



# Tafilelt, the Neo Traditional Model of Ksour in Algeria: Assessment of the Multi-functionality of Urban Spaces

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## ARTICLE INFO:

### Article history:

Received 06 May 2018

Accepted 25 June 2018

Available online 12 October 2018

### Keywords:

Tafilelt;  
Multifunctional Urban Spaces;  
Neo Traditional Model;  
Algerian Ksour.

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## ABSTRACT

*The new ksar of Tafilelt situated in Ghardaia in southern Algeria has attracted a lot of interest in scientific work, being a « neo traditional » urban model that reproduces the principles of composition and spatial organization of the ksour in the pentapolis of Ghardaia. This ksar embodies the adaptation between tradition and modernity: it refers to the local setting of the ksourien space production, contribute to the valorization of these ancient centers that date back to the XIth century.*

*In parallel to the work of thesis undertaken on « the neo traditional models of reference in Algeria for the new cities », we ask the following questions according to the case of Tafilelt: Is this ksar really a model? Does it take the traditional model fully? Is this indeed a new city? In addition, speaking about the concept of multi-functionality. How to detect this integral reproduction in the urban spaces between the old and the new ksar?*

*This work will be an analytical reading of the spaces of this ksar according to the four concepts above, namely: the urban model of reference, the criteria of the new city, the criteria of the former ksour and the multi-use character of their spaces. We will try to apply the concept of multi-functionality on urban spaces in different scales to assess the multi-functionality of the ksar's spaces in a comparative approach between the old and the new ksour.*

JOURNAL OF CONTEMPORARY URBAN AFFAIRS (2019), 3(2), 99-107.

Doi: <https://doi.org/10.25034/ijcua.2018.4706>

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## 1. Introduction

The M'zab Valley in Algeria contains the most ancient urban centers in the world. The Ibadite Muslims have built these fortified cities in the XI the century after running of the Rostumids from their original settlement in western Algeria (Marçais, 2004). They tried to get along with the hard climate in the Sahara and kept the ksar's houses for winter and the palm grove's houses for summer (Addad, 2012). The Mozabite built the ksour in the slope of the M'zab River to protect them from the floods. Each ksar has several entrances and surveillance towers, a

mosque in the top and a marketplace (Souk). The UNESCO listed them in the world heritage since 1982 (Bouali-Messahel, 2011).

Since the 1990s, the Algerian government constructed new ksour beyond the old cores for many reasons (Gueliane, 2014):

- Treat the crisis of housing due to the

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increasing number of population.

- Improve the conditions of the framework built.
- Protect the cultural and natural values of the tangible and intangible heritage of the Valley.
- Have access to housing to the average class of Mozabite.

These ksour have a modern spatial organization, different from the local typology in adaptation with the specific conditions in Ghardaia. The introduction of the modern lifestyle recently participates in a standard composition in new housing and the new built up areas seems to be similar in the north or the south of Algeria, which leads to a lack of the local identity in the architectural and the urban scale.

The local foundations or the Mozabite themselves, fighting the loss of their model of reference, tried to build new cities that embodies the adaptation between tradition and modernity. It is the case of Tafilelt, it reproduces the traditional urban model of ksour, this study attempts to assess the multifunctionality of spaces in the new ksar according to the traditional model.

The figure 1 is illustrated the structure of the study about the urban models in the M'zab Valley and its importance to preserve the local heritage of this ancestral region.

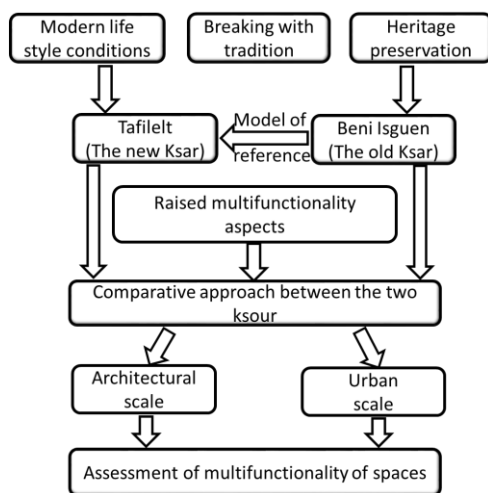


Figure 1. Structure of the Study (Developed by Author).

