

Spatial Quality in Collective Housing Transformations and Alterations Made by Residents of 50 Housing Units in Timgad

Sadeki Amal ^{*1}, Feloussia Lahcene ²

¹ Laboratory Child, City and Environment, University of Batna 1, amal.sadeki@univ-batna.dz

² University of Mohamed Boudiaf Msila (Algeria), lahcene.feloussia@univ-msila.dz.

Received : 03/11/2021

Accepted: 24/03/2022

Abstract: the alterations made in the interior design at the level of collective housing; is a widespread phenomenon at the level of the Algerian cities. These alterations are very varied in numbers and degrees at different levels. In previous research, several reasons for this phenomenon were found, such as to meet the differences between the granted housing and the real needs and also, lifestyle of Algerian households. The study of 50 social housing units in Timgad city raises questions about: how spaces are transformed in practice and used over time? And why do residents seek to transform the space they occupy at the collective housing?

This paper proposes as a study of this phenomenon, which has become a mechanism setting between housing and user, studying the causes and trying to find solutions to meet the needs of households. Then classify the reasons for these transformations for consideration in future designing.

Keywords: collective housing; spatial qualities; social practice; transformation; the usability of space.

Introduction

From the cave to the contemporary habitat, the house or dwelling has always been the key space of human life. Housing is the starting point of all social life, whether it is at the intersection of economic, political or social, by providing housing for each household, stabilize the human by giving meaning to his life (Hamidou, 1989). The Universal Declaration of Human Rights recognized in 1948 the right of every individual to decent accommodation. Everyone has the right to a suitable size of the accommodation, which meets the standards of hygiene and comfort and which preserves personal and family intimacy. The right to housing is a fundamental human right, recognized in many international and regional texts and several national constitutions or laws.

Housing is a means of integration into society. Housing is the place where people need to feel at home; they take possession of it and express their personality; they can identify with them optimally (Frommes, 1980). For humans, housing is suitable if the expression of their cultural identity is respected and taken into account because they seek their well-being and seek to express their personality in their own sphere. To inhabit a dwelling is no longer merely to occupy space but to make a world, the projection of the individual's inner world on space. Any landscaped space has physical and functional features that more or less adequately meet the needs of the groups it houses. Housing is not only a shelter function but more to allow everyone to express his individuality, the ability to feel at home, to create a special relationship between a place and an identity.

The inhabitant acts on their space, and the house influences the inhabitant, both are changed in the process of appropriation, and the result is a new way of living and a new space. Then, it is an interaction between the individual and the environment. Spaces with a low projection of identity or history do not allow feeling «at home». Therefore, from observations of our daily environment, Algerian society, like all societies, acts depending on the space it occupies; it appropriates and

* Corresponding author

transforms space through its different values. It is from this interaction between the inhabitant and the space, will be sought in this paper.

Collective Housing was one of the solutions adopted by the Algerian government. They saw this way as the most suitable and the requisite solution because it is the type that could shelter the maximum number of families, which was carried out more quickly and is relatively economical. This solution to the need for housing has been based only on quantity since independence. But in qualitative terms, the problem remains. According to an observation of the different collective housing in Algerian cities, several types of transformations had affected the physical aspect of the housing and its immediate exterior space; and they are very varied in numbers and degrees at different levels. These transformations raise questions about: how spaces are transformed in practice and used over time? And why do residents seek to transform the space they occupy at the collective housing level?

Living in a home is no longer just about occupying space but about making a world, a projection of the individual's inner world onto space. Humans seek to express their personality in their private sphere through interactions; they transform space through different levels of modifications because we have noticed that the design of collective dwellings does not consider the values of the Algerian society. Moreover, the need for more surfaces motivates the residents to transform space.

The main objective of this research is to understand the relationship between users and their spaces. In addition, to studying the phenomenon of transformations that affect the interior design of the houses. Then classify the reasons for these transformations for consideration in future designing.

1. Methodology and Materials

To achieve the objectives previously defined according to the following methodology, certain means and techniques are necessary and even indispensable. The bibliographic work summarized the reading and consultation of all kinds of documents such as; books, articles, theses and codes related to this subject. Fieldwork achieved the analyses of the houses on the one hand through the production of surveys, plans, sketches, photographs, and on the other hand, the questionnaire. The questionnaire targeting users is the most effective way to identify the maximum amount of information and, this allows a better understanding of the problem. The 25 questionnaires distributed, collected and interpreted intended to obtain a broad range of quantitative data about the flats, number of rooms, areas of rooms, occupancy rate, flat's alterations made. In addition, Excel sheets and databases are used to generate the graphs.

