

# CONSERVATION OF EARTHEN ARCHITECTURE: GOVERNMENTAL ACTIONS AND OWNERS' PRACTICES TO PRESERVE KSAR TAGHIT, ALGERIA

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## 1. Introduction

Southern Algeria offers a wide variety of vernacular earthen architecture: simple houses, granaries, palaces, religious buildings, urban centers, cultural landscapes and archaeological sites and ksour... all of which play, each in its own way, a major role in the expression and revelation of local identities and exemplify their diversity. The quality and durability of the building techniques, moreover, particularly affirm the ability of the inhabitants of this region to develop strategies of adaptation to their environment.

As everywhere in the world, the vernacular habitat in this area appears increasingly threatened. The causes are both natural and human: climate change, flooding, natural aging, demographic pressure, expansion of the internal urban fabric, lack of maintenance, abusive remodeling by introducing incompatible materials, etc. These are the causes that have pushed the inhabitants to leave their habitats for the new urban centers. Some, however, have remained, but have transformed their houses with the sole purpose of satisfying the exigencies of current life.

This situation has created a source of considerable concern for the actors in charge of heritage protection: first its degradation, then the disappearance of the built heritage with its original know-how, use of local resources, its adaptation to the climate and its undeniable charm. To address this situation in Algeria, several operations of conservation and enhancement of the ksour (fortified oasis villages) have been realized by the local authority. The inhabitants, for their part, have opted to preserve and manage their own property, according to their personal capacities. In this article, we will study the programs carried out by the government for the preservation of the ksar Taghit. How have the owners proceeded to conserve their properties and how have they benefited from them? Beyond the material aspect of this common good, are the efforts undertaken sufficient to make this common heritage operational and dynamic?

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## 2. Methodology

To answer the questions raised, we first apprehended the subject by collecting archives relating to conservation and rehabilitation operations (studies, photos, manuals, reports, plans, etc.) from the organizations concerned: the Directorate of Culture of Bechar, the Directorate of Tourism and Crafts, the Chamber of Crafts and Trades, the Directorate of Urban Planning and Construction and the archives of the inhabitants. Then we supported our collection of information by observation, taking photographs, and interviewing the various actors, including residents, associations, architects, masons and artisans, which allowed us to complete our documentation and to make an inventory, in order to compare the content of the reports and studies that had been gathered, with the material/physical reality in the field.

## 3. Presentation of the ksar Taghit

### 3.1. Integration and planning logic

Taghit is an oasis in the Saoura, a valley in southwestern Algeria that stretches from Bechar to the limits of Touat and Gourara. It is located in the middle of the desert along the ancient caravan routes linking the Maghreb to sub-Saharan Africa. Anchored between the high dunes of the great western erg<sup>1</sup>, the trickling water of Oued<sup>2</sup> Zousfana and the rocky nature of Mont Baroun, its panorama has evolved, presenting a series of ksour, which reflect the genius and know-how of the ksourians<sup>3</sup>. These human settlements have imposed themselves in this expanse of desert by defying the difficult climatic conditions determined by the aridity, the high temperatures, the irregular precipitations, and the low density of its vegetation.

The oasis of Taghit is composed of several ksour distributed over five small settlements: Taghit, Zaouiya El Fougania, Berrebi, Bakhti and Zaouia El Tahtania, with a palm grove of more than 120,000 date palms extending over 20 km along the bank of the Oued Zousfana [1].

The eponymous ksar (ksar Taghit) which is built in the neighborhood of the palm grove, is practically the only witness of the millennial history of this oasis and was built in the 14th century [2] in red earth, on a rocky plateau (Figure 1).

