



TECHNIUM
SOCIAL SCIENCES JOURNAL

Vol. 37, 2022

**A new decade
for social changes**

www.techniumscience.com

ISSN 2668-7798



9 772668 779000

Degradation of outdoor spaces in condominiums of M'sila City (Algeria): causes and effects

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Abstract. The review of the scientific literature has shown that the external spaces of collective condominiums play an essential role in the inhabitant well-being and contribute positively to their moral health. However, in Algeria, these spaces suffer from many hazards, the negative effects of which are more and more palpable both on the urban and social levels. In the absence of development or lack of adaptation to the socio-cultural needs of their users, they appear to be abandoned, given the major misuse of uses promoting unhealthy conditions, insecurity and ill living. Like the Algerian cities, the external spaces of the condominiums of the city of M'sila are not immune to these urban diseases. By choosing three condominiums as a case study, this article attempts to assess the relationship that could exist between the quality of development and management (upkeep and maintenance) with the level of degradation of the exterior spaces of these condominiums, and this, through the survey technique. In a second step, and through the technique of semi-structured interview, the level of user satisfaction will also be assessed. Statistical data processing will be done using Sphinx plus² software (version5).

Keywords. Degradation, outdoor spaces, condominiums, development, management, M'sila

Introduction

Aware of the universal scope of the right to adequate housing, (UN, 1996; Donggen and Si-ming, 2006; Hoseini et al., 2013) the Algerian state has always seen housing as a major concern of its policy. Since 1970s, date of the appearance of the housing crisis, this sector has gradually become a worrying question, due to its triple dimensions: social, economic, and political ones. Since then, colossal funds have been poured out and considerable efforts have been made by the state to absorb the housing deficit (Safar Zitoun, 2012; Mili, 2018). Indeed, during the first three decades since the independence of the country, from 1968 to 1998, the state produced 1,553,686 dwellings only, compared to 3,837,209 built in recent decades, a triple production in favor of shelter seekers, the number continues to increase (MHU, 1993; Boutabba et al., 2019; Mouaziz-Bouchentouf, 2020). (Table 1).

Today, at the global level, the challenge of quantity is giving way to the challenge of quality. From now on, the challenge is to offer a quality living environment and take all the

necessary measures to preserve it. A living environment adapted to the new requirements of urban life, and to comply with the rules of sustainable development. In order to ensure such an achievement for the inhabitants of the cities of collective housing, policy makers and managers are invited to consider and deal with great care, as well, the built environment, represented by buildings, then the undeveloped environment symbolized by outdoor spaces (Arlot, 2005; Wallez, 2006; Bennedjai and Bencharif, 2017; Zhang, 2019, Yakubu, 2019; Gregory and Rogerson, 2019). In Algeria, given the increasing crisis in the area of collective housing noticed in the sector since the independence in 1962, the public authorities have top listed it seeing its urgency and therefore continue to take precedence of quantity over quality (Adad, 2004).

Table 1: The five-year housing programs (2005-2009 & 2010-2014 & 2015-2019)

Designation of housing segments	Five-year plan 2005- 2009	Rate %	Designation of housing segments with new name	Five-year plan 2010- 2014	Rate %	Five-year plan 2015- 2019	Rate %
Social rental housing (LSL)	311.890	25	Public rental housing (LPL)	700.000	27	800.000	43
Participatory social housing (LSP)	261.440	21	Public subsidized housing (LPA)	550.000	21	198.032	11
Housing intended for off-plan Sales (LVSP)	129.115	10	Rental and sale housing (LV)	/	/	400.000	22
Rural housing (LR)	510.696	41	Rural housing (LR)	900.000	35	400.000	22
Promotional accommodation (LP)	38.068	3	Promotional accommodation (LPP)	55.000	2	43.596	2
/	/	/	Housing (RHP) intended for the absorption of precarious housing	381.000	15	/	/
Total	1.251.209	100		2.586.000	100	1.841.628	100

Source: MHU, Auteur, 2020.

This restrictive vision had negative consequences on the living environment, which forms the daily life of the inhabitants. Thus, the spaces outside buildings of the entire collective park with all its segments are not immune to this situation of under-equipment, lack of development, and early deterioration (Kara and Bellal, 2017; Mezrag et al., 2018; Manaa and Alkama, 2018). Joint ownership (According to Art.743 of ordinance 75-58 of September 26, 1975 relating to the civil code, joint ownership is the legal situation of a constructed immovable or a group of constructed immovable whose ownership is divided between several people, in batches each including a private portion and a share in the common areas).

This very specific legal form of housing, defined as immovable property whose ownership is divided among several people, and though being well framed on the legal level in Algerian legislation, its management remains paradoxical. This is evidenced by the dismal condition of its common parts, including its spaces outside the buildings. In reality, co-ownership is a topical subject, since it is part of the current concerns of urban actors and has

been the subject of several university studies and media debates (Mebirouk et al., 2005; Kerdoud, 2005; Mili et al., 2015). This legacy, which is cumbersome to manage, is the subject of numerous reflections and positions adopted by decision-makers (politicians and developers), by researchers, and the skilled in the art (city specialists, architects, town planners), as well as by other disciplines such as sociology (Simon, 2013), economics (Richard, 2013), and law. In Algeria, outdoor spaces in collective housing, in general and co-ownerships in particular, are in the form of large free unstructured areas, allowing no sense of orientation and unsuited to the needs of their users (Bendib and Naceur, 2018).

This fact concerns all Algerian cities; including the city of M'sila that is the case study of this research, (the town hall of M'sila is located southeast of the capital of Algiers and north of the wilaya). The simple observation reveals abandoned residual spaces without function presenting permanent dangers. These spaces thus harm the environment by causing air pollution, visual and olfactory pollution, the health and safety of inhabitants through the proliferation of diseases, insecurity, and the urban landscape lacking suitable spaces for all categories of users (Dahdouh, 2001) such as:

- Absence of parking areas and invasion of free spaces by cars.
- Inappropriate spaces reserved for pedestrian and mechanical traffic.
- Insufficient play areas and meeting spaces.
- Lack of play areas and meeting spaces.
- Lack of green space.

These spaces are also experiencing a crisis of appropriation by a diversion of use highlighting dysfunctions of the designed spaces invested in uses other than the initial ones.

Methodology

The design of a harmonious and successful housing project that best satisfies the requirements of its users in terms of aesthetics and comfort and makes the housing city pleasant to live.

The urge is to provide quality for outdoor facilities and create an urban environment that allows everyone to feel at ease, recognize and appropriate their space (Ammiche et al., 2003; MHU, 2007; Boutabba et al., 2012). Guaranteeing the quality of housing production, and preserving the real estate heritage are for the Algerian State an issue of public interest and a political question.

This study aims to highlight the problems of use and operation of spaces outside buildings in condominiums. It allows in particular exploring the specificity of this type of space, the use of which is common and similar to other outdoor spaces in other types of habitats, but with a very different management mechanism (Muret et al., 1987). The usefulness of this research can be seen in its practical aspect specifically that of the management of these spaces, by trying to provide answers to the concerns of both stakeholders in the city and inhabitant users, which gives this, study a dual purpose. From one hand, it attempts to put under the microscope the relationship between the qualities of development and management (upkeep and maintenance) and the level of deterioration of spaces outside buildings. On the other hand, to measure the level of satisfaction of its users. For that, we have chosen to use the survey method and a set of research techniques. The means of investigation adopted is the technique of direct contact which is based on observation in situation as well as interrogation (interview

and questionnaire), with a semi-directive degree of freedom for the interview, and directive for the questionnaire. (Maurice, 2015). The quantitative and qualitative data collected through this investigative technique have been reported and processed by the Sphinx plus² software (Version5). To complete this research, the field survey was conducted in three stages.