1.1. Selection criteria for samples

The apartments constituting the sample were selected according to four defined criteria.

Design

This is the first criteria to consider; we tried to have multiple plans. The selection is made based on several apartments in each block, it is necessary to choose different blocks in design and angles to get different designs of the same typology.

Typology

trying as much as possible to vary the typology of apartment chosen, from one room to three room. These same typologies present very varied surfaces for each space.

Accessibility to information

this is a very important criterion because the choice of apartments was guided by the accessibility of the information provided.

Degree of transformation

At which point the transformation does influence the initial design of the dwelling? Therefore, apartments with different degrees of transformations were selected.

2. The Theoretical context of the study

2.1 The concept of the usability in architecture

The space is one of the architectural properties and the architectural space expresses the condition of this three-dimensional, through the man possibility of entering and moving himself in this interior (Bittencourt M.C, 2015). The usability concept of built environment, was first discussed in the treatise entitled "De Architectura", at the beginning of the Roman Empire, in which Vitruvius describes on three qualities served by architecture systems: "firmitas, venustas and utilitas" - "solidity, usefulness and beauty".

Use in architecture is an occupation or use of places, but this definition remains too vague and needs to be clarified. The concept of use gives an essentially instrumental meaning to the practice of space: the latter assumes, from there, an almost unique purpose, excluding a whole set of ancillary qualities which accompany the strict use.

Use, even more than use, supposes, on the contrary, a producer, not the passive individual to whom the space is intended, nor the human element to which the building or the place designates a function, but a producer of space, repeated and complex acts taking place in space. Thus, the conventions, as a set of practical arrangements and material devices on which a social significance is established, constitute the minimum requirements of arrangement allowing the architect to conform more or less exactly the space, in its different dimensions, functional and aesthetic, to an expectation that is not always explicitly formulated by the inhabitant.

2.2. Spatial quality

One of the most crucial categories of spaces discussed in the design process in architecture is dwelling space. These spaces are interpreted as a reflection of the user, one of the exclusive qualities of the dwelling spaces. All the hopes and dreams of the architect, beliefs and concerns about the user's needs are reflected in these spaces and constitute the main structure of the spatial characteristics.

Spatial quality becomes a meaningful concept only when related to the space's uses; this is not to deny that there may be uniform regularities over long periods and in many different cultures (Amos Rapoport, 1970). The result of the literature study on spatial quality reveals that spatial quality consists of the interrelation between four determinants: (1) views, (2) internal spatiality and spatial arrangements, (3) transition between public and private spaces, and (4) perceived, built and human densities (Acre and Wyckmans, 2014). The main topics of this spatial quality determinant are:

- Articulation between space and its boundaries, and between adjacent spaces.
- Privacy within the dwelling (zoning considering different groups within the family).
- Light (access of daylight, layout zoning, and sun orientation of openings).

2.3. Transformation

The notion "transformation" is a notion rarely defined in this perspective, and to transform according to the Larousse dictionary "is to change the form of a thing, to modify it" is often treated by researchers under the term appropriation or alterations. The transformations in our research mean; all modifications made by users to their accommodation space in the interior design.

In architecture, the phenomenon of transformation is synonymous with the appropriation of space which in turn is the result of a conflict between human needs and space, and we cannot say that there is appropriation without that there is this conflict between the user and the space.

