Monitoring and Evaluating the Progress of Land Use to Predict the Success of Future Lanusse Occupation Plans (LOP). An Approach for Future Urban Management: Case of Batna City-Algeria

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Abstract

The Algerian city was and is still in the experimental stage because of policy makers' decisions and urban actors which affect land use urban projections. The scenario of the regeneration of the Algerian city was subjected to many processes of contrast of land uses, till it became incomprehensible and unsatisfactory in terms of urban terms and living conditions, despite the many efforts, legal and technical planning, and political statements to improve and correct the current situation of our cities, through different mechanisms including an urban master plan (UMP) and the land use occupation plans (LOP). However, all previous plans fail to keep up with the reality of the urban areas' changes, which lead to a rethink again in a new tool and approach to solve our "critical urban situation".

This research paper aims to assess and measure the ratio of implementation of LOP, by measuring major land uses of the existent and the proposed land uses provided by LOP in different periods (2003-2036), at the same time, adopting land use indicators and the current urban dynamics which result to predict the possibility of their application in the future. This approach is tested in Batna city-Algeria-, LOP number UA11, which is a small sample of a generalized problem, its result can contribute to solve an urban issue.

Keywords: Land use, Urban, predict, Batna.

INTRODUCTION

The Algerian city was and is still in the experimental stage because of the policymaker's decisions and the urban actors which affect land use urban projections (Chibani 2015;Hanane 2017; Rachid Sidi Boudienne 2013). The scenario of the regeneration of the Algerian city was subjected to many processes of contrast of land uses, it became incomprehensible and unsatisfactory in terms of urban terms and living conditions, despite the many efforts, legal and technical planning, and political statements to improve and correct the current situation of our cities, through different mechanisms including an urban master plan (UMP) and land use occupation plans (LOP). However, all previous plans fail to keep up with the reality of the urban changes, which lead to a rethink again in a new tool and approach to solve our "critical urban situation" (LAHMAR 2021; Akakba and Lahmar 2020; Fatiha and Belkacem 2017; Lahmar, 2017).

This research paper aims to assess and measure the ratio of implementation of LOP, by measuring the major land uses of the existent and the proposed land uses provided by LOP in different periods (2003-2036), at the same time, adopting land use indicators and the current urban dynamics which result to predict the possibility of their application in the future. This approach is tested in Batna city-Algeria-, LOP number UA11, which is a small sample of a generalized problem, because it represents a critical reading of the extent of application and efficiency of the programs of these plans by adopting the geographical information system, due to its chaotic feature with dominant residential use with the marginalization of the rest of the Land uses. Also, it is a sample of uncontrolled urban expansion, where it benefited from the land occupation plan in 2002, and was reviewed in 2016 for its non-application and discrepancy in its programmed and current spatial uses.

Study Area

The study area (LOP UA11) is one of the city's expansion area in the short and medium period (5 to 10 years) in its eastern side (DUAC 2012), and a sample of the succession of many regulatory programs without the control the growth of the 5th largest city in the country (La Direction Technique Chargée des Statistiques Régionales 2008; Office national des statistiques 2011), where it benefited from the land occupation plan in 2002, within the framework of the directives of the urban master plan for preparation of 1998. It was reviewed in 2016 due the fail of applying his directives within the deadlines, which caused a spatial and functional issues in the entire city.
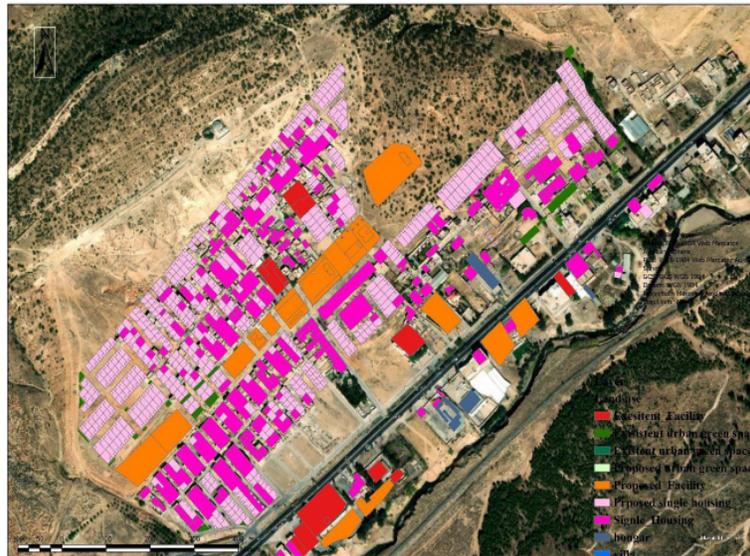
Figure 1. UA11 LOP current situation

Location and General Characteristics

LOP UA11 is characterized by a strategic location as it is a main neighbourhood from the eastern side of the city of Batna, and the extension of the city along National Road No 3 . The LOP UA11 is limited by:

