ENGAGE NETWORK
HERITAGE BORDERS OF ENGAGEMENT

ENGAGE PAPERS

CASE STUDY
[North Africa - Tunisia Hub]

A sensitive approach to promote the historic centers of south Tunisian medinas. Case of the place of the Roman Basins in the Oasis of Gafsa.

Authors:

Dorsaf Zid: Architect, Lecturer-Researcher, University of Carthage, Tunisia.
Azeddine Belakehal: Professor of Architecture, University of Biskra, Algeria.

Year 2021

UKRI Arts and Humanities Research Council
GCRF Global Challenges Research Fund

ENGAGE NETWORK
www.humanitarianheritage.com

GCRF - ENGAGE Network
ENGAGE PAPER SERIES

ENGAGE Regional Hub: Tunisia

A sensitive approach to promote the historic centers of south Tunisian medinas. Case of the place of the Roman Basins in the Oasis of Gafsa.

Authors: Dorsaf Zid and Azeddine Belakehal

2021

ENGAGE NETWORK
www.humanitarianheritage.com

Abstract for case study

This research aims to enhance, develop, and requalify the identity of Gafsa, a historically significant south Tunisian oasis but continuously facing the challenges of modernization. This study adopts a sensitive approach towards the urban heritage specifically characterized by the presence of water in outdoor spaces. The case study is the old district built around the "Roman basins" of Gafsa's Medina. This investigation highlights the importance of water presence in these historic basins and how much are their ambiences perceived and experienced by the inhabitants, particularly the young people. The outcomes argue that water is a generator of particular urban atmospheres that promote this place's both tangible and intangible heritage. This experiential study of practices relies on in-situ observations and interviews with users.

Keywords: Oasis, water, sensitive approach, ambience, Roman, urban heritage.

---

1. Introduction

As human establishments, Oasis constitute an important part of the North African heritage in Tunisia as well as the Maghreb countries. The harsh climatic conditions and other natural constraints, in these arid regions, impact strongly these oasitic territories. Hence, these densely populated living areas represent these territories' specific types of human settlements where water and hydraulic structures (Figure1) are of great importance and notorious significance. At present, these oasitic cities look marginalized, forgotten, fragile, and vulnerable, facing the urban sprawl and modernization challenges as well as local conditions of water stress. Therefore, cities and Oasitic societies are today, at the heart of a development problem in the Saharan and pre-Saharan regions and thus represent objects of study and reflection for several scientific research fields. Development is considered here in its spatial, economic, and social dimensions.

Figure1: Examples of ancient hydraulic structures located outside the cities of the hot arid regions. Right: A vernacular dam in the region of Bechar in the south-west of Algeria (Source: Authors). Left: A Roman structure inside the Oued (River) of Biskra's city in the south-east of Algeria (Source: Authors).

This study is focused on the old urban core of the oasis of Gafsa located in the southwest of Tunisia, called “Guebli- Gafsa”. Surrounded by a palm grove, this district is shaped as a medina and was built on the remains of the ancient Roman-Numidian city called “Capsa”.

Thus, this research attempts to question, identify, and then assess the importance of water presence in these basins as well as its impact upon the ambiental character of the place. Firstly, we ask about the influence of the water's presence in the basins upon the ways of occupying the place and living within. Secondly, we aim to know to what extent this water generated the environmental potential that affects the residents’ living practices and sensory experiences. We put forward the hypothesis that the water element is a generator of particular urban atmospheres, considerably contributing to the strengthening of the local cultural identity, the heritage enhancement, and the requalification of the medina of Gafsa.

2. Cities, water and heritage: A sensory approach

As a paradigm, the sensitivity concerns those relationships linking the humans, through senses, to the numerous natural as well as artificial environments surrounding them. The human senses transmit information emitted by these environments (natural and artificial) and induce perceptive and behavioral reactions from the human receivers (Bois and Austry, 2008).

Since the beginning of the preceding century, this sensory-based approach has been mentioned and adopted by various research fields including philosophy, anthropology, sociology, as well as urban planning (Simmel, 1912; Merleau-Ponty, 1945; Le Breton, 2006; Laplantine, 2005; Thibaud, 2010).

Historically, water is well-known as an essential urban design element even in the hot arid regions' cities. Irrigation water channels and fountains were often present within the urban fabrics of old towns (Figure 2).

Figure2 : In the past, the hydraulic structures were even located inside the hot arid regions cities' buildings. Right: A river branch transformed into an inner channel used for supplying Bou Inaniya madrasa in Fes, Morocco, Left: An antic cistern inside a house (Source: Authors)

Several post-industrial and contemporary cities' designers maintain a similar attitude towards the presence of water in the city. Indeed, several urban design projects of the Gulf cities' new districts include water as the main design component even if they are located in a region with extremely hot climatic conditions. For instance, Hail city, in the north of the Saudi Arab Kingdom (Latitude 27.63° N), knew several parks where water is used for agreement and aesthetic landscaping. (Figure 3).