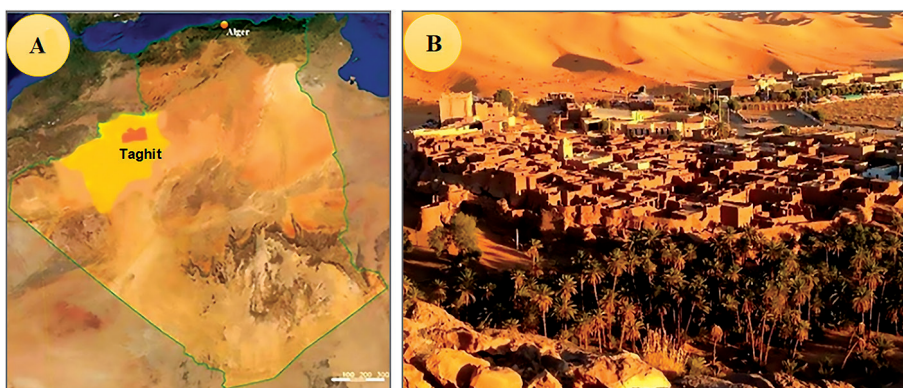


Figure 1. A) Location of the ksar Taghit; B) view of site.

This ingenious center of life was cleverly built using mudbricks (toub)<sup>4</sup> made by local builders known as maallem, without the aid of architects or engineers. They were builders who knew how to integrate the dwelling into the dune landscape by using a form which blended in perfectly with the reliefs and an ochre color derived from the local materials. It is a compact urban center with a horizontal layout and fortified by a rampart in brick and stone that was well-adapted to the rocky site. It is composed of about 120 houses [3].

The walls of the internal houses on the edge of the ksar are high and have few openings to ensure the protection of the city by forming a kind of double rampart which is pierced only by two main entrances: a southern entrance opens onto the public square known as rahba. A second one to the east, which is more discreet, is reached by means of some steps.

The ksar has a 'radio-concentric' layout (i.e. a centre with concentrically and radially oriented streets), which is more or less regular, compared to medieval cities. It is organized around a central mosque (jama'a) from which diverges a maze of alleys branching from the main street (darb) that become narrower (zgag) to provide shade and shelter from the weather; these, in turn, lead to dead ends (dribat) where the houses are located. The ksar has a public square, where its inhabitants used to gather and hold festivals; it is called tadjmiit, and serves two other smaller squares: one at the southern entrance of the ksar, called the mouth of the ksar (foum leksar), which contains a fountain; and the second, called lemjizra, which was used for sheep sacrifices. There is also another meeting point - the well - which is reached by descending some stone steps; the ksourians had first dug it outside the rampart, but later surrounded it with a wall which joined the rock on which the ksar is built, so that it became an integral part of it and was protected during invasions (Figure 2).

For its representative values of an authentic culture and the exceptional interaction with its environment, ksar Taghit has been classified as a national architectural heritage site since 1999<sup>5</sup>.



Figure 2. Ksar Taghit, architectural and urban know-how: A) alley - zgag; B) public square - rahba; C) external wall of a house forming a double rampart; D) main entrance; E) collective well; F) mosque - jama'a.

### 3.2. Conservation state of the ksar

This human settlement, which has resisted the natural hazards of the area, has been threatened for decades. The factors of degradation are multiple: the natural ageing of the constructions and structures, the fungal diseases and the mycoses (bou-fraoua, bayoud) which affect the palm trees used in the structure, the wind erosion and the climatic change responsible for the disappearance of the vegetal cover that has generated desertification. However, the erosive actions of water remain the major enemy of this earthen architecture. The infiltration of rainwater, frost, violent and unexpected floods, the capillary rise generated by soil moisture, are the many causes of the lesions and deficits found on the buildings, the degradation of the structure, the cracks in the walls, the detachment and blistering of coatings. In addition to the fact that earthen architectures are considered as constructions for the poor, these degradation factors project an image of fragility, danger and unsustainability [4] that weakens confidence in the material (Figure 3).

