

The archetypes of landscape and sustainable design in the ksar of Kenadsa

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Abstract

The ksour are ancestral cities of the desert; they represent an inestimable source of reference with their ingenious durable architectures. They are charged with specifically local signs and paradigm that reflect a socio cultural and an ecosystemic context, and a singular landscape. Thus, the architect is confronted with these designs with which he can choose to refer to or not. Consequently, which resources do these ksour represent for the Saharan architectural culture? This article is a synthesis of a fieldwork carried out during the preparation of a thesis which questions the future of the ksour. It is the result of several surveys, investigations and interviews conducted during the period between 2012 and 2015 in the Kenadsa city. In this context a multitude of investigations approaching the anthropological aspect were committed. This approach is characterized by the research of the elements of the conceptual originality of the ksour and their future, in relation to cultural, ecosystemic and landscape dimensions.

To sieze the importance of these aspects, we propose to undertake a reading about the conception of the ksar of Kenadsa regarding these three dimensions. As a conclusion, we say that the ksour represent perfect archetypes for the conception of sustainable architecture that is specific to the Algerian Sahara. The lessons, which we can learn, refer to the inspiration of the local socio-cultural values, harmonious integration with the ecosystem, respect for landscape of the site, the use of local building materials and the urban architectural composition that is suitable to the microclimate.

Keywords

Ecosystem, Ksar, Landscape, Socio-cultural, Vernacular architecture.



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1. Introduction

In this paper, we consider ksar as a vernacular habitat, within the meaning of this micro space structured unconsciously and specifically by a given community. Ksar is a term of Arabic origin which indicated in the early days of Islam, a strengthened building generally located in an oasis. It was generally used as residence for a representative of authority. It was employed thereafter to indicate these strengthened villages, in the African northern Sahara. Into Berber, ksar is said *agham*.

The ksour are regarded as archetypal examples of cities. This is due to the morphological and organizational characteristics which they present (Champault, 1969). Built there for several centuries, they represent a significant source of reference for their architecture and history. They are charged with signs representing the marks of a singular socio cultural context. Located in arid areas with rigorous and harsh climate, they present the example of a perfect symbiosis between ecological architecture and natural landscape.

Our case of study will tackle the ksar of Kenadsa as an emblematic figure. This locality is a city in the state of Bechar which is located 955 km southwest of Algiers. The objective of this work is to try to detect the rules governing the process of its morphogenesis, in connection with its natural environment and its socio cultural context. It is about revealing the aspects of symbiosis between the architecture of the ksar and its palm grove all in unveiling cultural representations and landscapes which are specific to this oasis (Figure 1).



Figure 1. The ksar of Kenadsa in a state of disrepair.

2. The ksar, a vernacular projection of a cultural image

Culture has always been an essential dimension in the life of man who has manifested in the production of his living (Rappoport, 1972, p. 66). The ksar as a vernacular territory does not only express the environmental and landscape values, but it is also, the reflection of the local ethos (Moussaoui, 2002, p. 269). Explain the choice of site and morphology of human settlements only by ecosystem constraints and / or technology is in our opinion, insufficient. Given the spiritual (sacred) seems at least as important, if not the most crucial (Moussaoui, 2002, p. 7). Indeed, this architecture that is specific to a community characterized by its own representations is regarded as a reduced model of an Arab-Muslim city (Champault, 1969; Donnadieu et al., 1986; Marcais, 1954). This is due to the organizational characteristics which it presents from the formal and functional point of view. On the contrary, other experts consider that these ancestral cities existed well before the arrival of Islam; they were confronted with several socio cultural and environmental factors, which engendered their morphology and their specific organization (Figure 2).

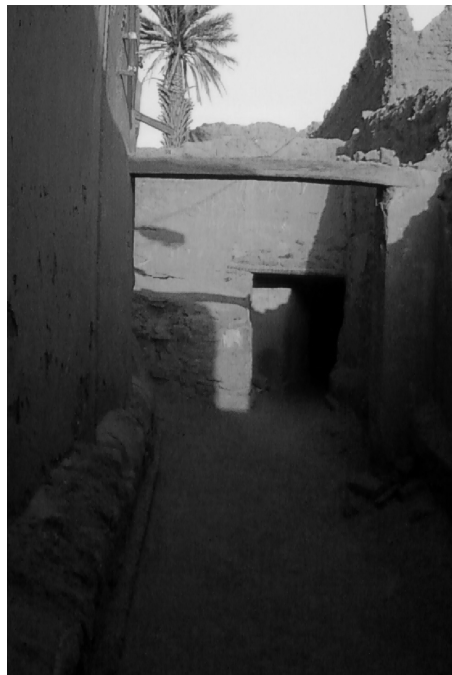


Figure 2. A Deriba (at bottom) in the ksar of Kenadsa.