## 2. The Neo traditional urban model in Ghardaia (Algeria)

The first part of this study will attempt to present Beni Isguen as an urban model and Tafilelt as the modern adaptation of the fortified ancient city and will demonstrate that the former ksour were an urban model for the new ones.

Ghardaia is a well-known region in Algeria, since Marc Cote and André Ravéreau (2003) up to present, its ksour have fascinated many architects and planners who wrote on the M'zab and were inspired in their achievements. The M'zab is a Muslim community of the very conservative Ibadite Sect. They always have a tendency to build and go live in a new ksar if the former is no longer enough for the new population. The descendants of the same tribe will then build the extension of their own city. This community has since long respected a "sustainable" lifestyle: wise recycling of household waste, use of local building materials and economical use of space. These criteria have advanced the work on the multifunctionality because density and multi-use space go together. The pentapolis contains five former ksour: El Atteuf built in 1012, Melika in 1350, Bounoura in 1046, Beni Isguen in 1347 and Ghardaia in 1048 (OPVM, 2017). The Algerian Government named the entire city after the last one. Guerrara built in 1631 and Beriane in 1679 are located in a few kilometers from the pentapolis (Chabi, 2008). The new ksour are Tinemmirine in 1992 and Tafilelt in 1997 fully completed and Thaounza (2004), which are the extension of Beni Isguen. The ksar of loumed built in 1995 belongs to Melika, Tineaâm built in 2008 was annexed to Bounoura. Finally, the ksar of Hamrayat built in 1996; Agherm Ouazem in 2007 and Ayrem Babaousmail in 2008 were located outside the Valley, belonging to the municipality of El Atteuf (Gueliane, 2015).

### 2.1 The new ksar of Tafilelt

Tafilelt is a project initiated in 1997 by the "Amidou" Foundation, completed in 2011 on an area of 22.5 hectares, it contains with the 1050 housing units intended for Mozabite young couples, non-existing equipment in the former ksour: Gym, party hall, madrasa, cultural center and an ecological park (Gueliane, 2014). The mode of funding to build the houses is tripartite between the government, the foundation and the population. Therefore, Tafilelt is not a new town, the foundation didn't build it after a governmental decision and the laws, which regulate the new cities in Algeria, are not applied on this ksar. It is a purely an initiative from the foundation and the inhabitants. It is winner of the first prize of the "sustainable city" to the Conference of Parties (COP) 22 in Marrakech, Morocco in 2017. This ksar is the extension of the ksar of Beni Isguen. One of the objectives of Amidoul

Foundation in the project was the reinterpretation of the principles of urban planning in the local traditional housing (Addad, 2001b). The Intergenerational mix is also one of the element keys of the house design in Tafilelt, it can accommodate two to three generations (Addad, 2001a), we found after the distribution of the housing that the social mix is rather absent in this project (Gueliane, 2014).

## 2.2 The old ksar of Beni Isguen

Beni Isguen is the fourth fortified city in the M'zab Valley, known by its ancient mosque and its battlement of 2500 meter of length and three meter of higher including two principal surveillance towers: Boulila and Badahmane (OPVM, 2017). Its population is characterized by quite strict behavior rules and morals (Bouali-Messahel, 2011).

Like the other ksour, Beni Isguen contains an important marketplace where the commercial transactions were organized weekly; it was one of the rare opportunities where Mozabite allow to strangers to come into the city. The commercial streets contain the daily activities (hairdresser, greengrocer and grocery store). The houses are the most important component of the ksar, closely positioned to avoid the winds, built in gradient in the slope of the valley from the bottom until the top where the mosque is symbolically situated. It constitutes one of the last traditional ksourien model built by the mozabite.

In his book "A city fulfills its Valley: Ghardaia " Marc Cote (2002) said that the ksar is a module that is reproducible, organized in trilogy between the river, the ksar (the winter's settlement) and the Palme grove, which is the summer's settlement where the presence of the freshness mitigates the heat of the Sahara. Each module is independent and limited. The extension of each former ksar by a new and the description of Marc Cote confirm that the M'zab Valley has well and truly, a reference model reproducible for its new cities.