Community efforts and the exploitation of human genius have always found relevant solutions to deal with natural risks. However, it is undoubtedly the anthropic factors that have most affected this ancestral heritage: the often destitute populations, attracted by the advantages of contemporaneity, abandon their habitat when they do not operate abusive remodeling, a situation that has resulted in a lack of maintenance in sanitation systems, problems in the provision of drinking water, the use of standardized and non-compatible materials, the stealing of materials, and the demolition of the traditional house to rebuild in concrete. Faced with the lack of qualified masons and the disappearance of traditional building skills, the preservation of this heritage remains a challenge.

### 3.3. State of the ksourian society

Some researchers, such as Bendjelid, refer the disappearance of traditional practices and the lack of qualified masons to the transformation of the social structure of the oasis towns. After the application of the agrarian reform by H. Boumediene<sup>6</sup>, based essentially on the elimination of all forms of exploitation of the people, ownership of the land was returned to those who worked it. For this purpose, the harratine<sup>7</sup>, bearers of the know-how, which ensured in the past the maintenance and the continuity of the oasis system, were released and no longer worked for the chorfas and mrabtime<sup>8</sup>, owners of the land [5].

On the one hand, this policy allowed the harratines to appropriate agricultural land, but it destroyed the social links, the hierarchy and the composition of the oasis community, so they don't work anymore for the chorfas and the mrabtimes. In the same way, the new administrative division and the creation of a new administration has motivated individuals to open up to other horizons in search of a stable income, thus subtracting from the primary sector in favor of the secondary and tertiary sectors and undermining the vocation of each individual in the oasis community.

On the other hand, the migratory movement towards the big cities in the north and the appearance of the agricultural socialist village [6] have influenced the behavior, vision and lifestyle of the Saharan community, notably in the form of their construction and their definition of "comfort", thus harming the authenticity of the oasis' built environment. As for the ksour, they are only the witnesses of an identity in the process of disappearing.

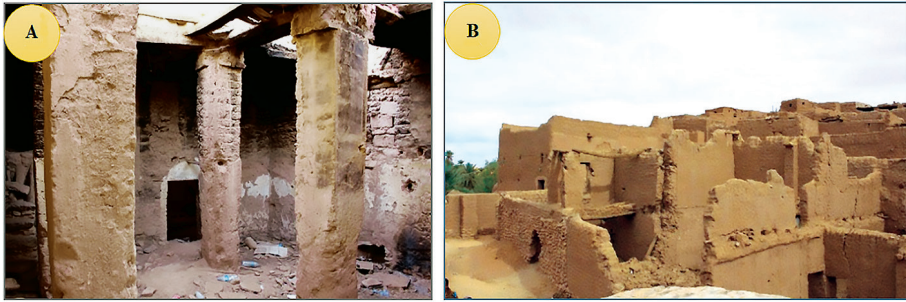


Figure 3. Ksar at Taghit, state of conservation: A) an abandoned house; B) a ruined entity.

#### 4. Conservation and enhancement of ksar Taghit

##### 4.1. Action undertaken by the government

Ksar Taghit has been the subject of several preservation programs under the supervision of different organizations (the National Agency for Territorial management, the Directorate of Culture under the Ministry of Culture, the Ministry of the Interior and Local Government).