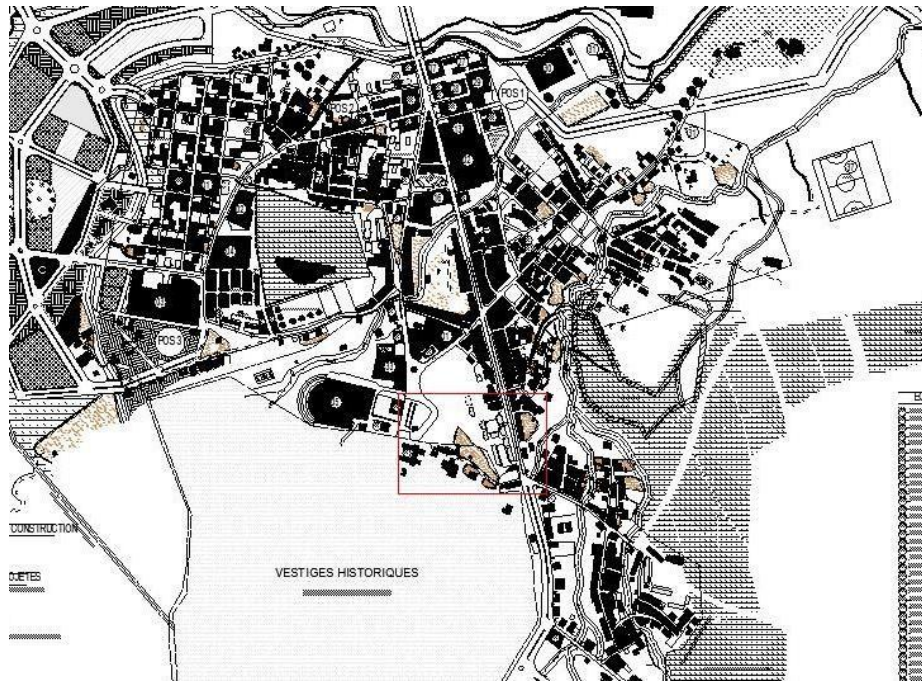
Needs are elements that generate transformations, according to Maslow, a person's motivations are the result of not being satisfied with some of their needs. This enabled him to classify these into five hierarchical levels in order of importance. The principle of hierarchy applies to the famous pyramid of needs. A new (higher) need only emerges when lower needs have been relatively satisfied. This hierarchy means that man only attains his full development if he is satisfied on the planes: physiology, security, belonging, esteem and self-realization.

3. The study area

3.1. Presentation of the case study

The case chosen represent a synthesis of all the conditions sought; it is collective housing which all underwent transformations and physical degradations, it is in the city of Timgad (50 housing units). Timgad is a city in the North-East of Algeria, located in the wilaya of Batna in the Aurès. The modern city of Timgad, located on the outskirts of the ancient city of Timgad, 35 km east of Batna and 68 km west of Khenchela. Moreover, the town of Timgad occupies a strategic location, it is crossed by the RN 87 and 88 and is at the crossroads of these two major axes.

Map.1. Timgad city map



Source: PDAU of Timgad city, 2013.

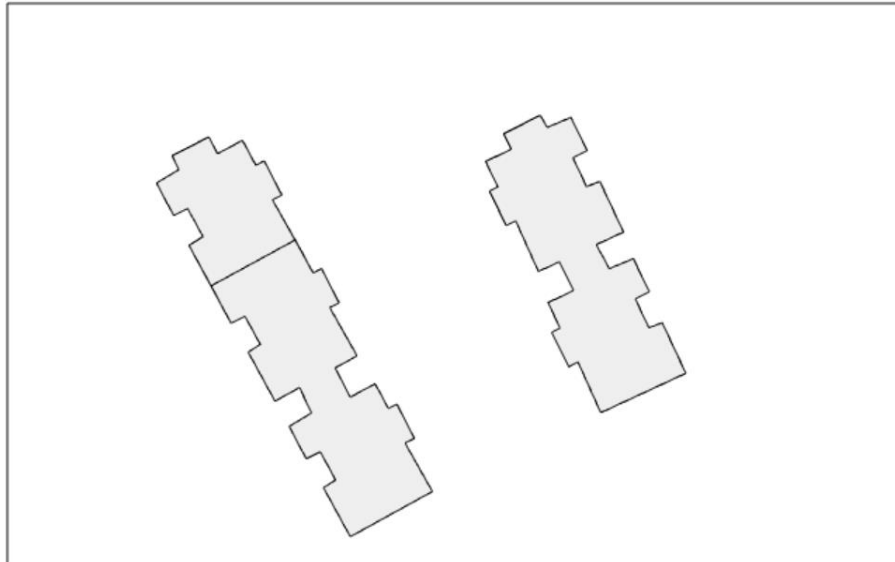
Fig.1. 50 housing units



Source: Google Maps, 2021.

It is a collective housing estate of a social nature, supported by the OPGI of Batna. The start date of the construction works of the project is set for: 12/18/1999. The lead time lasted 4 years, until 2003. The city of 50 housing units is located northwest of the city of Timgad. The dwelling is characterized by a good geographical situation in the city, seen its situation near the main road (national road RN87), also near to the archaeological site (the Roman ruins).