First, we carried out a direct observation of the inventory according to a pre-established grid of observation defined "as a look at the situation" (Raymond and Fillieule, 2018; Maurice, 2015). The objective was to describe the layouts of the different types of outdoor spaces.

Then, a question form was distributed to the main occupants of the dwellings, considering the dwelling as a unit of measurement, which constitutes our sample (Gravel, 1980,). In addition, we used semi-structured interviews based on a pre-established interview guide (Berthier, 2008; Salès-Wuillemin, 2007) with the promoters concerned in order to identify the management methods that allow ensuring the upkeep and maintenance of spaces outside buildings. The survey took place over a period of 6 months, from October 15, 2018 to April 25, 2019. We interviewed the seven promoters concerned by the city 126 housing units, the People's Municipal Assembly of M'sila (town-hall elected members) concerned by the three cities and the Office for Promotion and Property Management of M'sila concerned by (the two cities 112 and 100 dwellings). We have chosen twelve representatives from each institution (APC: People's Municipal Assembly of M'sila "town hall" and the M'sila Promotion and Property Management Office "OPGI"); which raises our sample to 31. Through the techniques of the questionnaire and the research interview, we measured the level of satisfaction of the co-owners, vis-à-vis the quality of development, management, and the assessment of security, in terms of spaces outside buildings.

The final step is that of data processing by the computer tool. It used Sphinx plus² software (version 5). This tool allowed us to study and process the different variables, and this, through the different types of crosstab, flat and average. This use allowed us to identify, from one part, the relationships of dependence between the variables (quality, satisfaction, appreciation and use of spaces) and, from another, to model and express our interpretations.

To properly conduct our investigation, we have chosen three case studies.

These collective housing condominiums are part of the housing stock in operation in the town of M'sila. Knowing that the reliability of the information depends on the size of the sample (Rouag-Djenidi, 2003; Boutabba and Farhi, 2013) and in order to guarantee the representativeness of the study sample, we have chosen three co-ownerships belonging to different housing segments: Public Rental Housing (LPL), participatory social housing (LSP) and promotional housing (LP), for a total number of 338 housing units. We decided to extract a 30% sample. The sample size will therefore be $338 \times 30\%$ or 102 dwellings. The sample size for each city is calculated by applying the "rule of three". To ensure the representativeness of the sample, we used the type of probability sampling, namely simple random sampling. To select the elements of the population (the dwellings concerned), we used the computerized drawing process (Maurice, 2015). The questionnaire sent out after selection is 102. The return rate is 93%, i.e. 95 respondents (table 2).

Table 2 : Total number of observers by city

city	sample size	Number of citations	of citation rates after return
112 dwellings	34	31	32,6%
100 dwellings	30	28	29,5%
126 dwellings	38	36	37,9%
Total	102	95	100%

Source: Author, 2020.

Presentation of the study corpus

In order to ensure the representativeness of the corpus studied, our choice was directed towards three co-ownerships from different programs: The city 112 dwellings is taken from the public rental program sold, the city 100 dwellings comes from the participatory social program, as for the city 126 dwellings, it is part of the promotional program. These programs differ from each other in the budgetary achievement and beneficiary population.

Public Rental Housing is carried out on budgetary funds by project owners, which are the promotion and property management offices (OPGI). It is intended only for people whose income level is low. They are classified among the underprivileged social categories and without housing or living in precarious or insanitary conditions.

Participatory social housing is new form of housing, produced by a property developer, in accordance with technical specifications and defined financial conditions. It is intended for applicants eligible for state aid. This segment is therefore aimed at citizens with average incomes, whose level of resources per household allows them a substantial participation in the financing of the construction of their dwellings, which will be owned in a short term. The access to this type of housing is carried out according to a financial arrangement, which takes into account a personal contribution, a subsidized credit, and direct frontal aid from the national housing fund (CNL) which is paid to the promoter.

Real estate promotion includes all operations contributing to the realization of real estate projects intended for the sale, rental or the satisfaction of own needs as well as all the operations of mobilization of land and financial resources. This segment is aimed at high-income citizens, whose level of resources per household allows them to finance; without any help from the state, the construction of the houses they will own.

The cities that make up the study corpus also differ in terms of their locations. The two cities 112 and 126 housing are located in the city center in a place called "the Administrative City". On the other hand, the 100-unit housing estate is located on the outskirts of the city, at the POS 3 level in the place called "the Housing Estate 5 July 1962" (Fig.1).

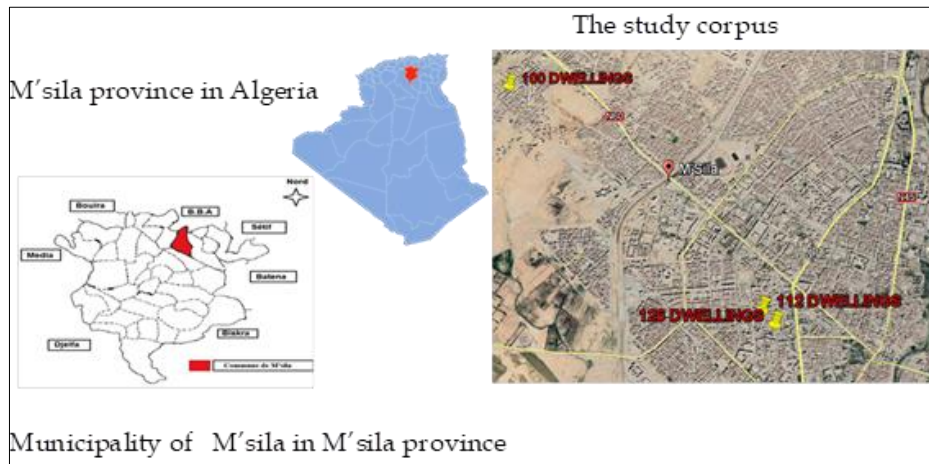


Fig.1: situation of the cities studied in the city of M'sila

Source: Wikipedia; Google Earth; author 2020.

The city 112 dwellings (LPL)

Unanimously called by "buildings of the Italians", considering its construction by an Italian company, the city 112 housing LPL has been constructed in 1986 by the Office of Promotion and Real Estate Management of M'sila "OPGI" and exploited the same year. This condominium includes 70 dwellings sold and 42 dwellings rented (OPGI Statistics, 2018). The city consists of fourteen prefabricated blocks. The buildings are of the same height. Types of housing: 56 F3 type housing, 50% of the program and 56 F4 type housing, 50% of the program (Fig.2).