Figure 2: Situation of the two ksour with the distance between them. (Chabi, 2008)

According to Nora Gueliane, Tafilelt shares with Beni Isguen the same principles of planning to know: the compactness, templates, the prospect and the integration to the site. We are going in this work to take interest to the first principle of the "economical consumption of space" which logically generates the principle of multifunctionality of spaces. During the construction of Tafilelt, some urban problems have been resolved thanks to the traditional urban planning.

However, the constitution of the ksar of Tafilelt demonstrates that this new urban model aspires not only the protection, the enhancement and the sharing of the ksourien heritage; it also revisits these cultural values for an adaptation to a more modern life framework.

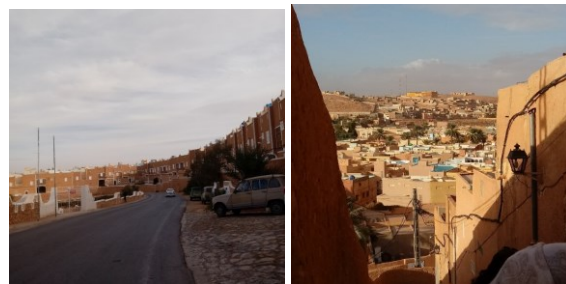


Figure 3: General view at Tafilelt at left and Beni Isguen at right (Author, 2017).

The table 1 attempts to compare between Beni Isguen and Tafilelt according to several elements both in architectural an urban scale. This information has been gathered during the visit to Ghardaia in December 2017 from documents provided by the architects who work in the OPVM (Office for the Promotion of the M'zab Valley, 2017). See table '1', in Appendix 'A', and this comparison provides us the following information:

- At an urban scale, Beni Isguen was a model of reference to Tafilelt in the site choice and implantation. The new settlement could protect the rare agricultural lands in the Valley from urban sprawl and because of the economic situation of its inhabitants, it has been yearly occupied and more appropriate for the modern lifestyle. It is also a way to guarantee a multifunctionality of land use. The urban landscape was respected because it refers to the model of reference and the ethics of Mozabite, the homogeneous height and colors of facades reflect equality between families.

- The main streets in Tafilelt are wider than in Beni Isguen. In fact, each household has a car in the ksar, the large dimensions of the streets guarantee a mechanical accessibility.
- There are many places in Tafilelt dispersed between the neighborhoods unlike Beni Isguen where a main place was the public space for all users.
- At an architectural scale, and thanks to the social cohesion between the Mozabite, Beni Isguen still a model of reference to Tafilelt with an adaptation to the modern lifestyle, the differences between Beni Isguen's houses and Tafilelt's houses are minimal (the existence of a garage and a yard in the new houses).
- The neotraditional house is more spacious and occupies the whole first floor; it also contains a laundry room in the terrace. At the end, we may conclude that Tafilelt is a neo traditional urban model of ksour in Algeria even if it is not a new town; this ksar could preserve the traditional model in either the architectural or the urban dimensions with a successful adaptation of the current life framework. It reproduces symbolically some elements in order to maintain the heritage conservation. This project has broken with the current Algerian policy of standard housing. Therefore, one of the ancient concepts that Tafilelt maintains is the diversity of its activities in a limited space. Inside the ksar, the inhabitants tried to project all their needs in order to create an urban diversity and a functional mix.

### 3 Assessment of multi-functionality between the ksour of Ghardaia

The second part of the study approaches the concept of multi-functionality in general and in the two ksour of Ghardaia in particular in order to assess this concept between the traditional and the neo traditional models.

Multifunctionality as a concept has several roots (Ghafouri, 2016): some authors consider it as an old architectural concept in urban areas by relating it to the ancient Greek or medieval constructions (Zeidler, 1985), others consider it as the ability of spaces to fulfill more than one function simultaneously (Grant, 2010).