Fig.2. blocks shape



Source: Authors, 2021

There are 5 rectangular shaped blocks, they are aligned, coded as BlocksA, B, C, D and E. Each block sampled consisted of 8 flats served by public staircases, each of which give access to two flats on each floor.

Housing is a functional unit where the organization of space meets the cultural standards of society, but the size, shape, internal organization, equipment are also linked to the structure and to the economic and social level. In our case study, the spaces of the housing units surveyed fall into three categories: Main spaces, secondary spaces and the other components. And in each block, we find three typologies of the apartment; (F3, F2, F1).

Table 1. Typology of dwelling units

Type	Typology of dwelling units	Spaces	Surface (m ²)
1	Three Rooms	2 bedrooms, living room, kitchen, bathroom and wc, Loggia, drying space, hall	60
2	Two Rooms	bedroom, living room, kitchen, bathroom and wc, Loggia, drying space, hall	40
3	One Room	Living room and kitchen, bathroom with wc, Loggia and drying space	30

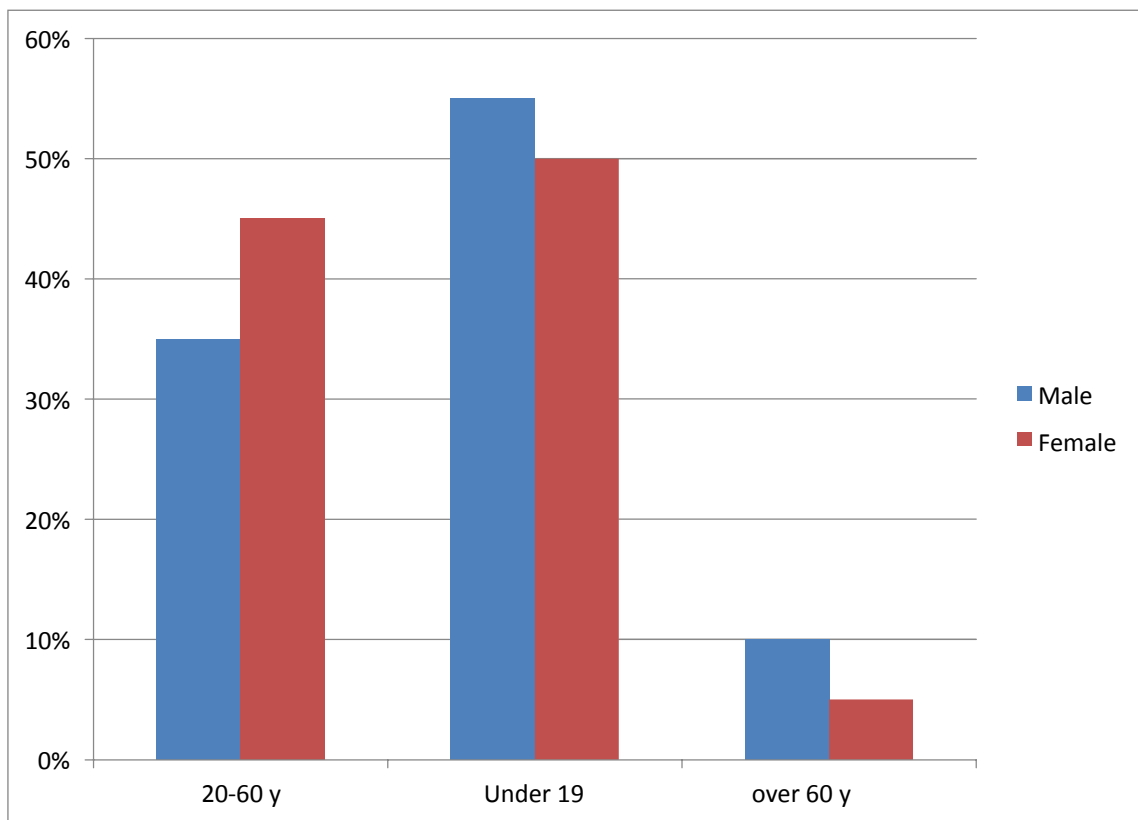
Source: Authors, 2021

3.2. Household characteristics

The occupants of the flats are nuclear families (marriage partners and their children); Only one example has been found of a single man living alone. The survey results of households are illustrated in the figure below. It noticed that the age group under 19 years is the most important

category, with a percentage between 50 and 56%. Then comes the age of 20-60 years with a rate of between 35 and 46%. On the other hand, the group aged over 60 years with a percentage between 5% and 10%.