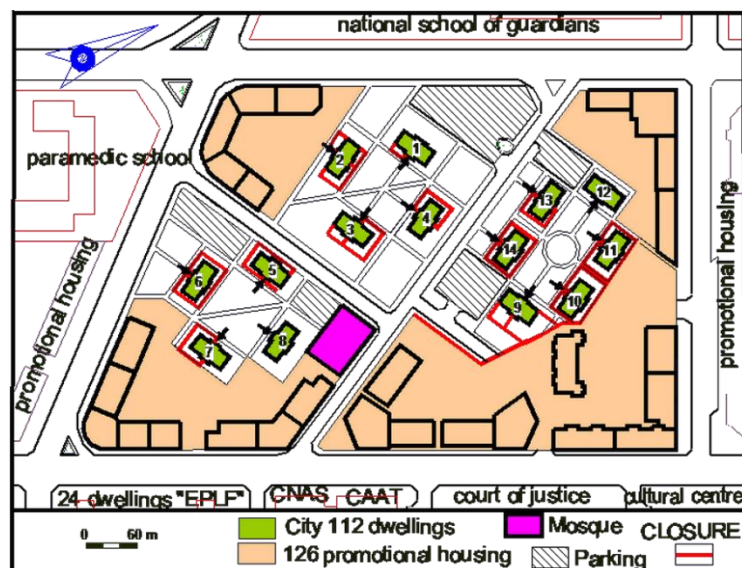


Fig.2: Mass plan of the city 112 dwellings

Source: author, 2020.

The city 100 dwellings (LSP)

Carried out in 2009 by the public promoter "OPGI". Nine companies were commissioned to carry out the program. The city is made up of sixteen (16) blocks (Fig.3), with sixty-four (64) commercial premises on the ground floor. The blocks are produced on four levels (fourteen C + 3 blocks and two R + 3 blocks).

The buildings include two types of housing:

- 84 F3 type dwellings, or 84% of the program;
- 16 F4 type dwellings, or 16% of the program.

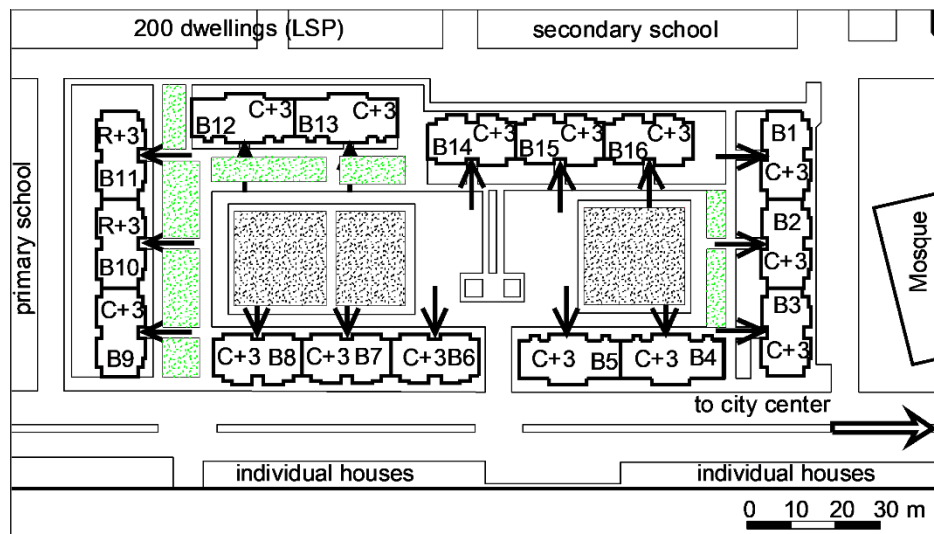


Fig.3: Mass plan of the city 100 dwellings

Source: Author, 2020.

The city 126 dwellings (LP)

Undertook in 1989 by seven (7) private developers. This city is characterized by a morphological and architectural heterogeneity. The condominium consists of twenty-seven (27) blocks (Fig.4). Three (03) of which are built on two (02) levels, with shops on the ground floor (C + 1), fourteen blocks (14) are built on three (03) levels (C + 2), seven blocks (07) are built on four (04) levels (C + 3), while the last three (03) blocks are built on five (05) levels (C + 4). The buildings house 53 commercial premises and four types of housing:

- 21 F3 type dwellings or 16.67% of the program;
- 35 F4 type dwellings or 27.78% of the program;
- 46 F5 type dwellings or 36.51% of the program;
- 24 F6 type accommodation, or 19.04% of the program.

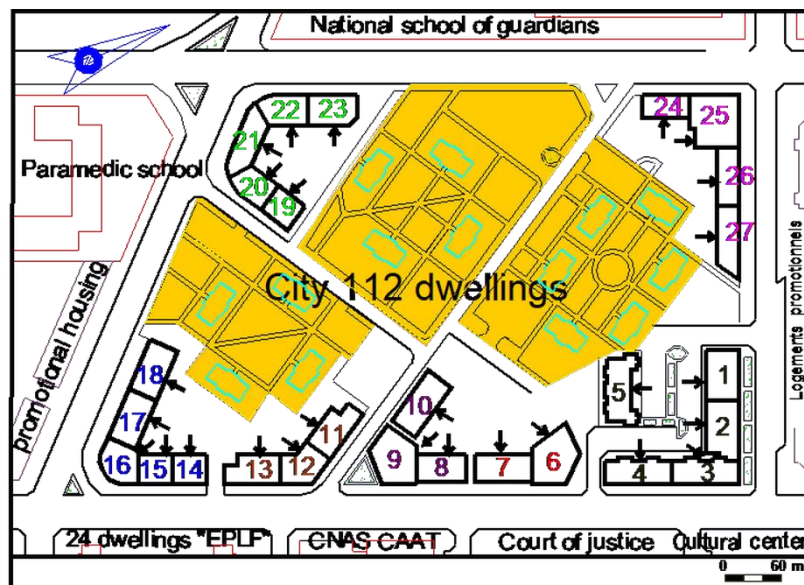


Fig.4: Mass plan of the city 126 dwellings
Source: Author, 2020.

Results

Status of the outside spaces in the cities studied

In collective housing districts, buildings and their surroundings, which are often undeveloped spaces, constitute two inseparable components. The combination of these two elements forms the space of urban life. The surroundings, consisting of green spaces, playgrounds, roads, parking lots are also called outdoor spaces. These are developed areas, which have not been built according to the needs of users (De Sablet, 1988; Verdine, 1979; Laborde, 2005). These spaces are areas open to all categories of users and must support complementary functions to those of private life in the space of the accommodation. In other words, “*extend the sphere of the inhabitants beyond the strict apartment so that they feel more at home around their homes*” (Panerai, 2007). These spaces are necessary for the development of a collective and public life in the city. They are therefore supposed to be arranged in such a way as to guarantee their proper use and contribute to the development of social relations (Mebirouk et al., 2005).

According to a pre-established grid, direct observation in situation of the inventory, allowed us to describe the arrangements of the different types of spaces and equipment available to the studied cities. (Table 3).