The concept of the mixed and compact town appears with the "smart growth" in the United States at the beginning of the 1990s, it emphasizes on diversity of use and urban functions with the creation of a favorable environment for pedestrians. This concept had an echo in Europe and with a Dutch then a German evolution that it becomes the "urban

multifunctional land use MLU" or the concept of multifunctional use of urban space. It was inspired by the agriculture field where it was largely applied to increase the rural production (Dufour et al., 2007). It encourages a model of a compact city with diverse functions especially with a synergy between the proposed functions (De Groot, 2004). Recently, MLU inspires urbanists in sustainable urban planning because it breaks with the zoning design of the modern style, cause of the urban sprawl (Jacobs, 1961). This concept has also other benefits: reduces the need for new constructions, increases the density in urban areas and leads to more cities that are vital economically and socially (Batty et al., 2003).

The assessment of MLU in urban spaces uses the aspects below (Ghafouri, 2016):

- Space: which is the most important topic; the study area is a place, a street, a building, a house, a room, a terrace or even a sidewalk. It could be open or closed, public or private.
- Time: in architecture, an activity occurs in a time framework (Ghafouri, 2016): during the day or the night, during a week, a month, a season or all over the year.
- Function: a space could have various functions; we can distinguish different types of activities that occur in a space: necessary and functional, optional or social activities (Gehl, 2011).
- Users: the people that are occupying the space could be recognized according to their gender (men or women), or age (children, young or elderly person).
- Scale: Basically, there are three scales in urban studies: architectural scale (the building analysis), neighborhood scale and urban scale (at the level of a town or city).
- Legal status: it refers to who owns the concerned space; this could give us an idea about the importance, accessibility and flow of a space.

In fact, there is a close relationship between time, space and function to characterize the multifunctionality. For this reason, we will consider those three aspects in addition to users to assess MLU in the two cases. We already divide the study according to the scale and will mention, but not consider the legal status.

#### 3.1 Multifunctionality in Beni Isguen

Like other ancient cores, Beni Isguen is compact with a mixed uses. This returns to the climatic conditions of Ghardaia in one hand and the principle of land economy in another

hand. The table 2 studies the aspects of multifunctionality in the old ksar in the most important and significant spaces. We will consider each type of space according to the degree of its multi-use:

- A functional space is considered with the sign (0) because it does not contribute to the multifunctionality of the ksar. However, it has a function, few users and one occupation time at a long period (week, month or season).
- A multifunctional space is considered with the sign (+) because it has more than one function, attracts different types of users who occupy it in different time a year.
- A mono functional space is considered with the sign (-), this kind of spaces have only one function intended for one kind of users and rarely occupied.

The study will not treat in an exhaustive manner the gradation of each degree of multifunctionality for the amenities of the presentation. The next table represents the different ksourien spaces with a description of their aspects. See table '2', Appendix 'A'.

### 3.2 Multifunctionality in Tafilelt

Tafilelt follows an orthogonal tracing, hierarchical wider ways with compactness due to the land economy. New equipment appears in the new ksar and the mosque always keeps the summit of the ksar.

The table 3 resumes the same aspects with the same considerations mentioned above in Tafilelt architectural and urban spaces. See table '3', in Appendix 'A'.

### 3.3. Results

This study shows that the logic behind the construction of the traditional cores is implied. A ksar is always a reflection of deep social, cultural and religious values. The intention to separate between the architectural and the urban scale was hard in this case because the traditional design thinks simultaneously the micro and the macro scale. It is a complex thought that users practice to build their settlement long time ago, different from the linear planning of towns nowadays.

Tafilelt respects integrally the traditional model and reflects perfectly the multifunctionality of its spaces mostly in the architectural scale using the same spaces: patio, terrace, reception rooms, and kitchen with the same traditional concept.

The neo traditional ksar has indeed mono functional spaces like the cultural center and

the madrasa who were included in the mosque in ancient times. The yard, the garage and the laundry room in the house have one function, previously, their activities were practiced in the patio.

Fortunately, in urban scale, Tafilelt was a multifunctional neo traditional model:

- The annual occupation densifies the ksar with multiuses and protects the palm grove from urban sprawl and consumption of agricultural lands.
- The reuse of symbolic elements like the surveillance towers also increase the multifunctional land use after their occasional use.
- The introduction of new equipment helps reach the intense land uses in a limited space (inside the ksar's limits) and an adaptation of the modern life (the ecological park, the gym for young and children).