- During the period 1997-1998 a study of the development of the ksar was carried out following the opening of the procedure of classification of the ksour Taghit and Kenadsa. The study was programmed in two phases: the first under the direction of the National Agency of Territorial Management [7]; the second one was elaborated by the Directorate of Culture of Bechar [8]. The aims of this study were: to highlight the interest of each element forming and structuring the ksour proposed for classification, to highlight their functions, their organization, and their mode of operation; then, to establish an in-depth inventory and to organize surveys among the inhabitants to identify their concerns; finally, to identify the priority interventions to be undertaken to ensure the development of the ksour and the integration of their inhabitants [9]. As a result, three ksour, Taghit, Kenadsa and Beni-Abbes, were classified as national heritage sites in 1999 [10].
- In 2001-2003, the program “grand sud” was launched, under the direction of the FSDRS program (Special Fund for the Development of the Southern Regions) in partnership with the DUC of Bechar (Directorate of Urban Planning and Construction) [11]. This program aims to promote cultural, tourist, artistic and craft activities, and proposes operations to protect and enhance the natural environment, and archaeological and architectural heritage. It was carried out by Maiza architecture studio according to administrative procedures (public tender, submission, choice of the lowest tender offered) according to well-defined specifications, established by the local authorities. This project supports operations to protect and enhance the natural environment, flora, fauna, archaeological, historical and architectural heritage; operations to revitalize oasis spaces and the traditional irrigation systems. As a result, several young people have been trained in the craft and traditional construction of these elements and then registered in the list of artisans of the Chamber of Crafts with the issue of crafts-

manship. The project also includes the rehabilitation of several other parts of the ksar (mosque, wells, ramparts, groups of houses, streets and alleys); the conversion of some houses into guest houses to accommodate tourists; increasing people's sensitization and exchange of information by means of an itinerant exhibition. The programming of several workshops for discussion and training at the national and international scale (Figure 4).

- 2004 and 2007, the program "la route des ksour " was set up by the Ministry of the Interior and Local Communities in partnership with the PNUD (United Nations Development Program) [13]. It takes up the ancient routes of the Saharan trade caravans and proposes the promotion of cultural tourism in the southern region of Algeria as a complementary economic activity for the region. Similarly, it aims to fight effectively against the situation of precariousness of local populations and to save the local cultural and natural heritage [14]. Furthermore, it envisages the reinforcement of the capacities of the local actors, such as young people, the unemployed and women by involving them and giving them responsibility in all the phases of the project [15]. Likewise, the strengthening of partnerships with local communities and cooperations through the establishment of a multidisciplinary exchange mechanism at the national, regional and international levels. To this end, several houses have been rehabilitated, and workshops, training in traditional crafts, awareness days, and information exhibitions on the importance of this heritage, have been organized [16].

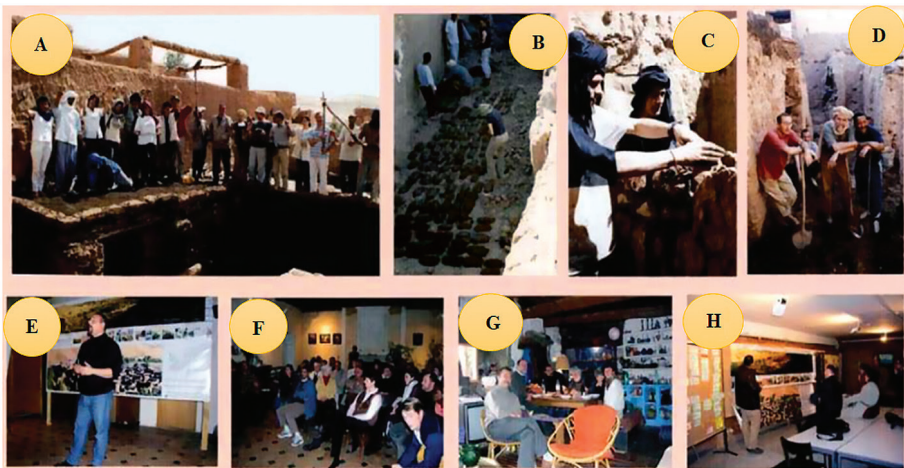


Figure 4. Rehabilitation of the ksar at Taghit: A) a group of masons celebrate the achievement of a house rehabilitation; B) production of earth bricks; C) wall construction; D) earth mixture; E) F) G) and H) training and exchange program [12].

After 2007, conservation of the material heritage was awarded definitively to the Directorate of Culture of Bechar [17]. In the limited budget granted for the rehabilitation of the ksour, the Directorate of Culture is focusing only on stabilizing the structure and rehabilitating public spaces (Figure 5).