Table 3: Inventory of urban equipment in the study corpus

Provision of urban equipment	112 dwellings (LPL)	100 dwellings (LSP)	126 dwellings (LP)
Closure	NO	NO	NO
Portal	NO	NO	NO
Guard lodge	NO	NO	NO

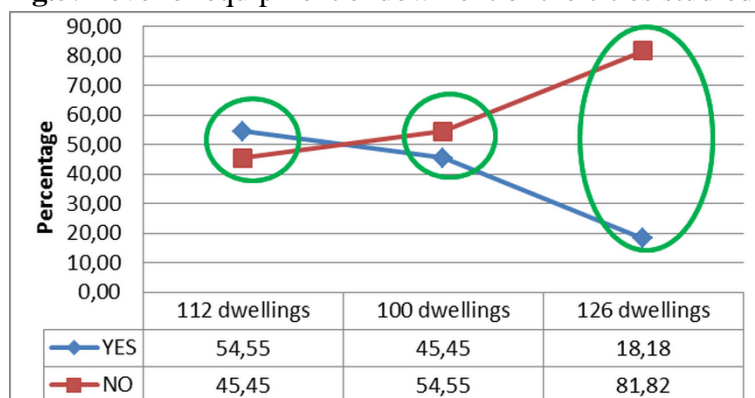
Developed children's playground	NO	NO	NO
Landscaped area	NO	NO	NO
Road covering	YES	YES	NO
Parking lot coating	YES	YES	NO
Pavement covering	YES	YES	NO
Water cover	YES	NO	NO
Public lighting	YES	YES	YES
Garbage containers	YES	YES	YES

Source : author, 2020.

The use of the information collected has enabled us to observe the following (Fig.5):

- The two cities, 112 and 100 dwellings, display the same level, in terms of endowment of types of space and equipment.
- The city of 112 dwellings has six (6) criteria out of eleven (11), or 54.55% of available criteria, against unavailable 45.45%.
- The city of 100 dwellings has five (5) criteria out of eleven (11), or 45.45% of available criteria, against unavailable 54.55%.
- The city of 126 dwellings has a very low level of endowment. It has two (2) criteria rated on eleven (11), i.e. 18.18% of available criteria, against unavailable 81.82%.

Fig.5: Level of equipment endowment of the cities studied



Source: author, 2020.

Description of the quality of the amenities of the cities studied

The roads, sidewalks, and public lighting outside the cities in question are in good condition. However, the interior layout is degraded. The state of the spaces is not identical. It is different from one city to another; in terms of numbers, types of spaces, and materials used in.

The city 112 dwellings

The roads and parking lots are made of bitumen. The sidewalks and pedestrian crossings are made of tiles and concrete. The city does not have green space and equipped playgrounds. The location and shape, green spaces and play areas, are materialized on site, however, they do not have any particular arrangement.

(Fig.6).



Fig.6: Inventory of the different types of spaces in the city 112 dwellings

Source: Author, 2020.

The city 100 dwellings

The ground is paved with concrete paver that of the pedestrian crossings are tiled. The city does not afford parking lots spaces. Vehicle parking is provided by the roadway area. The location and shape of green spaces and play areas are materialized on site; however, they do not have any special arrangement (Fig.7).



Fig.7: Inventory of the different types of spaces in the city 100 dwellings

Source: Author, 2020.

The city 126 dwellings

The city is deprived of all types of space. It therefore lacks roads, parking lots, sidewalks, green spaces and even playgrounds. These spaces are not built, thus not respecting either the development plan or the building permit conditions. The land let for outdoor spaces is left, to this day, in its raw state without any intervention. (Fig.8).



Fig.8: Inventory of the different types of spaces in the city 126 dwellings

Source: Author, 2020.

The urban indicators of the cities studied

To conduct this study, we have chosen, among the basic parameters, those that are commonly sought in analytical studies (Boutabba, 2001; Hattab and Ziane, 2003; Nouibat, 2007; Feloussia 2014; Lakhdar Hamina and Abbas, 2015; Laouar et al., 2019; Guerroudj, 2010; MHU, 2011; Zucchelli, 1983).

These indicators affect eight (8) evaluation criteria (Table 4)

Table 4: Criteria for evaluating urban indicators

N°	Criterion	Definition	Observation
1	The city overall Surface	Gross land area	SG : Expressed in (m ²)
2	The city built surface	the footprint of the buildings	SB : Expressed in (m ²)
3	The outdoor spaces surface	Undeveloped floor area affected	SNB : Expressed in (m ²) It brings together all the spaces used, fitted out and which have one or more functions (roads, play areas, green spaces, parking lots and sidewalks).
4	The Unused surface	Undeveloped floor space not affected	SNU : Expressed in (m ²) It includes all unused, undeveloped spaces; and which have no function.
5	The footprint coefficient	Ratio of the footprint of the construction to the land area	CES = SB/SG
6	The land occupancy coefficient	Ratio between the maximum net buildable surface area on a plot of land and the area there	COS = SHON/SG SHON (Net surface area) : SHOB less in particular, non-convertible surfaces (cellar, some technical rooms), vehicle parking surfaces, terraces, balconies, loggias and open space on the ground floor. SHOB (Gross floor area): Sum of floor areas of each level of construction.
7	The Residential density	Ratio between the number of dwellings and the surface area of the area considered	DR=NUMBER OF ACCOMMODATIONS/SG SG : Expressed in hectares
8	Index of use	the land use indicator	IU=SU/STB It expresses the relationship between the area used (SU) "which is none other than the built area of the city added to the area of outdoor spaces" and the overall area of the city called Total Gross Area (STB).

Source: author, 2020.

The city of 112 dwellings

The city occupies an overall surface estimated at 12,082m². 53 % of the surface (6,414 m²) is intended for external surface (roads, parking lots, and sidewalks, green space). While the built surface is significantly lower, it represents only 25% of the total surface, or 3,024 m². The unused surface is almost equal to the built surface; it is estimated to 2,644 m² or 22% of the overall surface of the city. (Fig.9).

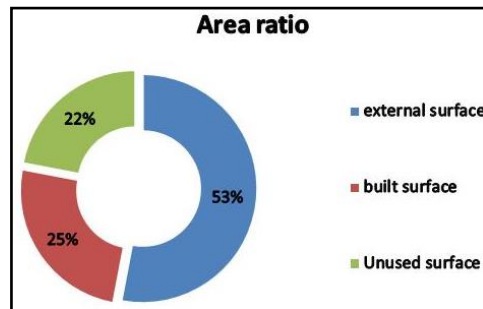


Fig.9: Area ratio of the city 112 dwellings

Source: author, 2020.

These data make it possible to determine the density indicators described above. They reflect the state of distribution of the city different spaces.

COS = 1.00: This is an acceptable coefficient compared to that adopted in the master development and urban plan "PDAU" (Revision of PDAU of M'sila in 2015. The COS varies between 1 and 1.5. The CES varies between 0.60 and 0.8. The average density varies between 50 and 70 dwellings per hectare); since it gives a (net surface area: SHON = 1 X 12,082 = 12,082 m²). This buildability ratio gave a built surface which represents 50% of the surface of the outdoor spaces, making buildings with four levels (R + 3) only.

CES = 0.25: This is a very low coefficient, compared to that adopted in M'sila's Master Plan for Planning and Town Planning (PDAU). This build ability ratio gave a large surface area of outdoor spaces, which represents 53% of the overall surface of the city.

IU = 0.78: this index indicates that 78% of the overall surface of the city (9.438 m²) is used; on the other hand, the unused area represents only 22% (it is an undeveloped area). It is close to the footprint of buildings.

Density = 92.69 dwellings /he: the residential density of the city is very high; it greatly exceeds the average national threshold, adopted by the PDAU of M'sila.

