2023 respectively.

Table 3. Classification accuracy of the three images 1985, 2000 and 2023

Type of assessment	1985	2000	2023
Overall accuracy (%)	**91,01**	**94,87**	**98,68**
Accuracy class "urbanized surface" (%)	**92,20**	**97,85**	**98,75**
"Vegetation" class accuracy (%)	**96,00**	**97,10**	**98,60**
K_{hat} Index	**0,81**	**0,90**	**0,91**

Source: Author calculation

It should be noted that this evaluation revealed some erroneous but negligible results, corresponding to certain classification confusions between bare ground (of a stony nature) and built-up area.

3.2 Mapping of Change: A Remarkable Urban Sprawl.

The detection of change led to the obtaining of spatiotemporal mapping (Fig. 3) illustrating the evolution of the city of M'sila between 1985 and 2023. The first diachronic reading of the three maps shows a clear growth in urbanized areas. Visual comparison of changes, limit their real appreciation and encourages misjudgment (Tonyé et al., 1999). Therefore, in addition to the visual method, it was confirmed using two other relative approaches. It is important to mention that most of the sprawl measurement techniques, in general, are relative measures, and can be used as indicators of sprawl by the analyst (Bhatta, 2012).

Two quantitative methods for estimating the built-up area: The first method is to estimate the surface by manual delineation, this method was carried out under ArcGis 10.8 (ESRI) software, a polygon can trace our study area and then measuring and calculating perimeters and surfaces, the second method obtained by automatic extraction of pixels, then multiple the number by spatial resolution of the scene pixels, this is the most reliable and most accurate method because it neglects all undeveloped areas within the urban fabric.

Statistically, the surface of the city increased from 1405,98 ha in 1985 to more than 1989,26 ha in 2000, either rate of evolution of 141.48%, to more than 4048,4 ha in 2023.

That is to say that, on average, M'sila city needs 89 ha every year for its extension. Results reveal that land development on global (7.87%) is more than two times the population growth (3.86%). Indeed, urban growth before 1990 is a logical response of a demographic growth marked the first two decades of independence (from 35 377 inhabitants in 1966, to more than 82877 in 1987). It was accompanied by national policy based on the principle of „Economy planned" and „industrializing industry" which involved a considerable increase in urban system of the city.

After 1990, by displacement of the rural population to the city, (from 82877 inhabitants in 1987, to more than 123059 in 1998) because of security conditions that Algeria has known in the 90s (whether a population growth rate of 2.3%), and the release of land market, characterized by the appearance of new actors in land management (private owners), a major redistribution of human workforce operates in the city, causing an extensive consumption of peripheral grounds, situation since a few years began to present signs of urban saturation under the influence of urban sprawl.