On the other hand, Moussaoui advances critics to the theses which tried to define the origin of the ksour based only on a single view (Moussaoui, 2002). He demonstrates the existence of several factors that determine the morphology and the occupation of the ksour. He considers that the organization and the current form of ksour were strongly influenced by an Islamic religious morality. He advances four theses which were defended according to this methodological perspective. The functionalist thesis which considers the built, in all its components, as a functional answer to objectified data, is defended by two approaches.

The ecosystemic functionalism: the choice of the sites, the height of the building, the width of the streets, the employed materials, everything in this oasis society, in terms of our authors, falls within the same ingenious response to the constraints of the ecosystem. The bellicose atavism: this approach considers that Ksour, were fortified by walls, lookout towers and by other techniques, for reasons of war and defense (Echallier, 1968).

The second thesis is qualified as a culturalist Berber. This type of research has been carried out under the direction of Mouloud Mammeri, man-symbol of the Berber culture. Its objective was to demonstrate the antecedence of the Berber culture on the Arab-Muslim culture. In fact, this approach is founded in response to the identity crisis and the struggle for the emergence of the so called minority cultures, threatened to remain in the background. Thereby, they tried to bring out to the foreground the aspects of reference to the Berber culture. They tried to demonstrate the priority of Aghram on the other forms of ksar. However all Aghram go back approximately to the XV century. That is to say to the time of the arrival of the Arabs. The appellation Berber Aghram was regarded as sufficient to assign the production of this type of building to the Berber population (Moussaoui, 2002, p. 270).

The third thesis is qualified as progressive, it is supported by A. Adam, who considers the ksar is a kind of medina in failure because it would have missed the possibilities of material ac-

cumulation that would have enabled it to reach an appreciable size. He considers the ksar as an aborted city (Adam, 1978, p. 5-12).

In the Arab-Muslim woman, the religion has often been served as a landmark in the design of the dwelling and the urban landscape. As an example, we cite the choice of the orientation (even if this choice is irrational compared to other criteria), the requirement of a distinction between the sacred and profane spaces. The issue of intimacy and the degree of openness to the outside are also determinant, by consecrating the inviolability of the private life (very rigorous ranking of spaces, by distinguishing the passage of places from the most public to the private ones, chicane entrance, introverted house, *moucharabieh* windows...)

The concept of equality must also be respected at all scales. At the neighborhood level, it has led to sober uniform facades, allowing no distinction between the housing of the rich and one of the poor, despite the large difference of the interior. What strikes the observer, here is the general character unit. There are no two gestures; we build the dam, the mosque, the home. The builders have cut and cleaned every reason to influence or prestige and chose egalitarian solutions, no palace in the M'zab, they found themselves confronted with the only defense issues and the environment (Ravereau, 1989).

3. The concept of the landscape in the Arab Muslim culture

The landscape is considered as the cultural expression of the perception of the material world and its representation (Latiri, 2000). As the landscape can have diversified significances, since numerous cultural elements which are closely linked to a context, can intervene in the decryption of these different significations (Luginbuhl, 1989). The decoding of the landscape presumes a common language (Latiri, 2000). Thereby the study of the logic of the landscape construction requires the knowledge of the cultural specificities and conventions that are particular to the society concerned with the analysis.

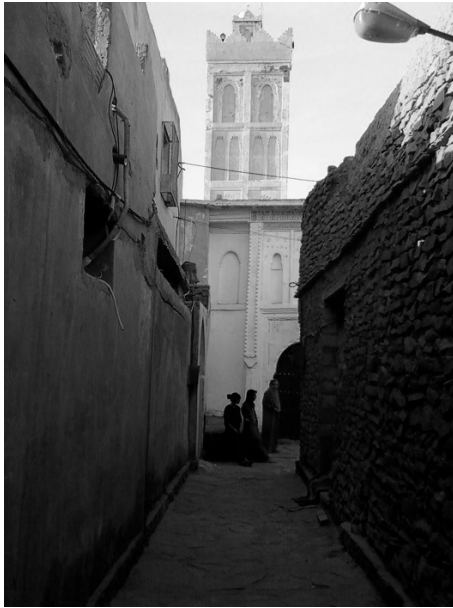


Figure 3. Derb Dlima, a perspective towards the mosque M'hamed Ben-Bouziane.

Consequently, we have sought the significances of this concept in the dominant culture of the region (Figure 3).

Thus, through the exploration of the linguistic and the literary Arab Muslim production sands out the existence of three criteria that permit appreciating the landscape. They are related to the visual, aesthetic and sensory aspects. Ibn Khaldoun adds the imaginary stereotypes that can influence the perception of the sensitive world. He wrote in the fourteenth century in his *Al Moquadima*, "The memory serves as a depot for all the perceived objects, whether imaginary or not. It is like a store which preserves them till the moment we need them" (Monteil, 1997, p. 90).

We find two words in the Arabic language which designate the term landscape: *Mandhar* and *Mashhad* that signify both the object and its representation. These words are extracted from the verbs (*nadhara*, *shahada*), and focus on the vision of an area without prejudice neither for its dimension nor for the mark which man prints. The concept evoked by these words expresses the portion of a space or a fragment of the material world, under the effect of a mentally guided glance and an esthetic. This aesthetic reveals that it is no more about any space but a particular one with its own characteristics that make it a landscape, since it is



Figure 4. Entrance to the mosque of Sidi M'hamed Ben-Bouziane.

about its setting in scene (Latiri, 1999). The fact that this notion is a carrier of beauty and ugliness, it allows to specify the characteristics of the place.