The city of 100 dwellings

The city occupies an overall surface estimated at 12,925 m². 64% of this surface, or 8,324 m², is intended for external surface (roads, parking lots, and sidewalks). 28% or 3,578 m² represents the built surface.

It is much smaller than the surface of external surface. The unused surface is small. It is estimated at only 1,023 m², or 8% of the overall surface of the city. (Fig.10).

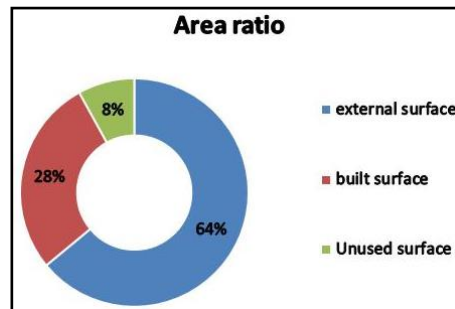


Fig.10: Area ratio of the city 100 dwellings
Source: author, 2020.

These data make it possible to determine the density indicators described above. They reflect the state of distribution of the different spaces of the city.

COS = 1.00: This is an acceptable coefficient, compared to that adopted in the PDAU of M'sila; since it gives a (net surface area: SHON = 1.00 X 12.925 = 12.925m²). This build ability ratio gave a built surface area significantly lower than the surface area of the outdoor spaces, by making buildings with four levels (R + 3, and C + 3).

CES = 0.27: This is a low coefficient, compared to that adopted in the PDAU of M'sila. This build ability ratio gave a

large surface area of outdoor spaces, which represents 64% of the overall Surface of the city

UI = 0.92: this index indicates that 92% of the overall surface of the city (12,925 m²) has been used. On the other hand, the unused surface represents only 8% (it is an undeveloped surface).

Density = 77.37 dwellings /he: the residential density of the city is acceptable. It is close to the national average, adopted by the PDAU de M'sila.

The city of 126 dwelling

The city occupies an overall surface estimated at 23,877 m². 48% of this surface or 11,416 m² is intended for external surface (roads, parking lots, and sidewalks). 39% or 9,224 m² represents the built surface.

It approaches the surface of external surface. The unused surface is small, estimated at 3,237 m², or 13% of the overall surface of the city. (Fig.11).

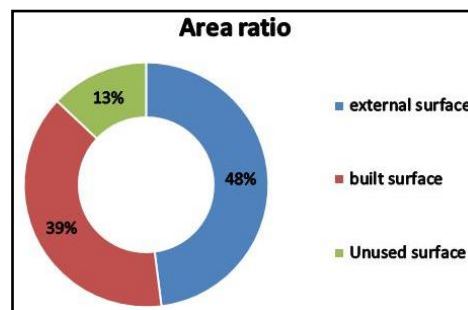


Fig.11: Area ratio of the city 126 dwellings
Source: author, 2020.

These data allow determining the density indicators described above. They reflect the state of distribution of the city different spaces.

COS = 1.16: This is an acceptable coefficient, compared to that adopted in the PDAU of M'sila, since it gives a (net surface area excluding work: $SHON = 1.16 \times 23.877 = 27.697.32m^2$). This build ability ratio gave an acceptable surface of outdoor spaces, by constructing buildings spaces, which represents 48% of the overall surface of the city.

UI = 0.86: this index indicates that 86% of the overall surface of the city (9,438 m²) is used, whereas the unused surface represents only 14% (it is an undeveloped area).

Density = 52.85 dwellings /he: the residential density of the city is acceptable; it is in line with the national average adopted by the PDAU of M'sila.

With different levels (C + 1, C + 2, C + 3, and C + 4).

CES = 0.38: This is a low coefficient, compared to that adopted in the PDAU of M'sila. This build ability ratio gave an acceptable surface area of outdoor.

Synoptic urban indicators

Data calculated based on the ground plans of the three cities are reported in (Table 5 below).

Table 5: the urban indicators of the three cities

City	Land surface	Built surface	external surface	unused surface	CES	COS	Density	IU
112 dwellings	12082	3024	6414	2644	0.25	1.00	92.69	0.78
100 dwellings	12925	3578	8324	1023	0.27	1.00	77.36	0.92
126 dwellings	23877	9224	11416	3237	0.38	1.16	52.85	0.86

Source : author, 2020.

1. The coefficient of footprint (CES): the coefficients of the three cities are low compared to the coefficient adopted by the PDAU of M'sila (CES varies between 0.60 and 0.8). This explains the high percentage of outdoor spaces, compared to land surfaces. (Fig.12).

2. The coefficient of land use (COS): the coefficients of the three cities are identical and acceptable compared to the coefficient adopted by the PDAU of M'sila (COS varies between 1 and 1.5). These buildability ratios have resulted in significantly lower built-up surfaces than the surfaces of outdoor spaces. (Fig.12).

3. Density: the densities of the three cities differ. The city of 126 housing units has an acceptable residential density. It is in line with the national average. The city of 100 dwellings has an acceptable residential density. It is close to the national average. The 112-unit housing estate has a very high residential density. It greatly exceeds the national average threshold adopted by the PDAU of M'sila. The average density varies between 50 and 70 dwellings per hectare.

4. Land Use Index (UI): The land use indexes of the three cities are high. They indicate a high use of land areas. This explains the low percentage of unused areas. (Fig.12).

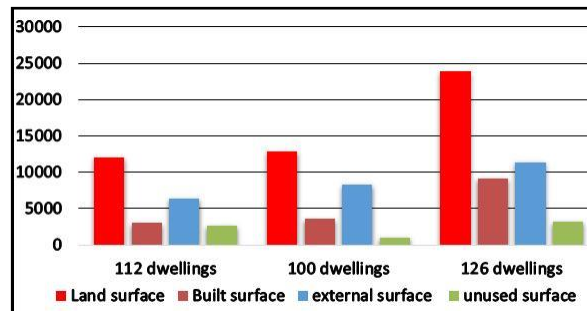


Fig.12: Surface ratio of the three cities
Source: author, 2020.

Spaces outside buildings and the joint ownership system

Several studies attach importance to the place of outdoor spaces in real estate, in collective housing estates by focusing on the main criteria around which the modes of living or the issues that interact between the social relations and spatial occupation (Graff, 2001; Allen et al., 2004; Bennedjai and Bencharif, 2017). The importance of the design and layout of outdoor spaces in the quality of life of collective housing estates is asserting itself and therefore arouses many critics (Hatzfeld and Moutton, 2006). Outdoor spaces must provide functions linked to collective life and good neighborliness (meeting with neighbors, safe children's games, parking vehicles, guaranteeing an aesthetic vision of the neighborhood). (CAUE, 2015). It is for this reason that the spaces around residential buildings determine, as well as private internal spaces, the quality of life of residents in collective housing. Thus, the question which challenges urban actors, city managers, and users of collective space is how to take into account the problem of management (service and maintenance) of outdoor, shared spaces, both in terms of diversity of programs, only in terms of uses or functions.