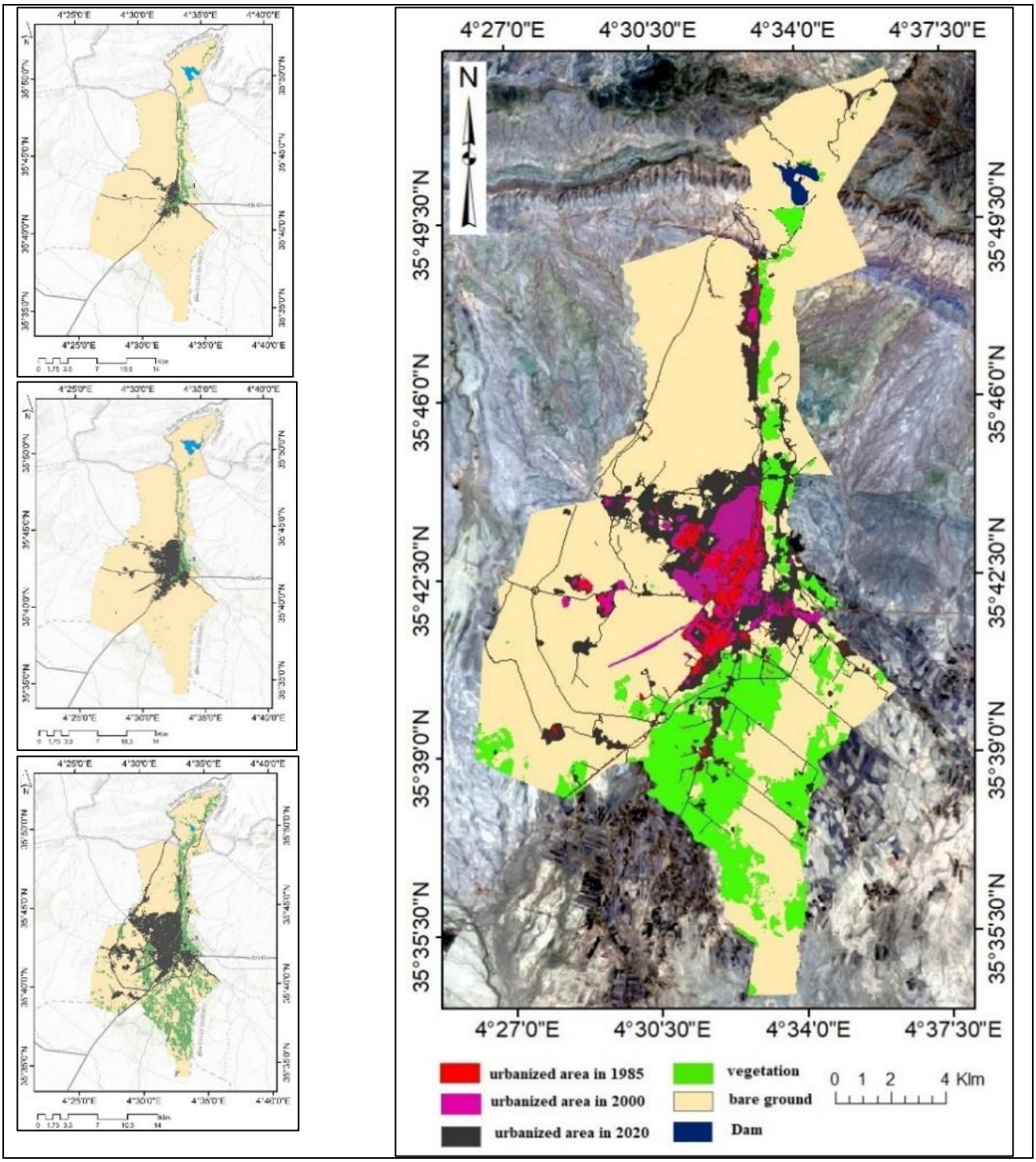

Fig. 3. Spatiotemporal evolution of built-up area class in M'sila (1985–2000-2023)
(Treated by arc GIS 10.8 proj: UTM84 zone 31)

Spatially, the extension of the urban task took place in three directions: towards the west and the northwest, along the road axes, in particular the RN° 60 and the RN° 45, where the beginning of crossing of the municipal boundaries is noted on the territory of the municipality of Metarfa, towards the east, beyond the wadi of K'sob. Along this last direction, a process of urban conurbation is observed, particularly during the period 2000 - 2023. Despite this urban spatial growth, agricultural activities are in growing also, not only around the urbanized space but also within the urban perimeter itself, especially in the eastern and northeastern part of the city. This situation reflects the confrontation of the city with its surrounding rural environment in terms of the use of space.

It is therefore a question in this confrontation, on the one hand of giving the urban character to the spaces integrated into the city and on the other hand of the maintenance of agricultural activities in these integrated spaces. which means that there is a competition between urban development and agricultural production areas is therefore evident.