## 4. Conclusions

This work tries to respond to the questions formulated previously, namely if the former ksour were urban models for the new and confirms the hypothesis, that Tafilelt is really a neo traditional model by its modern reinterpretation of the ksourien space.

In the first part of the work, we have demonstrated that Tafilelt is not a new city according to the Algerian regulations, but it takes Beni Isguen as an urban model of reference thanks to the social cohesion between the Mozabite who still respect their social and cultural heritage references. We have also been able to raise the criteria of multifunctionality of a space in the old centers.

In the second part, we checked the multifunctionality of spaces in the old and the new ksar in a comparative approach according to the raised and applied criteria of MLU in both architectural and urban scale.

These results showed that a neo traditional model could preserve the ancient advantages of the traditional model (the site choice, the implantation, the spatial organization in the traditional house, marketplaces and stores). It also develops some modern criteria and integrates them with the traditional advantages (the yard and garage in the house and the gym, cultural center and the ecological park, which is a leisure area and an opportunity to increase the agricultural land in addition to the palm grove)

## Acknowledgments

I would like to express my sincere thanks to Dr. BESTANDJI Siham, my Ph.D director for her time, help and support to accomplish this article and to Dr. Hourakhsh Ahmad Nia, chairman of the ICCAUA2018 conference, for all his help and understanding. This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors.

## Conflict of interests

The authors declare no conflict of interest.

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**Appendix 'A': Tables**

**Table 1.** A comparison between the old and the new ksar of the Valley (Developed by the author).

Comparison Elements		Beni Isguen	Tafilet
URBAN CHARACTERISTICS	Site	Generally, a land with weak agricultural opportunity, the ksar is perfectly integrated into its site, a responsible implantation inside the Valley.	Amidoul also choose a land with weak agricultural opportunity, the ksar is perfectly integrated into its site, a responsible implantation outside the Valley.
	Occupation	Seasonal occupation, the house in the ksar is only occupied during the winter.	Annual occupation, the households have average incomes and thus occupy the house during all the year (permanent habitat).
	Battlement and towers (Defensive elements)	Of a simple form, unified for all ksour.	The simple form is respected for the battlement; a tower is built symbolically for the seat of the Amidoul foundation.
	Doors	Five doors including two principal ones: the eastern and the western.	A principal door is built to symbolize one of the elements of the ksar, which takes part in the preservation of the traditional urban frontage.
	Streets, alleys and dead ends	Have only one function, which is the service road and cannot be occupied by another function.	Hierarchical streets larger than the reference model streets to allow the mechanical access.
	Mosque	Located in the western part of the ksar at the highest level.	It occupies the eastern part is of the ksar.
	Market	On a week, the public place is the market of the ksar. Stranger traders can get into to sell their products.	On a week, the public place is the market of the ksar.
	Places	The only public place in the ksar is a marketplace and a men's gathering place.	Several hierarchical places in the whole ksar to promote the social mix.
	Wells	Several water points are located in the ksar for water supply.	The wells are only symbolic elements in the new ksar.
	Urban landscape	Must be homogeneous in the height of the constructions, the colors of the facades and terraces.	Must be homogeneous in the height of the constructions, the colors of the facades and terraces.
	stores and commercial streets	It is forbidden to open a store for noisy activities or an activity that may generate waste inside the ksar.	They are located in the parties giving on the streets and the marketplaces and are not allowed to be in the heart of the llot.
	funerary mosques	Near to the cemetery, it is destined for the dead's prayer.	Non-existent in the new ksar.
	Residential space (houses)	An organic form and are almost all similar.	A regular form with three variants (three, four or five rooms in the house).
ARCHITECTURAL	The houses	Develop in two levels maximum and all their spaces are functional.	Develop in two levels maximum and all their spaces are functional and more spacious than the former houses.
	Entry	The entry creates an intermediary space for a separation between the inside and the outside, which may also be occupied in the summer because of its freshness.	A corridor communicates directly between the entry and the patio.
	Distribution	The ground floor is the space the most used by women especially during the day, the rooms are organized around a central space in the middle of the house, which is open in the ceiling (patio). There is a room dedicated for the reception of women and relatives. The first floor is more reserved for the newlyweds where its parts are organized around a covered gallery and thus gives access to the terrace and has a room for the receipt of men and of foreigners. This room can also be located on the ground floor far from women's daily activities.	The ground floor distributes the spaces from the patio; we also find a court and a garage. The first floor is closed and completely occupied by the rooms and gives access to the terrace.
	Building materials	Economical use of local materials (stone, palm wood and lime).	Introduction of the concrete and use of terracotta brick, lime, plaster and cement.
	Terrace	The terrace must be horizontal any other form is prohibited. It also includes a corridor reserved for household tasks in winter.	An open terrace and includes a laundry.
LANDSCAPE	Front and external openings	Must be similar and harmonious for all the ksar's houses, following a local typology.	They still belong to the public domain and must therefore be similar, harmonious and homogeneous. The openings are larger protected by moucharabiah.