We start from the principle that public space is the undeveloped part of the base of collective housing estates, as assigned to public uses. In addition, that the spaces outside buildings, which constitute a reduced part of this type of space, must include a set of spatial components designed in accordance with the standards established by regulatory technical documents (DTR), so that "generations" can coexist there and use it easily. The spaces outside the buildings are land, urban, architectural and social spaces. They are the places of exercise of citizenship from which no one should be excluded (URBACT, 2007). They are perceived, experienced, and very versatile, by their pluralism, both from the point of view of the diversity of the places they occupy, the forms they take, and the uses they choose. They are marked by various temporalities, different uses depending on the moments, the days (Batsie and Dezert, 1991). The spaces outside the buildings, in collective housing units in co-ownership, belong to all the co-owners. They are part of the common parts (are the parts of buildings and land, which belong indivisibly to all the co-owners, each for a share related to each lot, and which are assigned to the use or utility of all or more of the co-owners) (Ordinance No. 75-58, 1975; Executive Decree No. 14-99, 2014). The fact that these spaces do not have a special status constitutes an ambiguity in their uses and management.

Ten questions have been formulated and submitted to the various stakeholders (Promoters, OPGI and APC) in order to assess the application of the co-ownership regime in the studied cities.

The essence of the obtained responses can be summarized as follows:

For the three partners, the spaces outside the buildings are common spaces integrated into the condominiums. In other words, they belong in joint possession to all co-owners. The documents issued to the owners contain no indication in terms of the importance of the installation of the management bodies within the framework of the texts governing co-ownership, in particular the Civil Code of 1975.

No indication is given as to the designation of the common parts, or their descriptions. In addition, no procedure or condition is mentioned there to clarify the terms of enjoyment of the common parts and the obligations of the co-owners towards its spaces.

Management of spaces outside buildings: A major challenge

The study of the management of spaces outside buildings leads us to study them, according to (Bretesché, 2013) under several dimensions such as modes, organizations, and contributors in this type of space. This problem, of managing urban space in general and of public space in particular is considered to be a major issue that is extremely diverse and important (Mili et al., 2019). The intervention of the different owners of

public and private works as well as that of the local authorities, sometimes managing thousands of dwellings, have led to a faulty management method. To this latter, is added the social practices of the inhabitants, by appropriating the space in a singular way, which has given rise to specific collective housing cities with specific and visible peculiarities, notably at the level of management of their outdoor spaces. This management seems to be difficult, due to the multiplicity of managers with different objectives, skills, and means. It is complex, owing to the organization of the relationship between a public space outside and the private space inside the accommodation.

The deficit in the management of outdoor spaces leads to their rapid deterioration and reduces their sustainability. *“This management deficit generates considerable investment costs, because it leads to very costly urban renewal operations to halt these degradation processes”* (Bonetti and Bouvier, 2007).

Twelve questions were formulated and asked to the various actors in order to assess all the tasks and management skills, to create and preserve a better living environment. The summaries of the responses obtained can be read as follows:

The OPGI deals only with the non-sold buildings of City 112. However, these managers do not intervene in the city of 100 dwellings. The APC (town hall) intervenes only outside the city limits because they are considered public spaces of the city. The promoters claim that they are not concerned with administration and management. The three actors claim that there is no coordination. Each year, OPGI launches an operation to popularize the texts governing condominiums.

This operation is intended for the inhabitants of the cities carried out by this organization. All the co-owners of the cities concerned appoint no co-ownership management body.

Operation of outdoor spaces

Understanding the functioning of outdoor spaces in the cities studied is a necessary and essential step for its management. It is necessary since it consists in researching and characterizing the functions offered by the outdoor spaces considered as a product, in order to understand the way in which these spaces are used. This will improve their management and maintenance. It is important because it allows us to test the nature and importance of the various factors that can contribute to the satisfaction of its co-owners.

Based on the technical prescriptions (MHU, 2007) and the guidelines setting the surface and comfort standards (Decrees of 17/10/2004, 31/12/2012 and 30/01/2018), and by dividing the buildings into residential units (PUCA, 2011), our direct observation, in situation, has enabled us to note that most of the spaces outside the buildings are in the form of vacant spaces, partially furnished, and reflecting no form of operation in terms of use:

- These spaces are not valued, for lack of relationship materialized by hierarchical spaces. This is the case for the 126 and 100 dwellings cities.
- Lack of quality outdoor facilities and urban furniture suitable for green spaces and playgrounds in the three cities.
- Lack of quality outdoor facilities and urban furniture suitable for green spaces and playgrounds in the three cities.
- Access roads and mechanical roads lack adequate coatings (the use of hot mix asphalt). This is the case of the 100-unit and the 126-unit cities, which are not developed.
- Spaces reserved for pedestrian traffic overlap with spaces reserved for mechanical circulation (roads and parking lots). This is the case of the 100 dwellings city.
- The outdoor spaces, of the three cities, re-arranged without caring about people with reduced mobility.
- Absence of play and relaxation areas for the three ages: play area for children, convivial spaces for young people, and meeting relaxation areas for adults.
- Insufficient parking spaces at the three cities.
- The exterior lighting does not guarantee sufficient brightness, at the level of the three cities.

Discussion

To apprehend a phenomenon, we have used the questionnaire survey, which collects information based on the analysis of responses on questions in relation to the studied theme (Boutabba and Farhi, 2012).

The questions in the questionnaire related to this study covered mainly the legal status of spaces outside buildings in condominiums, their qualities of development, the aspects of their degradations, their upkeep and maintenance. In addition, these questions help to test the degree of satisfaction of residents with the development and management of outdoor spaces, and to measure the feeling of security. The quantitative and qualitative data collected through this investigation technique were reported and processed by the Sphinx plus² software (version 5). Through a correlative analysis between the different variables, we

were able to bring out some models and make certain interpretations (Mili et al., 2015).

Legal status of spaces outside buildings

Knowledge of the legal status of outdoor spaces varies from one city to another. This is clear from the obtained answers (95 citations) when we asked the co-owners about the issue. The results obtained are reported in (Table 6). The descriptive analysis from the questionnaire has shown that 47.4% of the co-owners believe that the outdoor spaces are the property of the condominium against 34.7% who see them as a state property; whereas 17.9% claim that, they belong to the promoter.

Table 6: Legal status of building exterior spaces

Statut City	Ownership of the state	Ownership of the condominium	Ownership of the promoter	Total
100 LSP	28,6 % (8)	57,1 % (16)	14,3 % (4)	100 % (28)
112 LPL	16,1 % (5)	61,3 % (19)	22,6 % (7)	100 % (31)
126 LP	55,6 % (20)	27,8 % (10)	16,7 % (6)	100 % (36)
Total	34,7 % (33)	47,4 % (45)	17,9 % (17)	100 % (95)

Source: author, 2020.

The chi2 test gives a significant dependence. $\chi^2 = 13.25$, $ddl = 4$, $1-p = 98.99\%$.

For the 126 dwellings city, we see that the actual workforce estimated at 55.6% is significantly higher than the theoretical workforce (34.7%) is. This workforce believes that outdoor spaces are the property of the state. The actual headcount (16.1% for the city of 112 housing units and 27.8% for the city of 126 housing units) is significantly lower than the corresponding theoretical headcount: 34.7% for the inhabitants of the city of 112 housing units, who estimate that the exterior spaces are the property of the state. 47.4% for the inhabitants of the city 126 housing, who believe that the outdoor spaces are the property of the condominium. Concerning the co-owners of the three cities who believe that the outdoor spaces are the property of the co-ownership (45 quotes), the following has been recorded:

- 57.1% or (16 citations), corresponds to the 100 dwellings city;
- 61.3% or (19 citations), corresponds to the 112 dwellings city;
- 27.8% or (10 citations), corresponds to the 126 dwellings city.