Quran gives the Muslim a model that guides its relationship with his environment, these are descriptions by the rushing water, landscapes and scenes that evoke are designed to capture the imagination of the faithful. The imagination of Muslim being conditioned by the notion of Paradise, the landscape it is because of pre-existing adjectives attributed to space and place. The Quran descriptions of Paradise are the most important moments in the history of Muslim sentiment landscape. This model combines all the riches of nature that inspired the Muslim man to meet his ideal of being sensitive.

The thought of the Moslem is conditioned by the existence of the paradise; the one of landscape becomes preexistent for him because of the qualifying adjectives attributed to this place. The description given by the Qur'an is understood in a symbolic sense. It is important to underline the relationship between the moral dimension of paradise with the oasis manifested by the sacredness of the palm tree, the aura of the oasis, and water, the basic element for life. These three concepts are controlled by a code of morals and well defined social practices (Miquel, 1980). The mental symbolization of the paradise which is rooted in the social

collective memory is projected in the oasis (Latiri, 2000). The concepts of paradise, gardens, and landscapes become hence synonyms that eventually become interchangeable.

The example of the palm plantation (el-Jenna) in the construction and the conceptualization of the landscape oasis is particularly edifying. The palm tree as a sacred tree of Islam and symbol of eternity is regarded as a crucial factor of the structure of the oasis landscape. In addition to the fact that the palm plantation is a work place, it is also a living being linked emotionally to the family. Thus, in several cases, each member of the family member owns a palm tree that holds his name, therefore, we say it is the palm of Kada or Fatima..., that way, this person gives all his affection to this tree. Oral tradition reports to us that in several cases, when the person cedes his palm tree he crumbles and dies at once.

For the inhabitants of the ksar, the palm tree is also blessed because it would have been created by God with a piece of the clay that was used to create Adam. It is indeed, because it would have nourished Mary when she was driven out by her tribe. The crowned value of the palm tree is reinforced by the fact that it is quoted 22 times in Qur'an, we find it in *surates*: S. VI, 99, 141, S. XVIII, 42, S. XX, 71, S. XXVI. It is also mentioned, in much *hadith*, (about the prophet Mahomet), we quote, "I swear by Him, Who holds my soul in His Hand, there exist palm trees in paradise".

4. The logic of morphogenesis ksar Kenadsa

Reading the process of formation-transformation, the ksar of Kenadsa allows us to address a number of rules governing its genesis and evolution. Its genesis obeys an order enacted by a religious morality. In this context, it has been demonstrated by several scholars that the Qur'an and the prophetic tradition give to the Muslim rules governing his relationship with his natural environment like the respect for nature, sharing of resources... It also defines the limits of his intervention and his relations with the built environment, the public spaces,

the neighborhoods and the templates of constructions. (Blanc, 2007; Gardet, 1970). In our case, the continuous and progressive growth of entities has only been possible by the strict respect of certain rules and operational tools derived directly from the teaching of Sheikh (Rinn, 1884). The city is made up of successive centralities, which is a characteristic of each level (ksar, entity, house). At the ksar level, the organizing core is the mosque which also constitutes the geometric and social center (Figure 4).

The ksar was organized from the old mosque (*el-djamaa*) and the *Kasbah*. In extending towards the north and east, the Kasbah was surrounded by a wall stone (*essour*), equipped with watchtowers (*bordj*) and pierced by three urban gates. It is with the arrival of sheikh sidi M'hamed Benbouziane in the 18th century and the establishment of Zawiya Zianiya that Kenadsa prospered (Hirtz, 1989). It became spiritual, cultural and commercial at the same time (Figure 5).

The *zawiya ziania* is founded in 1686 by Sheikh Sidi Mohamed Benbouziane. The term *zawiya* appointed in the first instance, a dedicated room within a larger structure where the *Sufis* (Muslim mystics) could withdraw, as suggested by the direction of the Arabic root word (angle or corner). This term also comes from the Arabic word which means *inzawa* "opt out" is an angle from which life is perceived differently, which gives the place its semantic load retreat. Thereafter, the term shall mean a religious complex containing a mosque, rooms reserved for study and meditation to another (*Eddikr wa Etta-fakour*) and, a hostel to accommodate visitors. It performs spiritual practices and there buries the founders of soufi saints (Rinn, 1884).

Spatial order of the growth was structured primarily by *foggaras* of a north south direction that would become *zkak* (a small alley). The *foggara* is an irrigation system Saharan form of underground tunnel. Subsequently, a system of *droub* (covered alleys), classified, punctuated by a subtle play of shadow and light, structures the ksar (Figure 6).