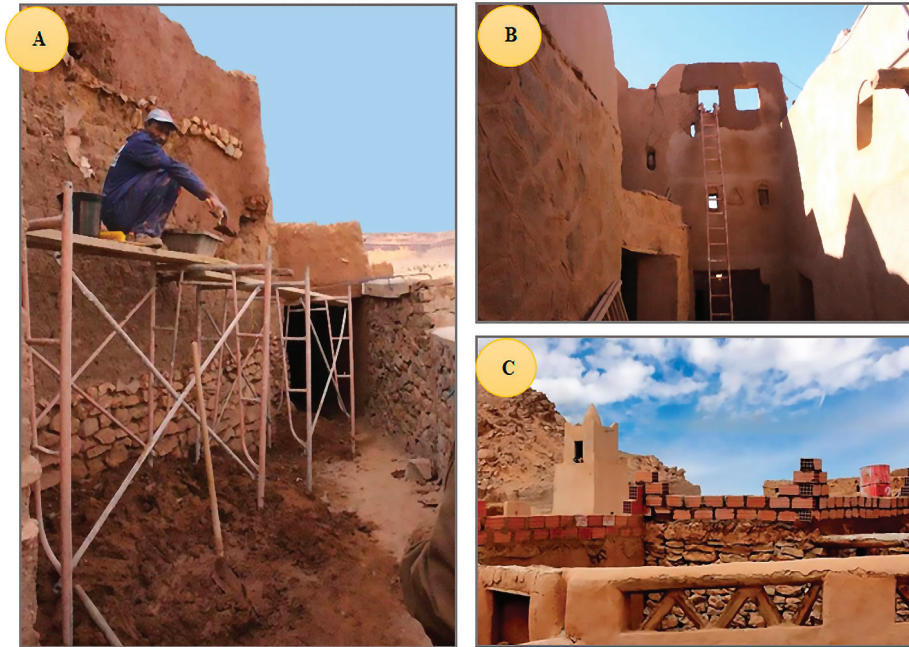


Figure 5. Rehabilitation of the ksar at Taghit under the supervision of the Directorate of Culture: A) plastering the exterior wall of the ksar; B) rehabilitation of the mosque; C) use of materials that are incompatible with the earthen construction [18].

#### 4.2. Owners' practices to preserve the ksar

The various interventions carried out by the state were, in the first place, a response to the statements of the structural problems and then to the social requirements. Being the first person to be concerned about their property, a citizen is already an actor in its preservation. Ownership gives them a sense of belonging and community life within a vision of common interest. To this end, some programs have involved citizens in the rehabilitation process, on the one hand, to renew fruitful relationships with communities, in order to understand their needs and shape a common vision of their problems. And on the other hand, to integrate an international vision through the application of a citizen participation approach.

In ksar Taghit, the programs carried out have opted for an effective approach. The citizens have been integrated into several phases of the conservation process in different ways, either by calling on master masons to train young people and integrate them into the work on the site, thus teaching them a trade in danger of disappearing and offering them a job, or by accompanying the inhabitants in the restoration of their old houses.

The inhabitants, aware of the economic and touristic stakes, have sought sustainable solutions to take advantage of their properties to obtain profits and incomes and to transmit a good image of their region and their culture. Some of them have converted their houses into artisan workshops to revitalize traditional handicrafts and revive the local markets. Others have converted their houses into guesthouses (Figure 6) and tea-rooms

(Figure 7), with restaurants that value the local cuisine, offering it in order to welcome tourists and revitalize local tourism. Others again, have converted their houses into a library or a museum to renew the link between the inhabitants, especially children (Figure 8). In the same way, several workshops and open days were organized to sensitize the citizens on the value and importance of the conservation of their Ksourian heritage.



Figure 6. Transformation of a house into a guesthouse



Figure 7. Conversion of a house into a tea-room.