Fig.3. Household composition



Source: Authors, 2021.

3.3. Alterations made by residents

This enumeration consists of an inventory of all transformations carried out by the users in their dwellings. The plan types examined showed that there were several kinds of transformations made by the families to satisfy family needs. There are light works and made to improve space use, security of the dwellings, for maintenance and repair, and to enhance the aesthetic quality; these alterations were made by all families. The second was substantial and weighty alterations for the internal extension of spaces by removing load-bearing walls. They were made by 90% of families. Figures (4 to 7) show some of the layouts of flats that underwent alterations depending on their typology. Then these transformations will be classified.

3.3.1. First plan type 1 (Three rooms)

40% of families had expanded their hall space by the addition of bathroom space and they transformed the drying space into a bathroom. 60% made no changes except light transformations to improve space, works of repair such as painting, coating, glazing, and sealing. See (Fig 4)

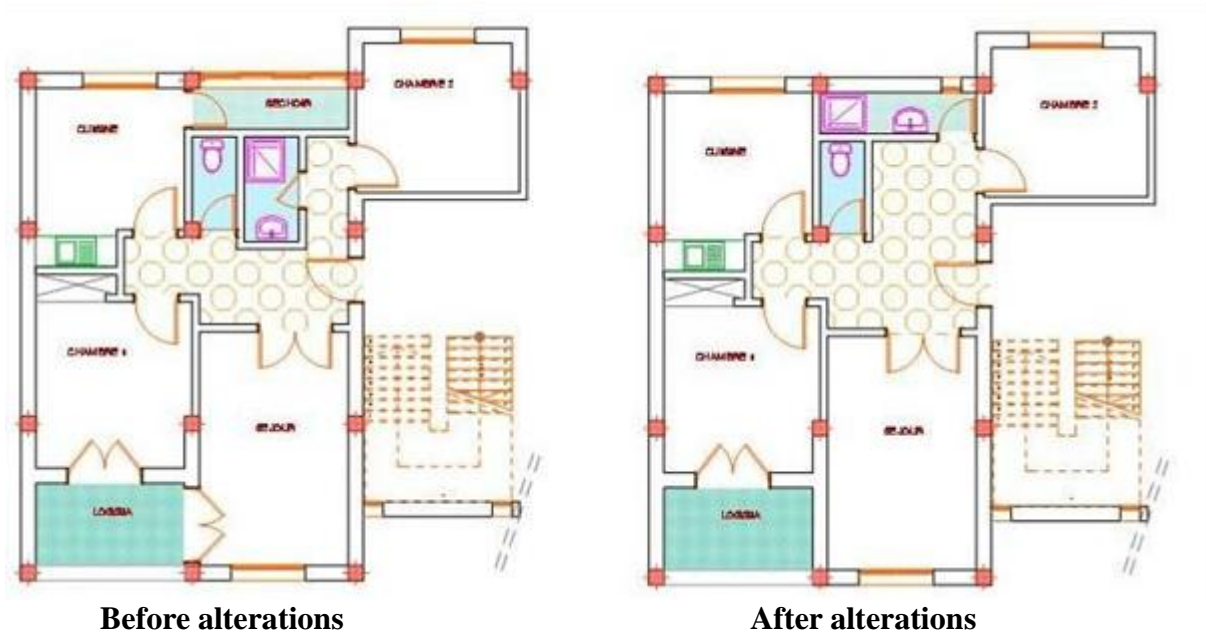
3.3.2. Second plan type 2 (Two rooms)

90% of dwellings made significant changes, they had the conversion of kitchen space into a bedroom and the conversion of the bathroom and drying spaces into kitchen space, creating the bathroom in the storage place. Also they adding a loggia space, enlarging bedroom space. Load-bearing and façade walls have been partially removed and changed. See (Fig 5)

3.3.3. Third plan type 3 (One room)

100% of dwellings had converted the kitchen space into a bedroom and had converted their drying space and a bathroom space into a kitchen with a small bathroom. The surface of this dwelling type is tiny and it didn't suitable for families. There are two type of this typology (with loggia and without loggia). See (Fig 6 and 7)

Fig.4. Plan type 1



Source: O.P.G.I of Batna, modified by Authors, 2021.