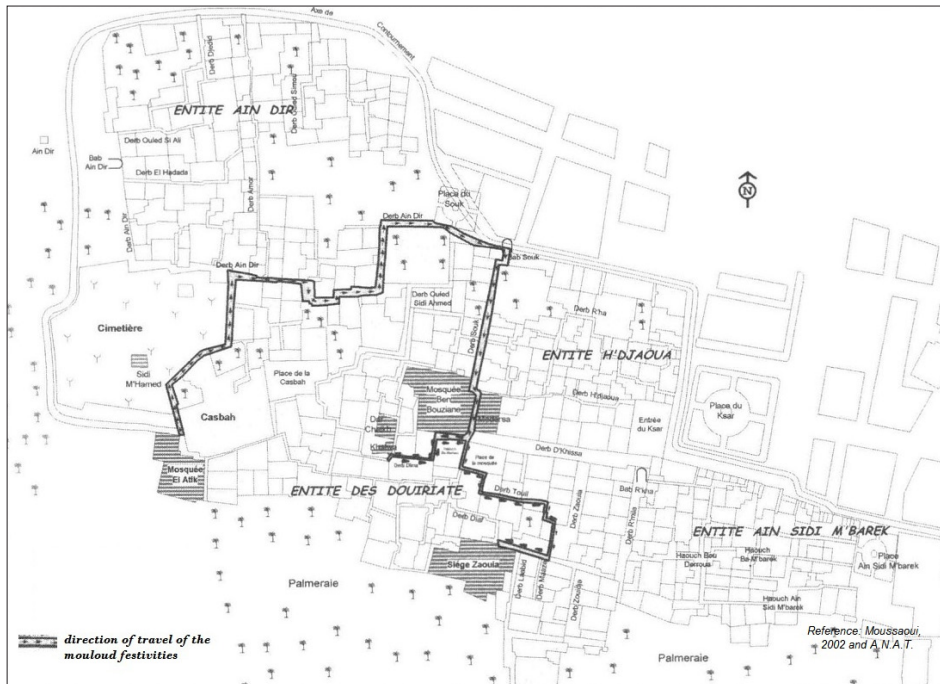


Figure 5. Direction of travel of the religious festivities (mawlid ennaboui).

5. The ecosystemic integration ksour

According to Ravéreau (1989), these desert cities offer the most complete example of an adaptation to environmental constraints, architecture and an urban friendly environment. The ksar thus, presents an archetype adaptation to the natural ecosystem; this is manifested by the orientation studied in relation to the sun and prevailing winds, the use of natural elements, the densification of urban areas, the bioclimatic conception of the spaces and the rational use of architectural elements and the constructive methods. The palm tree is a natural filter between the ksar and the desert; it offers a favorable microclimate to the sedentarisation of man.

Thanks to greenery, shade, water and silence, it is a pleasant place to live in that provides relaxation and freshness. The palm tree is always associated with the ksar. Thereby, all these constituents are exploited by man of the Sahara. It is also a real sun breaks, in such a way, an Arab proverb says “the palm tree grows, the head in fire and feet in water”. Indeed, all these components are operated by humans Sahara. For example: *El-kheshba* (palm trunk), it is used as a beam, ladder wells, columns, mortars, troughs, loom, gargoyles, gutters irrigation ... *El-Jerid* (fins): stripped leaves are used for ceilings crisscrossed,

hedges (*zeriba*), pergolas, failures, loom, beds, windbreaks (*afreg*) ... *El-lif* (wood fluff forming around the trunk) is used to ropes, bags, nets ... *El-kernâf* (petioles fins): it serves as a urinal masons to compact the earth and women to beat the wool after washing, making fighting camels and recycled as firewood. *Ez- zaaf* (leaflets) used by women for weaving baskets ... etc. (Layachi and Chekkal, 2011).

Water is a scarce commodity and essential to the life of the ecosystem (palm, ksar, inhabitants); thus its distribution has been fair. It is a complex and ingenious system which takes into account the times of the day (night and day) and seasons through non covered canals (*segua*). These latter contribute to the refreshing of the ambient air. We also note the existence of a perfect balance between the water sources, the palm, the population and the size of the ksar. When an imbalance occurs, another ksar is created in another site.

Designers of the ksar have grasped the importance of the amortization of undesirable winds by creating breaks in the delivery of their cash. Thus, they have opted for narrow paths, twisting, non regular and oriented according to the sun and the prevailing wind. In most of the cases, the streets are fully covered; some voids are reserved to its lighting and ventilation. Thus, enjoying



Figure 6. A subtle shade of light on landscape structure Ksar Thurs.

the play of shadow and light that it created, we can better control the periods of the sunshine of facades, generate fresh air flow and prevent the wind to chase the fresh air that was accumulated during the night. Regarding housing, the most widespread type is the patio house or *wast- eddar*. The patio meets the needs of introversion and acts as a thermal regulator. It is a shady place most of the day, and the gallery that borders it (*riwak*) reduces the sunshine of the adjacent rooms. The rooms (*buyut*) and the other spaces are articulated around it (Figure 7).