Figure 8. Creation of a local library and a private archive center [19]: A) children enjoying an exchange meeting around books; B) private archive center.

## 5. Results and discussion

The experiences of conservation and rehabilitation of ksar Taghit have proved that it is possible to preserve this sensitive heritage and to slow down its degradation by intervening on the built framework. However, and facing the reality of the current context of the ksar, we cannot ignore the fact that this heritage is constantly threatened by abandonment and destruction and that the rehabilitation of the built framework alone is not enough to give it life, revitalize it and ensure the continuity of its functioning.

In order to preserve the image of the ksar, taking into account the requirements of contemporary lifestyle, it can be said that “façadism” has taken over in the majority of the operations of conservation, at the expense of the interior space which has, in most cases, been demolished. Today, the urban environment of the historic centers is interpreted essentially in terms of decoration embellishing new cities [20]. This trend of “museumification” of a space which was once a center that inspired life, has transformed it into a place visited briefly during a Saharan safari. But at what expense?

“The interest that I carry to the built heritage, historical or not, must not, in no way, be interpreted as a mark of pastism. I militate against all current forms of museumification, but for a memorial practice that conditions innovation” [21].

The restricted budget granted for the conservation of the ksar and the absence of a deep and multidisciplinary strategy have reduced operations of rehabilitation to its external envelope. The use of standardized materials, that are neither compatible with the material earth nor with the climatic requirements of the region, such as cement, parping and plastic for the waterproofing, have not only damaged the authenticity of the built environment but also caused surcharge loads that have fried the structure and prevented the earth, being a living material, from breathing (Figure 9). The non-respect of the initial shape of the ksar and its components, and the demolition of certain dwellings in order to build new constructions, have massively disfigured not only the soul of this collective cultural asset, but also its authentic history, whose collective memory is engraved in its alleys (Figure 10).

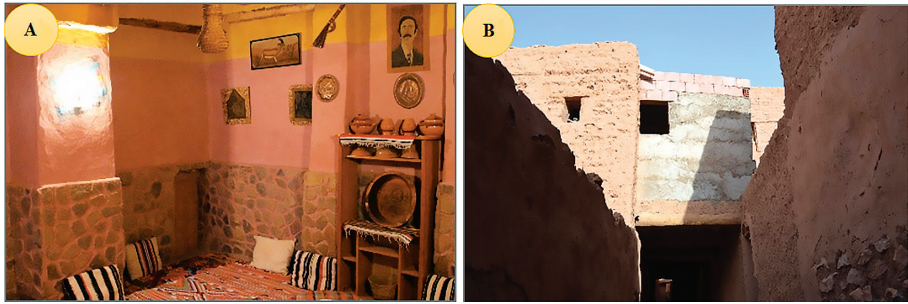


Figure 9. Use of standardized materials not compatible with the material, earth: A) the barrier that prevents the earth breathing; B) overloads that weaken the structure [22].

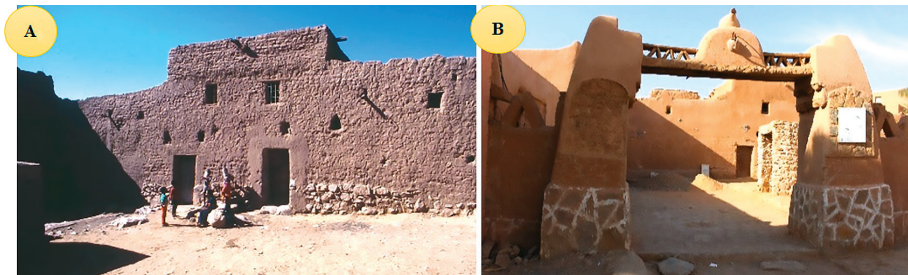


Figure 10. A) The main entrance is simple and modest and gives onto an exterior public place without ornamentation [23]; B) rehabilitation has changed its form and now appears as in figure B.