Fig.5. Plan type 2



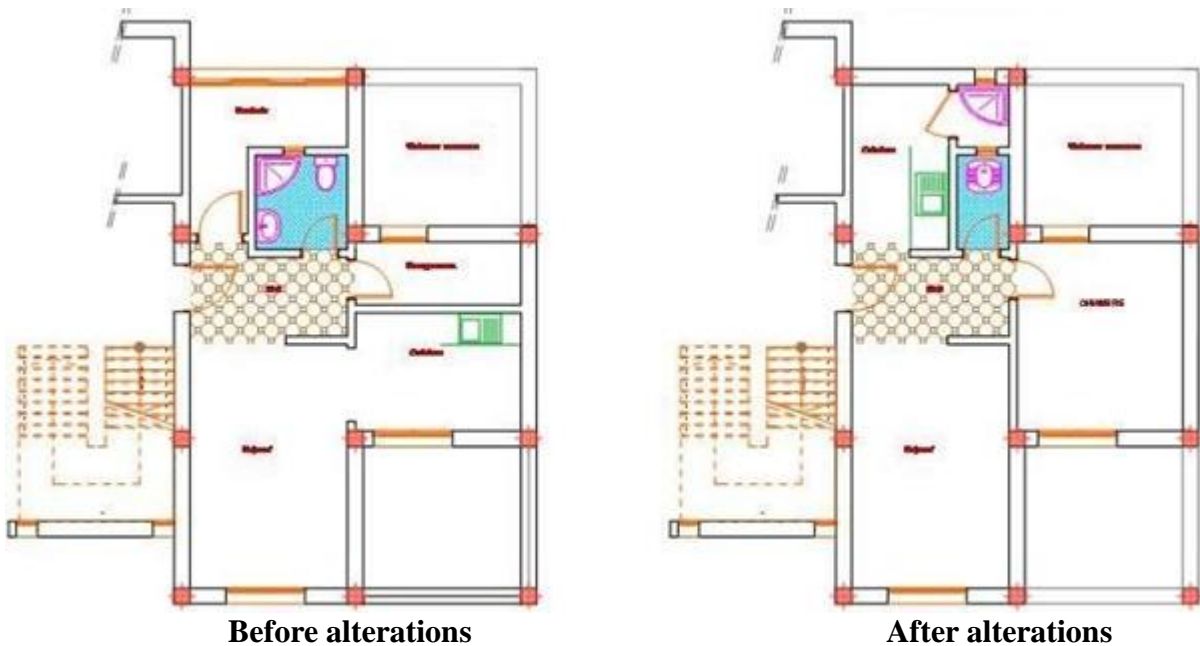
Source: O.P.G.I of Batna, modified by Authors, 2021.

Fig.6. Plan type 3 with loggia



Source: O.P.G.I of Batna, modified by Authors, 2021.

Fig.7. Plan type 3 without loggia



Source: O.P.G.I of Batna, modified by Authors, 2021.

4. Results and discussion

4.1 The reasons for these transformations

The users have their perception of living in the house. Alterations are necessary to interact with the space, and through these interactions, they seek to find a better correlation between their needs and their lifestyle. An observation from the survey is that many households had changed the dwelling before they occupied it; because they Built preconceived ideas about their houses. Therefore, they want to design it according to preconceived image and, they do not occupy the flat

until the end of the alteration's works. So, for these users, the alterations made do not correlate with the lived experience, unlike others where the alterations solve the problems experienced in their houses.