6. The ksar, a symbiosis between the natural and architectural landscape

Kenadsa is a small town of some 13000 inhabitants. It is distant about twenty kilometers from Bechar (the regional capital of the Saoura). It is implanted in the foothills of the Saharan Atlas in the region of the Saoura which constitute a part of the north western Sahara. This region is known for its extremely arid characteristics. This town is located at 4° 6' west longitude and 31° 6' north latitude. Its average latitude is 780 meters. It presents a peak of terrain of not more than ten meters. This region is characterized by very flat reg sandstone interspersed into sandbanks. Kenadsa owes its existence to the countless canals that feed its arid plateau. It is the river which creates life. The landscape is shaped by the natural



Figure 7. Home ain eddar, Carrier system arcade.

components of the site, the ocher color of Barga and sand dunes, the green palms and the blue reflection of the sky on the water.

6.1. The natural site of Kenadsa, a marvel landscape

The integration of the ksar to its surrounding nature is so harmonious that it leads us to wonder if it is about a natural or architectural landscape. This is manifested by the state of symbiosis that the palm/ksar couple presents. In fact, when admiring this landscape we feel that the ksar is native of land and the palm. K. Lynch proposes to identify in the city, the elements that combine each other to form an overall picture, and wonders about the quality of legibility, identity and memorization of this representation by the inhabitants (Pannerai et al., 2009). In this methodological logic, we will try to unveil the secrets of this ecosystemic and landscape symbiosis between ksar and oasis. We will develop the key elements of the urban landscape (course, nodes, areas, limits and benchmarks) and some aspects concerning the identification and the singularity of the landscape in relation to different levels of appropriation of space. In the following passage, we present the aspects of the harmonious integration between nature and the urban landscape produced by the local man.

6.2. The integration of the ksar with its natural territory

At the level of the palm grove and the territory, the ksar of Kenadsa comes in a compact form, of an earth color (ocher-gray), adjacent to the palm grove. Its outward appearance resembles the other ksour of the region. It is a set of grouped habitat that is overlooking a land situated in a valley. Built on a slight slope along the north south axis, it respects the necessary declivity for the circulation of water between the protective cliff (la barga) and the nourishing palm grove. From afar, the ksar in ocher gray color, is hardly distinguished from the sands that cover the flanks of the cliff (rock hill) at the foot of which it stands. At the base of this ochre gray stain, spreads a dark green color (palm grove), dense, then sparse as long as we move from the ksar. Between these two limits, stretches a compact aggregate of cubes (the ksar) matching the colors and the shapes of the landscape. (Moussaoui, 2002, p. 69). The existence of the oasis depends on the availability of water resources that ensure the creation of extensive gardens, functioning as pleasant microclimates for life and relaxation. So the couple ksar/palm appears as a balanced ecosystem, providing excellent landscape picture to contemplate (Figure 8).

This integration reflects the respect for local natural ecosystem with the adoption of a traditional irrigation system, the balanced exploitation of the assets of the oasis, the balanced morphological composition, and the construction with materials issued from nature (stone, clay, straw, trunks, and palms). In fact, two only unique times, the inhabitants defied the environment in its plasticity. The first time, when raising a graceful minaret of a square basis with blind niches which report volumetric proportions. Two levels of niches and the head of the minaret constitute proportions that are harmonious and bold enough to challenge the height of the cliff. Momentum towards God is an excess of things from our world. The second time, they are the temporal reasons that will dictate the way and the color of the house of sheikh, a sumptuous house which



Figure 8. The ksar with earth color harmoniously integrated with its palm.



Figure 9. The zaouïa of Kenadsa after restoration.



Figure 10. The ksar place (rahba) after refurbishment.



Figure 11. The space of the djemaa in the ksar of Kenadsa.

white color and the engendered arcades indicate the distinction of its tenant. Impressive by its size and architectural character, it overwrites the