However, the biggest problem of the rehabilitation remains the absence of qualified masons and the disappearance of the traditional construction culture, except for a number of new masons who claim to have knowledge in this field, while the inadequate preparation of mud bricks and plaster, the use of untreated palm trunks and the failure to respect the requirements of earthen construction, have only accelerated the destruction of the ksar.

In the face of the negligence of the laws 98-04 [24] relating to the protection of cultural heritage, and the absence of charters and the national norms on earthen construction, this destruction will continue. Neglecting thus the cultural values and authentic identity of this common heritage and ignoring the social dynamics, which were once the engine of its stability, its perennality and the social cohesion of its community.

## 6. Conclusion

The classification of the ksar at Taghit as a national heritage site, as well as the benefit of several rehabilitation operations have certainly played a significant role in its conservation and its enhancement, compared to other ksour of the Saoura. However, the rehabilitation of the physical framework alone without respecting the historical and cultural value of the ksar and without taking into consideration the requirements of the earthen constructions, are not sufficient to ensure its continuity, sustainability and functioning.

In order to preserve the authentic value of the ksour, it is necessary to put in place long and short-term sustainable strategies based on reliable in-depth documentation and to valorize traditional building cultures, to involve the Ksourian community in all phases of the operations and promote the oasis ecosystem. The respect of its original form, the traditional building materials and the requirements of the region and the Ksourian community, are key elements for the success of any intervention.

This study provides several scientific perspectives regarding the problem of conservation and the enhancement of local building cultures, as well as the introduction of new technologies in the documentation of traditional architectures and conservation operations.

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### Notes

<sup>1</sup> Flat area of desert covered with wind-swept sand.

<sup>2</sup> Oued refers to river in arabic.

<sup>3</sup> Ksourian, inhabitats of the ksar.

<sup>4</sup> Toub in arabic, adobe in Spanish and baco in subsaharien countries: clay which, mixed with water and a small amount of chopped straw or other binder, can be shaped into sun-dried bricks

<sup>5</sup> Order of 24 Rajab 1420 corresponding to November 3, 1999, concerning the classification of historical monuments and sites.

<sup>6</sup> The second President of Algeria.

<sup>7</sup> A group of indigenous dark skinned Africans inhabiting parts of North Africa and the Sahel, who work for the other classes of the society.

<sup>8</sup> They are the descendants of the Prophet Mouhamed and his daughter Fāṭima.

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### Biographical notes

**Tinhinane Bachir-Cherif** is a Ph. D student in architectural, urban and landscape heritage at the University of Salah Boubnider, Constantine3, Algeria, from which she obtained her master's degree in urban design. She is currently doing her doctoral thesis on the identification and enhancement of earthen know-how in the south-western region of Algeria. Her research interests centre around earthen and vernacular heritage in Africa. She has published some papers on earthen architecture and the use of the local construction know-how. Over the past few years, she has participated in a range of workshops, national and international conferences, and competitions and has volunteered in projects related to community development and the rehabilitation of earthen heritage. She is a member of a research project, financed by Kyoto seika university in Japan, concerning the identification of construction know-how of earthen ar-

chitecture in five countries in Africa led by Oussouby Sacko (President of Kyoto Seika University), and other members, such as Deop Alfa (Vice President of ICOMOS), and other members from Japan and China. She is also a member of many scientific associations such as ICOMOS INTERNATIONAL, ICOMOS-ISCEAH and the Life Beyond Tourism movement, which promotes international travel and dialogue between peoples across the world (Florence, Italy).

**Messaoud Aiche** is currently a professor at the University of Salah Boubnider, Constantine3, Algeria. He obtained a Bachelor Degree in Architecture from the University of Constantine, Algeria. and a Master and PhD in Architecture from the University of Sheffield, England, and PhD in Architecture from the University of Constantine, Algeria. He has occupied many administrative posts at several universities; he is a member of the Scientific Committee of the Department of Architecture at Constantine University; and of the doctoral training committee at Constantine University and is responsible for the architecture education team at the same university.