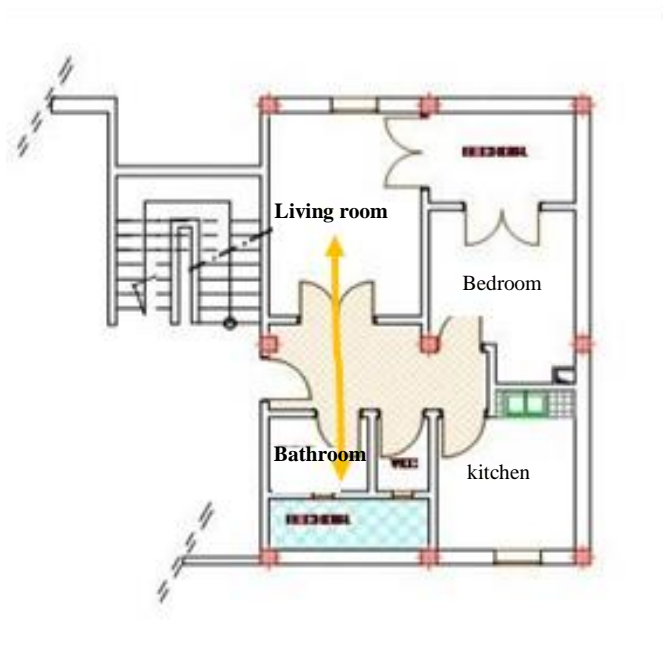
4.1.1. Preserve socio-cultural values

The dwelling cannot be treated as a space dissociated from the social and cultural values of the occupants, but in close connection with the neighbourhood as a container and with the inhabitants as a content, although social and psychological needs are more complex given the difficulty of determining and defining them as clearly as physiological needs with scientific means and even their variability over time. This means that when designing housing, it is necessary to think about the perception of the city and the image that this housing must give to the urban landscape, in the same way, it is necessary that the inhabitant finds his image and feels his identity for allow it to adapt better. The inhabitants have made several transformations in the flats interior design and, they are solutions to preserve their socio-cultural values and to feel their identity through the design of their houses. 25% of the inhabitants made this type of modification to their flats interior design.

noticed in several dwellings the position of sanitary spaces near or in front of the living room and, this design does not take into account The social and cultural values of Algerian society. See (fig 8) The transformations which concern the creation or the suppression of the relations or of the direct contacts between the various spaces giving subsequently spaces communicating or not; for example :

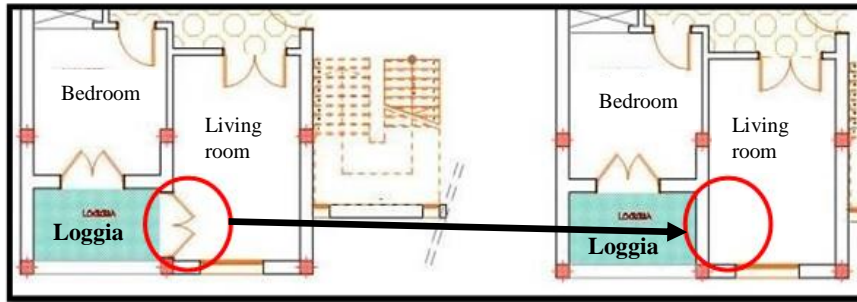
- They Favour the direct relation between room and loggia than that between the living room and loggia. See (fig 9)
- For a shared bathroom, some users prefer the separation and the creation of two distinct spaces: WC and bathroom.

Fig.8. Plan type 2 before alterations



Source: O.P.G.I of Batna, modified by Authors, 2021.

Fig.9. Suppression of relations between spaces



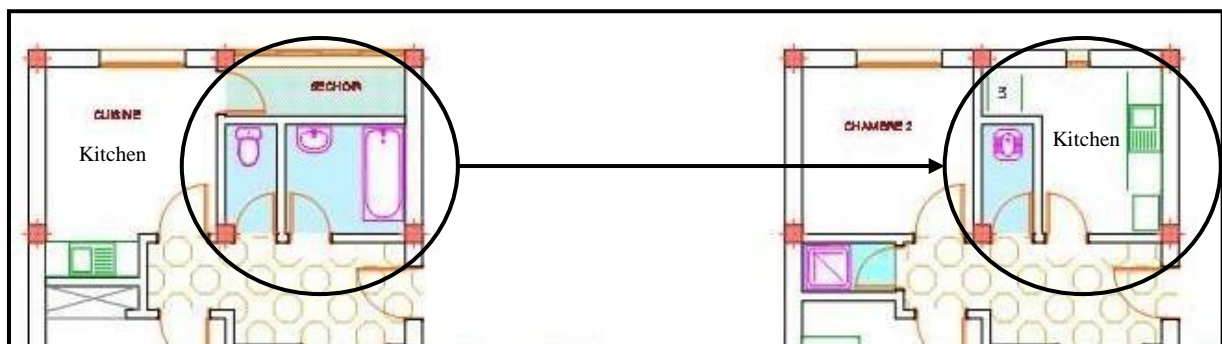
Source: O.P.G.I of Batna, modified by Authors, 2021.