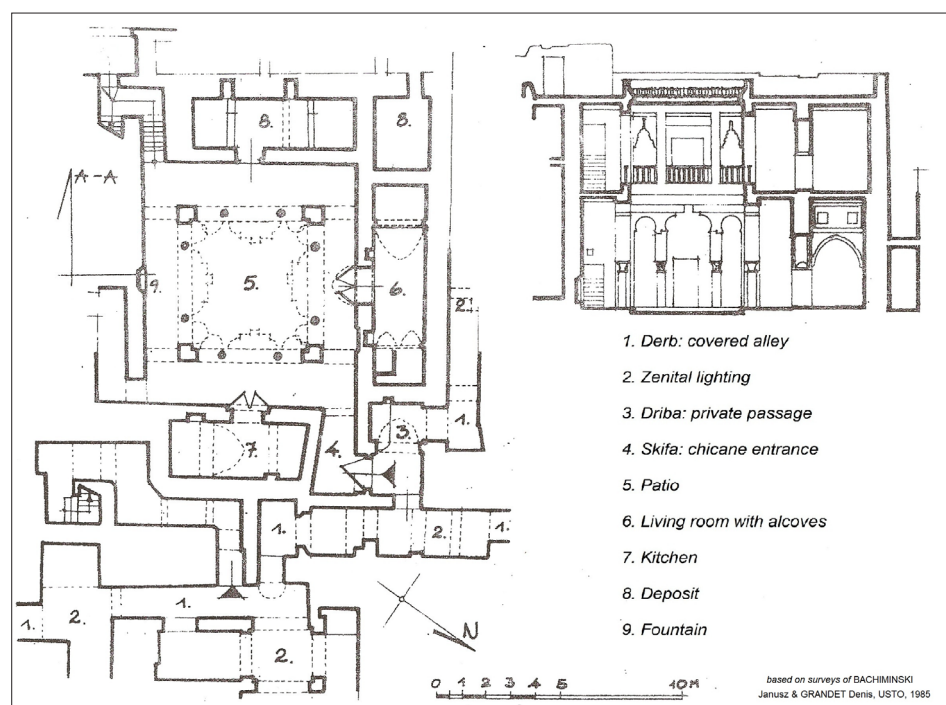


Figure 12. Plan and section of a patio type house in the Ksar Kenadsa.

habitations of men without ever challenging the house of God (Moussaoui, 2002, p. 69) (Figure 9).

6.3. The ksar in the city

At level of the city, the ksar constitutes the culmination of the main axis (boulevard), which presents an excellent perspective. It is noted that the relationship between the city and the ksar is issued from three main sites (*rahba*). The first one is of a strong attractiveness, called *rahba du ksar*. The two other ones situated at the suburbs are: *Ain Sidi Mbarek* place and the one of *Souk*. These three places constitute the nodes of convergence of the main courses, they are therefore the major landmarks. The ksar is identified by a main road which presents today a mechanical character. This path carefully goes along all the houses which formerly constituted the wall of the city. The natural earth color of the ksar is contrasting with the new hard built environment (the reinforced concrete, the cinderblock....) (Figure 10).

6.4. The ksar and urban entities

Urban entities are the combination of several houses organized along a street or around a plot (*rahba*) defining an urban independent unit that is appropriated by the group. The transition from one entity to another occurs

without physical barrier; however, the boundaries are often psychological. Entities differ from each other according to a lineage distribution and by social groups based on ethnic, religious kinship or according to the dominant activity. Thus, we find the entities of notable people (descendants of sheikh sidi M'hammed Benbouziane), the grouping of the *douiriettes* (large homes reserved for guests, the artisans city (*hadjoua*), the territory of peasants (*aïn eddir*), and the entity of the Jews (*aïn Sidi M'barek*). Assembly houses (*diour*) among each other reflect a system of social solidarity, where the logic of any concessions marks the implantations (Figure 11).

All entities (neighborhoods) in structured and hierarchical assemblies are differentiated sectors. Four major route structure and organize the space within the city. This network is punctuated by urban events (squares, monuments, buildings, marking ...). It is prioritized in the following order: *zkak* and *derb*, large arteries (lanes) public and semi-public, serving different parts of the ksar, the *driba* (small semi-private crossings), often covered, and allowing an access to the houses. A virtual frame ordered morphological division of plots. A growth area is made in a geometrical ratio relatively constant duplication. Obeying a mod-



Figure 13. The patio, aesthetic element, thermal regulation and openness to the celestial landscape.

ulation of 160 m, this mesh supports *derb* as axes officers punctuated events and sequences. The urban landscape is marked by a subtle play of light and shade which directs the course and *derb*. These skylights are arranged rhythmically along the streets.

6.5. At the scale of the house

Negotiating the transition between the outside and the inside is always done through a hierarchy, where each boundary is marked by a threshold (*skifa*). It is a chicane entrance which has a role of a filter with a set of doors or indirect passages. It is the median place of the house between two worlds the outside (male) and the inner (female). (Figure 12).

The patio is usually square in shape; it is often marked by the presence of four poles with arcades (*syriat*), which serve to cover galleries (*riwak*) around it. It is the irreducible core training deformations which are resumed by peripheral areas. Being the heart of the house, it constitutes the common space for the living space, for the work of women, games for children...etc. Through this space the house offers the inhabitants a part of the celestial landscape and calls for its contemplation by the visual communication with him. (Figure 13).



Figure 14. House *ksar*, an architectural heritage abandoned.

7. Mutations of the Oasian landscape

7.1. Ruptures in the evolution of Ksour

Major ruptures that affected the oasis are almost identical. They started during the colonization by the disaffection of the aristocratic hierarchy. Later, they took other forms after the independence, imposing agricultural systems which were not appropriated by the local populations. In fact, “the majority of the serfs (the *harratin*) are free from servile labor in the context of the ruin of owners subject to the colonial tax exaction. The second rupture, consecutive to the previous one, holds the dynamic nature of *haratin* oasis at the aftermath of independence. However, the supposed social mobility result is neither obvious nor systematic; it meets resistance from above and the conservatism of the old land notability. “The oasis experience; however from the 1980’s transformations that change the social order, “coexistence of an oasis culture and a capitalist culture leading to the abundance of the former one, and the gradual professionalization of farmers becoming agricultural laborers. This situation resonates curiously with the process of colonization of Algeria in the mid nineteenth century.