**Oussouby Sacko** is a Professor at the Department of Liberal Arts, Faculty of Humanities at Kyoto Seika University, Japan; he was Dean of the Faculty from April 2013 until March 2017. He is currently President of Kyoto Seika University (since April 2018). He is also an affiliate of the Graduate School of Humanities and the Graduate School of Design (Architecture). Born in Mali (Bamako), he went to China (Beijing and Nanjing) after graduating from High School to pursue his education in the field of Architecture. He got a Bachelor's Degree from the South-East University (Dongnan Daxue), Nanjing China. He is a member of the Ordre des Architectes du Mali (OAM) and a member of many scientific associations such as: The Architectural Institute of Japan (AIJ), Architectural Design Association of Nippon (ADAN), The City Planning Institute of Japan (CPIJ), the Japan Association for African Studies (JAAS), the Society for the Study of Early Modern Kyoto, the International Union of Anthropological and Ethnological Sciences (IUAES), ICOMOS-MALI, ICOMOS-ISCARSAH, ICOMOS-ISCEAH and many others. He has conducted field research and worked on housing planning, policy and design in Mali and Japan. Recently, his main interest has been in community architecture, community re-design and architecture conservation, restoration in historical cities. He has recently conducted field studies in Japan, China, Mali, Mauritania's historical cities, Burkina Faso and Niger.

## Summary

Earthen architecture, notably the ksour of Saoura in Algeria, offers us architectural and urban jewels, and inspiring lessons of human ingenuity showing how past communities had to adapt to the difficult characteristics of the region and integrate themselves into the sensitive and demanding oasis ecosystem. Ksar Taghit (a fortified oasis village) is an exceptional model of this knowledgeable architecture and an example of resistance to the various natural and anthropic risks it has experienced over time due to the various conservation and enhancement programs and the efforts of its inhabitants to enhance their heritage and open it to visitors. Through this study, based on archival documents, and supported by observations and interviews with various actors and photographs showing the state of the ksar, we intend to present the conservation programs undertaken in the region and the impact of the efforts of the inhabitants on the

conservation of this property. This article, which is part of a doctoral thesis in progress, aims to present the impact of supervised rehabilitation and owners' practices on the conservation of cultural values and the authentic spirit of the place. Going beyond the material aspect of the conservation, the question arises about whether the efforts undertaken are sufficient to make this common heritage operational and dynamic.

### **Riassunto**

Le costruzioni realizzate con la terra, in particolare lo ksour di Saoura in Algeria, ci offrono gioielli architettonici e urbani ed esempi dell'ingegno umano che mostrano come le comunità del passato abbiano saputo adattarsi alle difficili caratteristiche della regione e integrarsi nel particolare ecosistema dell'oasi. Ksar Taghit (un villaggio oasi fortificato) è un esempio eccezionale di questa sapiente architettura e un modello di resistenza ai vari rischi naturali e antropici. Nel tempo si sono succeduti diversi progetti di conservazione e valorizzazione e considerevoli sforzi da parte dei suoi abitanti per dare valore a tale patrimonio e aprire il sito ai visitatori. Attraverso questo studio, basato su documenti d'archivio, osservazioni, interviste e fotografie che mostrano lo stato del villaggio, si vogliono presentare i programmi di conservazione intrapresi nella regione e la volontà degli abitanti per la valorizzazione di tale patrimonio architettonico. Questo articolo, che fa parte di una tesi di dottorato in corso, si propone di presentare gli interventi degli abitanti per la conservazione dei valori culturali e identitari del luogo. Al di là dell'aspetto materiale relativo alla conservazione, ci si pone la domanda se gli sforzi intrapresi siano sufficienti a rendere operativo e dinamico questo patrimonio culturale.