Table 4. Evolution of the area of M'sila city in 1985, 2000, and 2023

Year/ Sensor	Area by manual delineation (ha)	Area auto-extraction	Percentage of built-up (%)
1985 TM	1405,98	1043,87	4,476236545
2000 ETM	1989,26	1577,8	6,765790779
2023 ETM+	4048,4	3918,5	16,80298591

Source: Author calculation

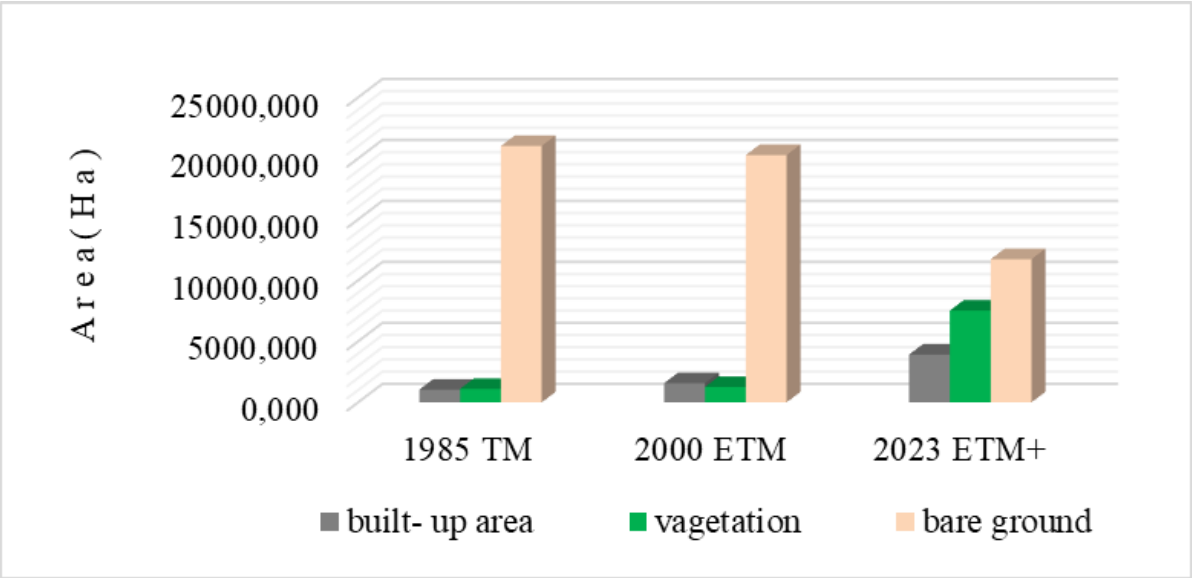

Fig. 4. Evolution of surface portions of land use classes (1985 - 2023)

During the first period, the built class recorded an increase in its surface area. It increased from 1043,87 ha in 1985 to reach 1577,8 ha in 2000 with an increase of 533,93 ha, an annual increase estimated at 35.60 ha, as for the second period (2000 – 2023), the change in land occupation and use continues, but with a variation in magnitude. The building class showed a more accelerated evolution compared to the first period. It integrated more than 2340,7 ha to reach 3918,5 ha of footprint in 2023, an annual increase of around 101,77 ha (compared to 35,60 ha/year during the period 1985 – 2000) (Fig. 3).

The strong growth of its demography as well as its continual migratory attractiveness have resulted in rapid and considerable urban growth. This dynamism of M'sila is all the more important today as the city is both the capital of the wilaya and the Hodna region and by its strategic position as a relay city between its agglomerations and the cities of the North- east on the one hand and those of the south-west of the country on the other.

The analysis of the plan of the city of M'sila makes it possible to distinguish that the general physiognomy of the city is characterized by an oil stain extension, following the two structuring road axes, which cross it from the East to the West and North to South.