• From the north: the municipality of Fisdis

• From the east: Wadi Qarzi

• From the west: a forest

• From the south: Batna city

The total area is estimated at 51.60 Ha. A generally flat topography (3%-5%), geotechnically suitable for construction with 100 % private property estate ownership, which is directly contributed with the lack of commitment to the application of urban laws (UMP and LOP) (Louhi 2009). The population within UA11 are 1059, originally descend from the neighbourhoods of the main city (Batna) with a low population density estimated at 21 people per hectare as a result of the modernity of reconstruction at its level. The nature of spatial consumption is predominantly residential, with an individual housing pattern of 31.75 % of the total area, followed by 28.23 % of empty areas, also, the equipment and facility represent only 1.98 % of the total area, which made it an area does not serve itself but is functionally affiliated to the city of Batna.

Table 1. Land uses in the study area

Nature of Use		Units	Area (Ha)	Ratio %
individual housing	Existing	325	13.38	31.75
	In the process of completion	93	0.92	
	foundations	35	5.81	
	Subtotal housing	453	20.11	

equipment		5	1.26	1.98
investment facilities		12	2.27	3.58
warehouses		11	0.84	1.32
ways		/	6.57	10.37
Protection trench within the outline perimeter		/	0.95	1.5
valleys		/	1.11	1.75
orchards		/	0.78	1.23
empty area		/	17.88	28.23
the total			51.6	100 %

Source: UA11 revision Year 2016

Although it is a important field for the expansion of the city, it is threatened by the chaotic (Chibani 2015), and unstructured spread, despite its benefit from plans that control building rights and the spatial and spatial distribution of various urban functions.

METHODS AND TOOLS

This research paper relies on the statistics approach, which mean collecting, analysing, presenting, and interpreting data. The collected statical data is based on three major land uses: housing, facilities and urban green areas, wear ease, every single major land use is divided into two groups represents minor land uses: existent land use in 2020 and proposed land use that should be achieved by 2030. Those subgroups are based on timeline schedule of the Urban master plan (UMP) guidelines and policymakers' decisions (See the following figure).

The proposed approach is suggesting to compare between the existent land uses for the 2003, 2016 and 2022; and the proposed configuration program of UA11, the error deviation of % of fails is calculated as:

Equation SEQ Equation * ARABIC 1. The error offset formula based on land use

Err offset = Existent Landuse current Period – Prposed Landuse last period.

All surfaces are gathering from the following table.

Table 2. Usage comparison for the year 2016 And the current one (2022) with the initialization program proposed ithe previous plan

Suggested Programs in the UA11Year 2003	The Current Situation in the Revision of the UA112016	The Current Situation in 2022
Individual housing 612 dwellings	Not done according to plan	
Semi-collective housing 72 dwellings	not accomplished	vacant area
Health center	not accomplished	Single accommodation
Primary School	Exists with an area of 0.2 ha	
The mosque	present with an area of 0.1 ha	
public garden	Not done	Single accommodation
Medium	It has not been completed and the nature of its use has been changed to a mosque with an area of 0.02 hectares	
Postal branch	not accomplished	empty space
green areas	Not done	empty space

Source. UAP11 rapport and author on filed observations.

Also, the following table shows the proposed and existent land uses in different period based on UA11 report, UA11 revision report and on field observation and non-publish local government report.

Table 3. Major and minor landuse tota area

Land use surface (Ha)	2003	2016	2022	2030
Existent Housing	4.6	13.38	15.83	32.12
Proposed Housing	/	18.74	18.74	/
Existent Facilities	0.1	4.53	4.53	12.22
Propped Facilities	/	4.5	6.69	
Existent Green Areas	0	0.78	2.23	12.33
Proposed Green Areas	23.3	11.55	11.55	/

RESULTS AND DISCUSSION

The housing function is dominant in the study area, as its area has increased five times since the year 2003 to 2016, from 4.6 Ha e to 20.11 Ha, due to the speed of reconstruction in the field as a scope for the future expansion of the city along Road No. 03.
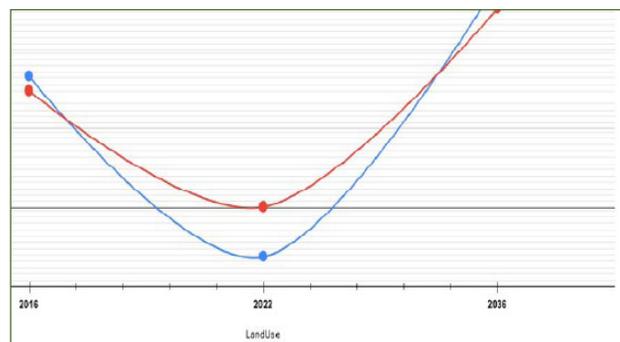
The catalyst for this is for this area to remain relatively stable until 2022, this ratio was not accompanied by a parallel ratio in the exploitation of facilities (utilities and equipment), which recorded a very weak rate. As for green and free spaces, they are still completely non-existent.