The results of the 100 and 112 housing units are the result of the popularization of the texts governing the condominiums launched by OPGI. The result of the 126 housing city indicates the lack of information on the regulations in force related to the condominium.

The administration and management of outdoor spaces: shared responsibility

When we asked the co-owners about the person in charge of the management, we have obtained answers (95 quotes) who believe that this responsibility is shared. The results obtained are reported in table (Table 7).

The descriptive analysis from the questionnaire has shown that 53.7% of the co-owners believe that the inhabitants are responsible for the management of their city, compared to 33.7%

who consider that the management of this city is the responsibility of the municipality and only 12.6% think the promoter is responsible.

Table 7: Responsibility for care and maintenance of exterior spaces

Responsibility City	The inhabitants	The municipality	The promoter	Total
100 LSP	50,0 % (14)	28,6 % (8)	21,4 % (6)	100 % (28)
112 LPL	64,5 % (20)	16,1 % (5)	19,4 % (6)	100 % (31)
126 LP	47,2 % (17)	52,8% (19)	00,0% (0)	100 % (36)
Total	53,7 % (51)	33,7 % (32)	12,6% (12)	100 % (95)

Source: author, 2020.

The chi2 test gives a very significant dependence. $\chi^2 = 15.35$, $ddl = 4$, $1-p = 99.60\%$. For the city 126, we see that the actual workforce (52.8%) is significantly higher than the theoretical workforce (33.7%) is. This workforce believes that the municipality is responsible for the administration and management of outdoor spaces. The actual headcount (16.1% for the city of 112 housing units and 00.0% for the city of 126 housing units) is significantly lower than the corresponding theoretical headcount: 33.7% and 12.6%.

Of the co-owners (51 quotes), of the three cities, who consider that the administration and management of outdoor spaces is the responsibility of the inhabitants, the following has been recorded:

- 50.0% or (14 citations), corresponds to the city of 100 dwellings;
- 64.5% or (20 citations), corresponds to the city of 112 dwellings;
- 47.2% or (17 citations), corresponds to the city of 126 dwellings.

The results of the 100 and 112 housing units cities are the result of the popularization of the texts governing the condominiums launched by OPGI.

The result of the 126 dwellings city indicates that the Co-owners categorically reject the responsibility of the developer. They believe that this task should be carried out by the municipality. We note that the responses obtained confirm that the administration and management of outdoor spaces within the condominiums is a shared responsibility. We note that the co-owners (53.7%) believe that the administration and management of outdoor spaces are the responsibility of the inhabitants first, then (33.7%) who believe it is the responsibility of the municipality.

Physical state of spaces outside buildings: a degraded

The responses obtained (95 citations) to the question concerning the current situation of the physical state of outside buildings spaces within the condominiums consider that this situation is rather degraded.

The results obtained are reported in (Table 8 below).

Table 8: Condition of exterior spaces

Space condition City	Acceptable	Little degradation	Degraded	very degraded	Total
100 LSP	46,4 % (13)	53,6 % (15)	00,0 % (0)	00,0 % (0)	100 % (28)
112 LPL	9,7% (3)	51,6 % (16)	38,7 % (12)	00,0 % (0)	100 % (31)
126 LP	00,0 % (0)	00,0% (0)	38,9% (14)	61,1% (22)	100 % (36)
Total	16,8% (16)	32,6 % (31)	27,4% (26)	23,2% (22)	100 % (95)

Source: author, 2020.

The chi2 test gives a very significant dependence. $\chi^2 = 87.41$, $ddl = 6$, $1-p \Rightarrow 99.99\%$.

For the 100 and 112 housing estates, the descriptive analysis from the questionnaire has shown that 16.8% of the co-owners believe that the spaces outside the buildings are acceptable and 32.6% of the co-owners see that they are not deteriorated. For these two estates, the condition of the outdoor spaces is almost similar.

For the cities 112 and 126 dwellings, 27.4% of the co-owners affirm that these spaces are degraded and 23.2% view them as being very degraded spaces.

Concerning the 100 dwellings case: the inhabitants consider that these spaces are either acceptable (46.4%), or little degraded (53.6%), given that the city has exterior spaces characterized by deficiencies in planning. We note that the actual workforce (46.4%) is significantly higher than the theoretical workforce (16.8%) is and that the actual workforce (53.6%) is significantly higher than the theoretical one (32.6 %) is.

Regarding the of 112 dwellings estate, dwellers diverge in opinion concerning spaces: acceptable (9.7%), little degraded (51.6%), and degraded (38.7%) since the city has degraded outdoor spaces. We note that the actual workforce (9.7%) is significantly lower than the theoretical workforce (16.8%) is, and that the actual

workforce (51.6%) is significantly higher than the theoretical one (32.6 %) is.

The actual workforce (38.7%) is significantly higher than the theoretical workforce (27.4%) is. We notice that the physical state of the spaces outside the buildings of the city is rather degraded. Indeed, we find 51.60% of the population who believes that the situation of outdoor spaces is degraded and 38.70% of the population believes that it is little degraded, against only 9.60% who considers that the state is acceptable.

Regarding the of 126 dwellings estate: residents believe that these spaces are either degraded (38.9%), or very degraded (61.1%), since the city lacks exterior spaces. We note that the actual workforce (38.9%) is significantly lower than the theoretical workforce (27.4%) is, and the actual workforce (61.1%) is significantly higher than the theoretical workforce (23.2 %) is.

Causes of deterioration of spaces outside buildings

The responses obtained (196 citations), to the question concerning the causes of the current

physical condition, of the spaces outside the buildings, within the condominiums are reported in (Table 9).

Table 9: Causes of degradation of exterior spaces

Causes City	acts of Vandalism	Neglect and letting go of the inhabitants	Insufficient care and maintenance	quality of execution	Total
100 LSP	00,0 % (0)	31,0 % (18)	41,4 % (24)	27,6 % (16)	100 % (58)
112 LPL	27,3 % (18)	27,3 % (18)	31,8 % (21)	13,6% (9)	100 % (66)
126 LP	00,0 % (0)	30,6 % (22)	29,2% (21)	40,3 % (29)	100 % (72)
Total	9,2 % (18)	29,6 % (58)	33,7 % (66)	27,6 % (54)	100 % (196)

Source: author, 2020.

The chi2 test gives a very significant dependence. $\chi^2 = 46.03$ with a $ddl = 6$ and a $1-p \Rightarrow 99.99\%$.

The descriptive analysis from the questionnaire has shown that the responses of the three cities are almost identical. 33.7% of co-owners believe that poor maintenance and repair are the main cause of spaces deterioration outside buildings. The neglect and letting go of the inhabitants represent the second factor with 29.6%. As for the quality of execution, it ranks third. Only 9.2% of the population believes that vandalism is one of the causes of the degradation of outdoor spaces. With regard to the city of 100 dwellings: 41.4% of co-owners believe that failures in upkeep and maintenance are the main cause of deterioration of spaces outside buildings. The neglect of the inhabitants represent the second cause with 31.0%. As for the quality of execution, it is backlisted with 27.6%.