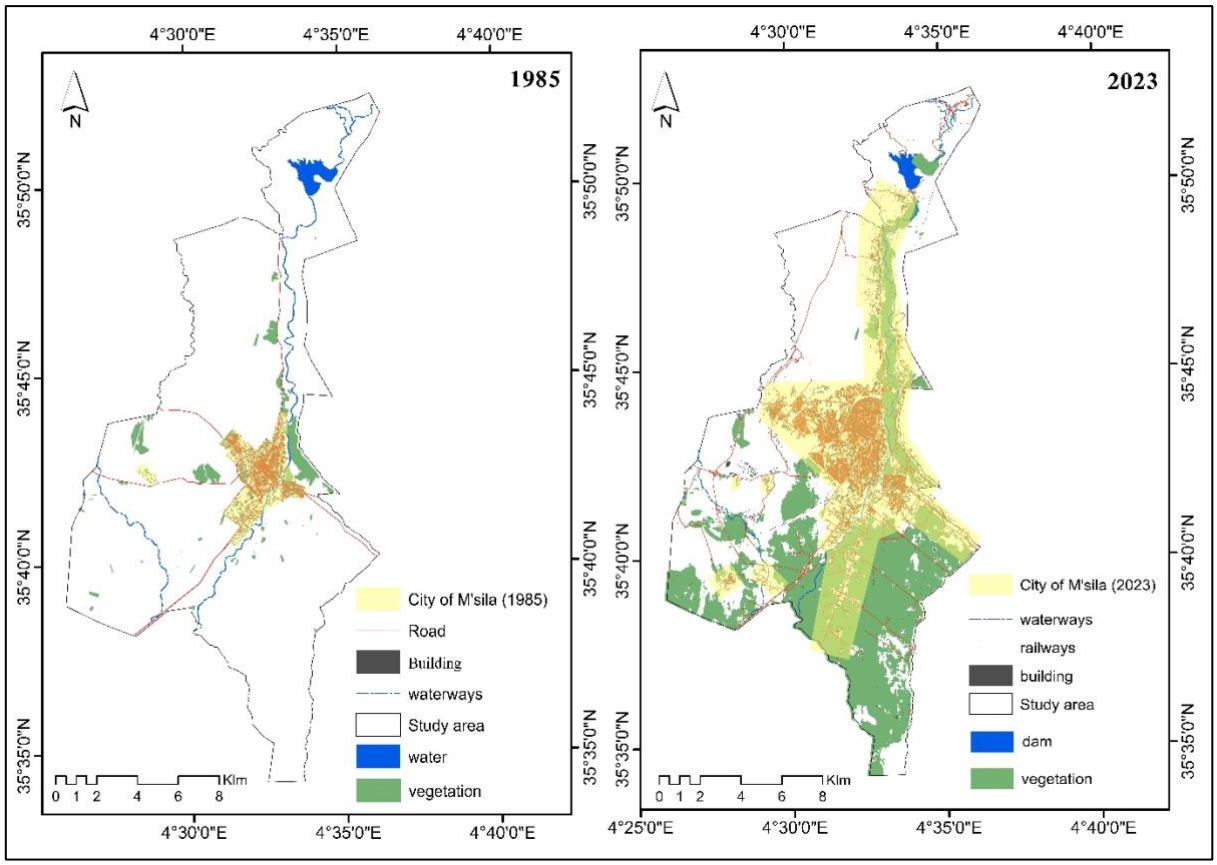

Fig. 5. Forms of growth of M'sila city in 1985 and 2023
(Treated by arc GIS 10.8 proj: UTM84 zone 31)

The main types of urban fabrics that result is: traditional fabric characterized by high density, with a sinuous layout, narrow street, "low" construction (R+1) at most, covered with a flat roof, representing the initial core and origin of the town of M'sila. Old fabric (colonial fabric) with a regular pattern characterized by less dense than the first, with regular geometric shapes in the west of the first fabric. Spontaneous fabric located mainly on garden plots in the old fabrics or on the outskirts of the city, characterized by traditional constructions, whose geometry is irregular and narrow streets. Recent fabric constitutes the extensions of the city of M'sila characterized by regular layout, and road axes perpendicular to each other forming regular geometric shapes, located mainly in the NUHA (new urban housing areas).