4.1.2. The need for more surface

When the family increases, they seek more space and more rooms, especially for the separation between girls and boys. So they do a functional change of spaces, This concerns the change of initial activity attributed to any space which will take a new assignment after the transformations, examples:

- The dryer space transformed into a kitchen or a bathroom.
- The kitchen has become a bedroom.
- The bathroom with the loggia is transformed into a kitchen.

Fig.10. Changes in functional aspect

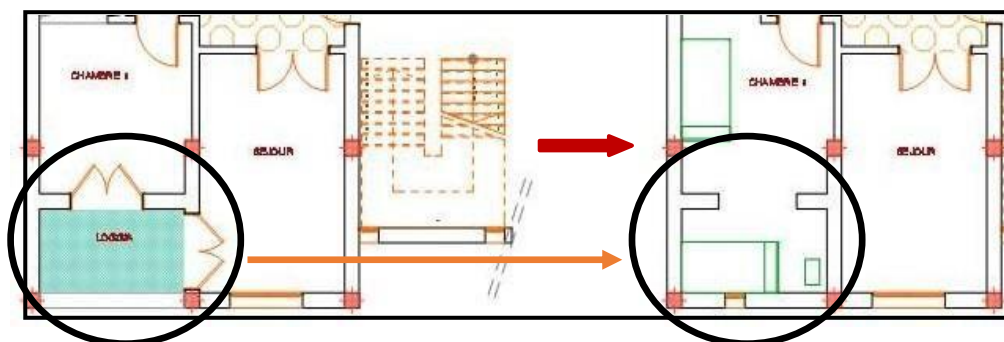


Source: O.P.G.I of Batna, modified by Authors, 2021.

Incorporation of spaces, these are the transformation which result in an increase in the surface area of one space at the expense of another; such as :

- The incorporation of the balcony / loggia in the surface of the bedroom or that of the living room.
- Incorporation of the dryer space into the kitchen surface.

Fig.11. Incorporation of new space



Source: O.P.G.I of Batna, modified by Authors, 2021.

As would be expected, the transformation has resulted in significantly more space per household in the two-roomed flats than was available originally.

4.1.3. Alterations of Correction and Repair

The alterations of correction and repair are justified by improving the quality of spaces and integrating modernity into collective housing and also by meeting aesthetic needs.

Correction and repair the faults of the initial state, at the first occupation, the flats are presented with production defects: poor finish, degraded paint and plaster, poor quality of the carpentry, lack of glazing, leaks and water infiltration, electrical failures, etc. So these are works carried out mainly for the correction, repair and change of anything that does not work.

The use of new and expensive materials, are replacement work with expensive materials such as floor slab, marble, very good quality carpentry. All changes for aesthetic reasons are interior decorations and this category of changes (interior decoration) has the highest percentage compared to other changes. This kind of change is quite normal. These modifications are considered flexible and do not have an impact on the exterior.

90% of the changes were noted for the interior decoration. They materialize in the covering of the walls, the painting, the tiling, the grooves,... all works which aim at the decoration.

4.1.4. The non-use of space

The dryers, loggia, storage are non-exploitable spaces, so the inhabitants transform these spaces by:

- The demolition of the walls separating the kitchen and dryer / loggia or the bedroom and dryer / loggia.
- Assigned its surface to other spaces (change of function).

Fig.12. New window created by the residents



Source: Auauthors, 2021

4.1.5. Safety reasons

These are works which consist in the protection of all openings leading to the outside. To protect the windows, the inhabitants use various elements, The use of louvres, guards and barriers.

To feel safe 90% of the inhabitants are carried out work which consists of protecting any opening leading to the outside, by installing a metal door for access, blinds for the windows, bars, raising the guards for balconies and dryers or the complete closure of these spaces.

“positive space is an enveloping space, closed which is qualified making safe, it is opposed to the unbounded external open space which is the negative space and which is consequently insecure.” (Cousin, 1980)

Conclusion

The phenomena described in this paper are not limited to the case study but can be found in Algerian cities in general. Much research has already been conducted on these alterations and transformations at the level of the internal layout of collective housing, resulting in proposals for sites and services that are extendable to facilitate these alterations without affecting the exterior facade. The residents develop forms of appropriation in their dwelling. They transform its design through different ways to meet their needs. Users still materialize traditional socio-cultural models through spatial occupation and alteration strategies and the functions given to appropriate dwellings. It seems that we are experiencing a new mutation at the level of the layout of the flats in collective housing, and it's a reflection of today's society in the way it constructs its living space.

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