Regarding the of 112 dwellings area: 31.8% of co-owners believe that failures in upkeep and maintenance are the main cause of deterioration of spaces outside buildings. Negligence and neglect by residents and acts of vandalism come as a second cause with 27.3%. Analysis

has shown that all of the occupants of the ground floor accommodation have squatted and fenced the outdoor spaces adjoining their accommodation. Only 13.6% of the population are convinced that the quality of execution is among the causes of degradation of outdoor spaces.

Regarding the of 126 dwellings estate, 40.3% of co-owners believe that the quality of execution is the main cause of deterioration of spaces outside buildings. The neglect of the inhabitants represents the second cause with 30.6%. As for the failure of servicing and maintenance, it ranks third with 29.2%.

The condition of the spaces outside the buildings influences the satisfaction of residents

To test the satisfaction of the co-owners with the physical condition of the outdoor spaces, we have adopted the following criteria: Very satisfied, Satisfied, Little satisfied, and Dissatisfied. According to the obtained results (Table 10), the appreciation of the inhabitants (95 citations) varies between “little satisfied” and “dissatisfied”.

Tableau 10: Relation satisfaction of the inhabitants and physical condition of exterior spaces

Space condition Satisfaction	Acceptable	Little degradation	Degraded	very degraded	Total
satisfied	8,4 % (8)	8,4 % (8)	00,0 % (0)	00,0 % (0)	16,8 % (16)
little satisfied	8,4 % (8)	11,6 % (11)	12,6 % (12)	00,0 % (0)	32,6 % (31)
dissatisfied	00,0 % (0)	12,6 % (12)	14,7 % (14)	23,2 % (22)	50,5 % (48)
Total	16,8 % (16)	32,6 % (31)	27,4 % (26)	23,2 % (22)	100 % (95)

Source : author, 2020.

The descriptive analysis from the questionnaire has shown that the inhabitants are rather dissatisfied. Indeed, the analysis resulted in that 83.2% inhabitants are not very satisfied and dissatisfied against only 16.8 who are satisfied with the physical condition of the outdoor spaces.

- The satisfied population, representing a rate of 8.4%, believes that the physical condition of the outdoor space is acceptable. It has the same opinion concerning little degradation.
- The unsatisfied population believes that the physical condition of the outdoor spaces is acceptable (8.4%), poorly degraded (11.6%), and degraded (12.6%).
- The dissatisfied population believes that the physical condition of the outdoor spaces is not badly degraded (12.6%), degraded (14.7%) and much degraded (23.2%).

The classification obtained by the mobile center method (Fig.13) shows that the degree of satisfaction of the inhabitants is depending on the physical state of the outdoor spaces. Two variables were used:

State of spaces and satisfaction of physical state.

The initial partition is created on the distribution of the variable "City". The classification has given three classes:

Class n ° 1: groups the population of the two cities 100 and 112 dwellings which assigns a physical score of (3.33) below the average assessed at (4.57/6) to the physical state of the outdoor spaces (The state very degraded is noted on a scale of 6). It's a population satisfied

with the physical state of spaces. It affects satisfaction=2.67 above the average (1.66/4). (Satisfaction is noted on a scale = 4).

Class n ° 2: Joins the population of the two cities 100 and 112 dwellings. It assigns a rating of (4.34) below the average (4.57/6) to the physical state of the outdoor spaces. It's a population that is not very satisfied with the physical state of spaces. It affects satisfaction = 1.66 equal to the average (1.66/4).

Class n ° 3: Gathers the population of the city 126 dwellings, which assigns to the physical state of outdoor spaces, a score (5.61) above the average (4.57/6).

It is a population dissatisfied with the physical state of the spaces. It affects satisfaction = 1, significantly lower than the average (1.66/4).

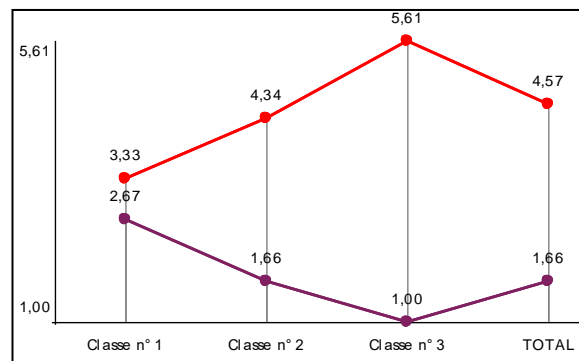


Fig.13: Automatic classification

Space condition — and Satisfaction physical condition

Source: author, 2020

Conclusion

Via the studied corpus, the problem of spaces outside buildings in M'sila condominiums recalls that of outdoor spaces in all condominiums in Algeria. Our analysis has been devoted to outdoor spaces in three co-owned estates in the City of M'sila, has allowed us to note the quantitative and qualitative degradation of these spaces. This deterioration is perceived following the lack of necessary outdoor spaces, in particular, by the adequate development (Playground for all age groups, urban furniture, green space, and parking areas) and following the quality of management of these spaces. This research was based on the survey approach, to elucidate, on the one hand, the relationship between the quality of development, management, and the level of deterioration of spaces outside buildings. On the other hand, to measure the impact of this degradation on the level of satisfaction of the users of those spaces. Three investigative tools were used, namely direct observation, interview and questionnaire. The latter was processed by Sphinx plus² version 5 software, which led to various interpretations. The analysis of the obtained results, both during the interviews with the various actors (OPGI, APC and property developers), or thanks to the questionnaire sent to the co-owners, allows us to remember that the spaces outside the buildings are common spaces that belong to all the co-owners and believe that they are responsible for their management (upkeep and maintenance). The observed reality of the physical state of the spaces outside the buildings does not correspond to the obtained responses, which means the disengagement of the co-owners, which consequently affects the management of these spaces negatively.

The correlation between the physical condition of the spaces outside the buildings, within the condominiums and the causes of their deterioration confirms that the physical condition of the exterior spaces is rather degraded. In fact, 83.2% of users believe that the situation of outdoor spaces is degraded, against only 16.8%, who believe that the condition is acceptable. According to 33.7% of users, the first cause of deterioration is the failure of upkeep and maintenance. Neglect and carelessness by residents is the second cause, according to 29.6% of users. 27.6% of dwellers believe that the quality of execution is the third cause. Only 9.2% of the population believes that degradation of outdoor spaces is due to vandalism.

The correlation between the physical condition of the spaces outside the buildings, within the condominiums, and the degree of satisfaction of the co-owners has shown that the inhabitants are rather dissatisfied. In fact, 83.2% of the inhabitants are dissatisfied, against only 16.8% who are satisfied with the physical condition of the outdoor spaces. We note that there is a relationship of dependence, which links the inhabitant's degree of satisfaction to the physical state of the outdoor spaces. The degree of satisfaction increases or decreases depends on the degree of degradation of the spaces outside the buildings.

Finally, we believe that the concept and purpose of the management of condominiums, in particular spaces outside buildings, as described in Algerian regulations, may not correspond to the lifestyle of the co-owners.

Hence, the need to look for other mechanisms to facilitate the involvement of co-owners in the design, construction, and management of these spaces has to be a priority.

Conflict of interest

The author has not declared any conflict of interest

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