**Table 2:** The analysis of the multifunctionality in Beni Isguen according to their aspects.

Scale	Spaces	Time	Functions	Users	Consideration
URBAN SCALE	Ksar	Seasonal occupation (winter)	Necessary/Optional/Social functions	All types of users	(+)
	Battlement and towers (Defensive elements)	Occasional occupation (of surveillance)	Necessary function	Young men who volunteer to survey the ksar	(-)
	Streets, alleys and dead ends	All day except afternoon while the inhabitants of the ksar stay at home	Necessary function	All users/ Women use often the alleys and dead ends more than main streets	(-)
	Mosque	Permanent occupation	Necessary/Optional/Social functions	Generally men at different ages and children	(+)
	Market	Weekly occupation	Necessary/Optional/Social functions	Generally men at different ages and children	(+)
	Places	Occasional occupation	Optional/ Social functions	Men/children	(+)
	stores and commercial streets	Permanent occupation	Optional/ Social functions	All users	(0)
	funerary mosques	Occasional occupation	Social function	Men	(-)
	Residential space (houses)	Permanent occupation	Necessary/Optional/Social functions	All users	(+)
Architectural Scale	Rooms	At night	Optional function	All users	(0)
	Entry	Occasional occupation	Optional function	Women at different ages, men use it as a passage	(0)
	Patio	Daily occupation	Necessary/Optional/Social functions	Women generally	(+)
	Terrace	Permanent occupation	Necessary/Optional/Social functions	All users	(+)
	Kitchen	Daily occupation	Necessary function	Women only	(0)

**Table 3:** The analysis of the multifunctionality in Tafilet according to their aspects.

Scale	Spaces	Time	Functions	Users	Consideration
URBAN SCALE	Ksar	Annual occupation	Necessary/Optional/Social functions	All types of users	(+)
	Battlement and towers (The seat of the foundation)	Daily occupation	Symbolic/ optional functions	The foundation members	(+)
	Streets, alleys and dead ends	Permanent occupation	Necessary/Optional/Social functions	All types of users	(+)
	Mosque	Permanent occupation	Necessary/Optional/Social functions	Generally men at different ages and children	(+)
	Market	Weekly occupation	Necessary function	Generally men at different ages and children	(0)
	Places	Daily occupation	Optional/Social functions	Men/children	(+)
	stores and commercial streets	Daily occupation	Necessary/Optional/Social functions	All types of users	(+)
	Residential space (houses)	Permanent occupation	Necessary/Optional/Social functions	All types of users	(+)
	Ecological park	Occasional occupation	Optional/Social functions	All types of users	(+)
	Party hall	Occasional occupation	Optional/Social functions	All types of users	(0)
	Gym	Occasional occupation	Optional/Social functions	Young men and children	(0)
	Cultural center	Occasional occupation	Optional/Social functions	Men at different ages and children	(0)
Architectural Scale	Rooms	At night	Optional function	All users	(0)
	Entry	Occasional occupation	Optional function	Men and women use it as a passage	(0)
	Patio	Daily occupation	Necessary/Optional/Social functions	Women generally	(+)
	Terrace	Permanent occupation	Necessary/Optional/Social functions	All users	(+)
	Kitchen	Daily occupation	Necessary function	Women only	(0)
	Garage	Occasional occupation	Optional function	All users	(0)
	Yard	Seasonal occupation	Optional function	All users	(-)