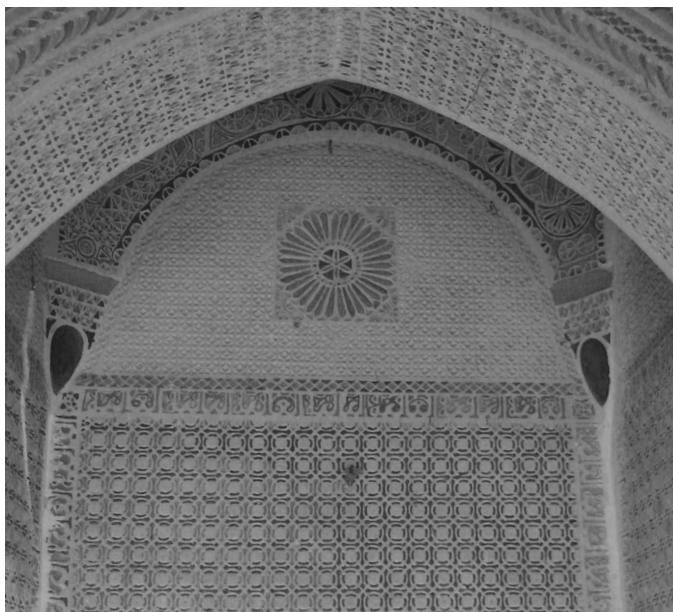


Figure 15. *The wealth of decorative motifs in the ksar.*



Figure 16. *Mutations and disfigurement ksourien landscape.*

Socioeconomic difficulties which the oasians meet nowadays pose the problem of relationship of the local society with its agriculture and environment. In fact, the modernization policies of agriculture however have created an upheaval of the social structures and ancestral practices.. Actually, as it is the case in all cities of southern Algeria «vertical social structures (economic hierarchies) and horizontal (traditional solidarities), logic of economic interest and local power, urban reality tends to dilute lineage reports and reconstruct the social landscape (Belguidoum and COTE, 2005, p. 202). These mutations which the ecological and socio economic cost is significant, have disfigured the landscape catastrophically (Figure 14).

7.2 Kenadsa, a degraded ecosystem and landscape

Since its foundation from 1686 until the early 20th century, the ksar of Kenadsa was one of the most prestigious cities in the south of Algeria. Being distinguished by its cultural and religious dimension, its architectural value, and the extent of its urban influence, it played a radiant central role throughout the western part of North Africa. (Figure 15).

“The specialty of the marabouts of zawiya ziyania was to drive caravans and to protect them against the highway robbers. Kenadsa became little by little, thanks to this beneficial action, of great importance”. (Ceard, 1933, p. 37-140). The ksar of Kenadsa is now a marginalized suburb of the city which has developed by making its original core a commonplace and by abandoning a rich heritage which holds the history and the identity of a whole community. Indeed, the urbanization projects which are still scheduled outside of this ancient city, strongly contribute to its degradation. However, if the ksar lost its residential function, the spiritual role of zawiya ziania would not be affected by the decrepitude of the places. Currently, the ksar of kenadsa is largely abandoned and the inhabitants, who remain there, have undertaken some changes which have sometimes affected the morphology and altered the urban landscape (Figure 16).

8. Conclusion: The ecosystem and landscape reintegration of the Ksour

Culture, ecosystem, architecture and landscape are deeply connected and maintain relationships of interdependence. Indeed, the landscape for vernacular architecture is only the cultural expression and representation of the world perception. Throughout this work, we tried to confirm the hypothesis that ksour represent perfect symbiosis of an ecosystemic and landscape archetypes. Hence, we consider that these vernacular cities are perfectly successful from a landscape and an architectural point of view. This finding is raised from the fact that this architecture integrates perfectly with the natural environment, and respects faithfully the cultural identity of the inhabitants.

The use of natural materials in construction, as well as the morphological composition that respects the site, is in our opinion, the main cause of this balance. Similarly, the oasis landscape reflects the image of cultural legacies and local social representations. We have shown, in this context, the report of the (*el-jenna*) palm with Islamic beliefs, in which the heavenly model is the most recurrent expression.

This work has allowed us to reveal the existence of a landscaped model specific for oasis that illustrates a harmony between man, the ksar and its palm. Currently, we raise transformations that disfigure the landscape and reflect the disruption seen by the oasis society. This latter was affected by socio-cultural and economic changes that led to the desertification of the palm and the abandonment of the ksour. Similarly, the architectural production that is specific to the Saharan context seems gradually to disappear in favor of bringing new approaches. Thus, the construction with inadequate materials and the inappropriate morphology contrast with the natural and cultural landscape, altering deeply.