Table 4. Landuse offset in UA11 LOP between 2003-2036

Land use	2016-2003 Offset		2016-2022 offset		Expected 2030	
	%	Ha	%	Ha	%	Ha
Housing	41.66	13.38	-15.53	-2.91	71.4	13.38
Facilities	37.07	4.53	0.25	0.03	63.18	7.72
Green Areas	-182.64	-22.52	-75.59	-9.32	6.33	0.78

We should mention that from 2016-2022, both land use housing and facility are decreased significantly because of Austerity in the state budget in the form and management of expenditures.

CONCLUSION

The accelerating ratio low to 2016 for residential use, compared to other land uses due to the lack of control over the spatial organization and the pace of spontaneous reconstruction in favour of meeting housing needs. The basic and necessary facilities and requirement exceeded the validity of planning and cancelled adherence to the plan, because of the economic situation of the country and the health of the world as a whole (COVID-19), which reduced funding sources and affected individual income and thus urban production, whether public (the state) or private (individuals) in addition to a noticeable rise in the price of urban real estate imposed by the transition from a rural area to an urban one (That is, the goal of 2022) , so that a fundamental question arises, what will be the fate of the reconstruction of the field in the future, at the current pace and the available data?

Arar neighbourhood has benefited from the eastern expansion of the city from the land occupation under No. UA11 which I started studying it in 2003 However, this LOP was not implemented within its specified deadlines (short and medium term) for several reasons, the most important of which is the nature of private real estate ownership, which

facilitated customary buying and selling at low prices due to the lack of real estate market controls and the creation of a real estate portfolio that allows the acquisition of land for the establishment of public facilities of public interest. On the one hand, and due to the heavy burdens of the legal procedures accompanying these operations financially and temporally, on the other hand, in the absence of strict monitoring mechanisms for construction operations in the face of the urgent need for housing on the part of the citizen and the inability of the state to provide it or to Stopping its chaotic spread, which necessitated its review in 2016 According to the applicable legislation (described previously).

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Competing Interests

The author(s) Fatiha SAMAI, and Amireche Hamza declare that they have no competing interests.

REFERENCES

1. Akakba, Ahmed, and Belkacem Lahmar. 2020. "The Use of Geocoding for Home Healthcare Application and Management an Epidemic Situation: Case of COVID-19 Virus Outbreak." Geographica Pannonica 24 (4): 285–93. https://doi.org/10.5937/gp24-28062.

2. Chibani, Kamel. 2015. Si BATNA métait Contee 1844-1962. A.Guerfi.

3. DUAC. 2012. Plan Directeur daménagement et durbanisme Inter-Commmunale.

4. Fatiha, Samai, and Lahmar Belkacem. 2017. Evaluation De La Desserte Spatiale Des Etablissements Publics De Santé De Proximité - Approche Par Les SIG- Cas La Ville De Batna-ALGERIE. In 4e Colloque de l'AFGP Villes Durables: Milieu Physique et Gouvernance Territoriale Tanger, 4. AFGP.

5. Hanane, BETTOUATI Hanane BETTOUATI. 2017. "REFLEXIONS AUTOUR DU CONCEPT DE GOUVERNANCE TERRITORIALE." REVUE ALGERIENNE DE FINANCES PUBLIQUES 7 (1): 55–69.

6. La Direction Technique Chargée des Statistiques Régionales, l'Agriculture et de la Cartographie. 2008. "Collections Statistiques N° 163/2011 Série S : Statistiques Sociales Armature Urbaine - RGPH 2008 -." Office National des Statistiques. http://www.ons.dz/IMG/pdf/armature_urbaine_2008.pdf.

7. LAHMAR, Belkacem. 2021. "Analyse de La Fonction Sanitaire Dans La Ville de Batna Dans Une Perspective de Gestion de Crise Majeure. Approche Par SIG." Doctoral, Université de Batna 2. http://eprints.univ-batna2.dz/1921/.

8. Lahmar, Belkacem. n.d. "Territorial Health Approach Outputs of Geo-Governance of Health Facilities: Case Study of Batna, Algeria."

9. Louhi, Djegheri. 2009. "La Ville Algérienne, Les Prémices d'une Gouvernance Locale. Site de Référence : Annaba." Sciences & Technologie. D, Sciences de La Terre, no. 30 (December): 53–70.

10. Office national des statistiques. 2011. "ARMATURE URBAIN." Collections Statistiques N: 163/2011 Série S : Statistiques Sociales. La Direction Technique Chargée des Statistiques Régionales, l'Agriculture et de la Cartographie. http://www.ons.dz/IMG/pdf/armature_urbaine_2008.pdf.

11. Rachid Sidi Boumediene : "L'urbanisme en Algérie échec des instruments ou instruments de l'échec", les alternatives urbaines Alger, 2013