The evolution of the city of M'sila has experienced two forms of spatial spread, the first is the result of a fragmentary and involuntary extension results from the extension of the constructions from the progressive filling by juxtaposition of the constructions one in relation to the other. Hence this logic of layout which is essentially produced on the East side (to the detriment of the gardens) and West of the city (on state owned land) has allowed the emergence of new mechanical traffic lanes which differ from the old pedestrian alleys like those in traditional neighborhoods. The second evolution towards its outskirts of the city as a whole towards its periphery, this extension is much more channeled in an East/West direction but what is remarkable is that the extension is done at through the main roads towards Barika, towards Algiers and towards Bordj Bou Arreridj.

The urban sprawl of M'sila knows roughly two phases to be related to, on the one hand the dynamics of land occupation and on the other hand the political and socio-economic evolution of the city. Essentially marked by urbanization in all directions and following the main roads, the first corresponds to the first enlargements of the urban patch. During this period, three elements facilitated the development of the city: the early appropriation of urban life by the nearby rural world, the development of industry and the transport network and the ease of access to land.

From 1985 to 2023, the urban population was multiplied by almost 4, going from 65805 inhabitants to 236913 inhabitants. This period is particularly marked by the massive influx of rural populations to the cities in search of work, After the phase of the implementation of the first strategies for the rationalized national

management of urban growth in the reorganization of the land reserves in 1974, and the development of a first Master Plan for Urbanism (PMD) in 1979, Its execution had two main consequences: the reinforcement of the existing framework and the start of an unprecedented demographic boom. It was followed by a second plan (PDAU) in 1995, the aim of which was to control land, urban planning and forms of management and production of space. However, these two plans were not enough to control the growth of the city, which took on increasingly spectacular appearances, hence the implementation of several other strategies for the development of urban space. This second phase is accompanied by a clear upheaval in the logic of occupying space. While in the first, the locations were made according to a logic of linear occupation dictated essentially by "the economy of road agglomerations" (J.F. TROIN, 1971), in the second, almost no direction is spared. The available space becoming more and more rare, the city sees its initial fabric stretching in all directions along the main roads benefiting from the almost flat site and thus giving the shape of the city a sprawling appearance, Thus, we move from a logic of axial growth to a logic of aureolar extension.

M'sila is one of the largest cities in the region of Hodna, it is the capital which has the most of the economic activities, which has earned it, for several decades, a massive influx of people. The growth of M'sila since 66 is rapid (about 4.6%) this is mainly due to migratory flows (S. SEBHI, 1987), at first, M'sila experienced relatively low urbanization. The construction of the industrial zone, with new installations of national scope attracted the inhabitants and allow the city to become a big city, completely distinct from the rest urban agglomerations adjacent.

4 Conclusions.

The urban spatial growth of M'sila is the result of a long process that took place through agglutination and outward projection, the development of the city took place in a "spot of oil", that is to say a development by progressive contagion of the area which surrounds it, the history of this growth shows that some of the surrounding villages and their lands were swallowed up and became neighborhoods of the city. This city has experienced urban growth which has led to a spatial development which has taken place in the direction of peripheral villages, especially on the West and North-West sides, gradually integrated into the urban space (Bechilga, Mezrir, Sidi Amara, Mouilha, etc.), M'sila by developing has made the agricultural spaces of the absorbed areas disappear, fields have been destroyed to make way for city and large masses of collective housing.

Despite this urban spatial growth, agricultural activities remain visible not only around the urbanized space but also within the urban perimeter itself, especially in the eastern and northeastern part of the city, this situation reflects the confrontation of the city with its surrounding rural environment in terms of the use of space, The privacy in this urban expansion is, on the one hand of giving the urban character to the spaces integrated into the city and on the other hand of the maintenance of agricultural activities in these integrated spaces, therefore the competition between urban spawl and agricultural areas is evident.

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