In the ksar of Kenadsa, the sacred buildings are intensively frequented nowadays. These buildings and pathways that they mark out must therefore constitute a starting point for any

project of enhancing the landscape. The other major advantage to exploit is the one of the ecological tourism. So many landscape sites can be exploited to promote this field. The palm, water and traditional irrigation system which constitute the constructor thread of the oasian nature, must participate in the rebuilding of the local landscape model (Figure 17).

The oasian patrimony should be re-considered as a marker of identity; and its rehabilitation should be approached from different perspectives: socio-cultural, economic, ecosystemic, architectural and landscaped. To achieve this end, the mobilization of all the actors involved in this field is mandatory: residents, the elected, the concerned authorities and the professionals. These oases must be involved in the dynamics of contemporary urban Algerian Sahara. However, this ambitious policy tends to impose operating procedures that are foreign to local social practices and that are questioned by the local population. This latter yearn for commitment to innovative actions without causing mutations that can affect the essence and the form of these ancestral permanence. A commitment of scientists is equally fundamental to identify the teachings of these archetypes from the ecosystem and landscape conception.



Figure 17. Renovation of the ksar kasbah with stone.

References

- Adam, A. (1978). L'agadir berbère : une ville manquée, *ROMM*, 26, 5-12.
- Belguidoum, Saïd, & CÔTE, Marc (2005). *La ville et le désert, le Bas-Sahara algérien approche socio-économique : une urbanisation pour quelle urbanité ?* Edition IREMAM-KARTHALA, Aix-en-Provence.
- Blanc, F. P. (2007). *Le Droit musulman*, Edition Dalloz, Paris.
- Ceard, L. (1933). *Gents et choses de Colomb-Béchar (sud Oranais)*, Edition archives de l'institut pasteur, Alger.
- Champault, D. (1969). *Une oasis du Sahara Nord-Occidental : Tabelbala*, Edition CNRS, Paris.
- Conan, M. (1994). *L'invention des identités perdues, Cinq propositions pour une théorie du paysage*, Edition champ Vallon.
- Donnadieu, C., Donnadieu, P., Didillon, & J.M., Didillon, H. (1986). *Habiter le désert : Les maisons mozabites*, Edition Archi + Recherche, Bruxelles.
- Echallier, J.-C. (1968). *Essai sur l'habitat sédentaire traditionnel au Sahara algérien*, Edition IUP, Paris.
- Gardet, L. (1970). *Islam, religion et communauté*, Edition Desclée de Brouwer
- Hadj Mohamed, N., Madani, M. (2015). Renouveau des espaces habités spécifiques aux régions sahariennes, l'exemple de Béchar. *Revue des mondes musulmans et de la Méditerranée REMMM*, 138.
- Hirtz, G. (1989). *L'Algérie nomade et ksourienne, 1830-1945*, Edition P. Taccussel, Marseille.
- Latiri, L. (1999). *La mise en paysage des systèmes d'irrigation dans les oasis du sud tunisien*, Thèse de doctorat, Université de Paris I-Panthéon-Sorbonne, Paris.
- Latiri, L. (2000). La société oasienne du Djérid et les représentations paysagères, *Cybergeo : European Journal of Geography*, 133, 65-69. doi:10.4000/cybergeo.4405.
- Layachi, A., Chekkal, A. (2011). *Le devenir des ksour de la Saoura*, Projet CNEPRU, USTO M-B University of sciences and technologies Mohamed Boudiaf, Oran.
- Luginbühl, Y. (1989). *Paysages : textes et représentations du paysage du siècle des lumières à nos jours*, Edition La Manufacture, Barcelone.
- Mahrour, K. (1994). Tamentite : cité du désert ou le patrimoine comme référence dans l'enseignement de l'architecture, *Habitat : tradition et modernité*, 2, 23-36, Alger.
- Marçais, G. (1954). *L'architecture musulmane d'occident : Tunisie, Algérie, Maroc, Espagne, et Sicile*, Edition Arts et Métiers graphiques, Paris.
- Marouf, N. (1980). *Lecture de l'espace oasien*, Edition Sindbad, Paris.
- Miquel, A. (1980). *La géographie humaine du monde musulman jusqu'au milieu du XIe siècle : Le milieu Naturel*, Edition EHESS, Paris.
- Monteil, V. (1997). *Extraits du Discours sur l'Histoire universelle : Al-Muqaddima*, Edition Sindbad, Paris.
- Moussaoui, A. (2002). *Espace et sacré au Sahara : Ksour et oasis du sud-ouest algérien*, CNRS Éditions, Paris.
- Panerai, P., Depaule, J.-C., & Demorgon, M. (2009). *Analyse urbaine*, Edition Parenthèses, Marseille.
- Rapoport, A. (1972) *Pour une anthropologie de la maison*, Edition Dunod, Paris.
- Ravereau, A. (1989). *Le M'Zab, une leçon d'architecture*, Edition Sindbad, Paris.
- Rinn, L. (1884). *Marabouts et Khouans. Étude sur l'islam en Algérie*, Edition Adolf Jourdan, Alger.