Figure3 : Nowadays, the water is used for urban space's design in the Gulf countries despite the hot arid prevailing climatic conditions: Views of an urban park in the Saharan Hail city, Kingdom of Saudi Arabia (Source: Authors)

The behaviour was not so different within the built environment research field. The water has been considered as an aesthetic urban and architectural design component impacting emotions and awaking the senses (Llorca, 2007). The water acts visually, acoustically,tactilely, smelling and even through tasting on human senses. More than the perceivers' physical responses, these reactions are interconnected as well as related and/or based on personal experience and cultural memory specifically inside old and vernacular dwellings and cities (Le Breton, 2006; Monshizade, 2012; Landoulsi, 2021; Bengouga, 2019).

Such advantages have been operated in contemporary urban design particularly for historical urban sites. At first, one can notice the importance provided by the ICOMOS to such a component as a cultural heritage-related topic (ICOMOS, 2011). Also, several projects exploit the water history of the concerned context for their urban design. It is the case of B. Latarjet's "Marseille 2013" project (reference) and A. Bosshard's "Traces of water" project for three urban squares in Müden historical downtown (Geisel, 2011). In the hot arid regions, the southern Moroccan city Tiznit's urban project "Zerka, the blue source" has been a collaborative design practice experience involving researchers and the local stakeholders.This interdisciplinary action served as an effective and concrete approach for heritage rehabilitation (Breviglieri and Goeury, 2015). The water source was the project's plan structure basis of the urban square extension. It aims to revivify an eternal contact between the inhabitants and water as an identity symbol of this city (Naji et al, 2016).

3. Water and Gafsa oasis city: A historical overview.

Situated on the southern Limes, Gafsa illustrates an example of those roman pre-Saharan cities facing crucial water-based problems (Slim, 1987). In effect, the water sources were at the prehistoric existence and the origin of this region human settlements' territory structure (Camps, 2011; Castany and Gobert, 1954; Morales et al, 2015; Tlili, 2009). In addition, these arid provinces' richness was not earth but water. Furthermore, this latter impacted strongly the durability of these settlements until nowadays (Trousset, 1986). Despite the lack of archeological visible information at present, the small number of remains highlights

specific practices related to water management. J. Duvignaud revealed that the traditional implement (Gaddous) and the porch, where it was located, indicated the social life center of the village of Chebika. Hence, in these kinds of places, the irrigation time measure is basically a water measure, even these villages' durability measure per se (Trousset, 1986). The historic built parts, as well as the traditional practices and implements, could be considered as, respectively, tangible and intangible heritage. The famous Gafsa's Romans Basins are a notorious part of this still quite unknown heritage.

Gafsa's waterworks were cited, at first, by Sallust as an intra-muros located fountain of living water (Sallust, 1865). Embellishment has been undertaken for these hydraulic structures during the IInd century in order to enhance them at a sacred rank. Hence, they become the "Temple of the Oasis Water", an ancestor of the present Roman basins. A Latin inscription attests yet the extraction and veneration of this source during the antic times and its relationship to Water divinities such as Neptune and the Nymphs (Bordereau, 1907).

During the medieval period, the Arab historians and geographers highlighted: i) the large prosperity of Gafsa, ii) the importance of these sources, and iii) the durable conservation of several aspects of its antic heritage such as the Roman hydraulic structures. The fountain located inside the city was mentioned by Al-Yacoubi in the IXth century (Al-Yacoubi, 1984). Two centuries later, El-Bekri draws a very complimentary image of the city and described the very abundant water sources situated inside Gafsa, the noisy water channels network that irrigate the gardens and agricultural lands near the central place of the city. Also, he specified the Roman basins' dimensions and their construction materials (El-Bakri, 1858; Trousset, 1993). The formal and constructional characteristics of this antic heritage are also described in an anonymous author's text dating from the XIIth century; in addition to some information about the noticeable purity, transparency, and abundance of this "magnificent" structure's natural water sources (Zaghloul, 1985). Distinctively, the social practices occurring at that time in the place of the Roman basins are described by Hassan Al-Wazzan called Léon l'Africain. This latter attests that people circulated and washed their bodies with this natural source's hot water in the areas between the basins and the walls surrounding them. He also mentioned that the inhabitants drink this water after refreshing it for one to two hours (Léon l'Africain, 1896).

The authenticity of this place and the survival of its antic tangible and intangible heritages are attested by the 20th-century descriptions. These recent writings allow confirming the water-source-based durability of the present Gafsa's Hafsid fortified city (namely Kasbah) built on previous Byzantine foundations (Trousset, 1993). Similarly, the local name "Termid" given to the roman basins could be a survival of the antic language heritage (a derivation of the word "Thermes" as suggested by P. Trousset (1993, p.4)). Moreover, Ch. Saumagne (1962) informs about: i) the sexual and/ or religious-based division of the Roman basins' use (Women or Men basin / Christians' source / Saint's source), ii) Its location's importance due to the insertion of the local governor's house (Dar El-Bey) inside this historical hydraulic structure. At present, this urban square, and the antic hydraulic structures that it contains, do not differ from the oldest textual and iconographic descriptions' contents.

4. The Roman Basins of Gafsa

The Roman basins' place occupies the center of the old city (Figure 4). This place is at the lowest altitude level of the urban fabric (Binous et al, 2004). Organized around a square, this clustered urban fabric encloses a water system, dating from the 2nd century, which has been classified as a Tunisian national heritage since 1915. The “Roman basins” were built for the collection and veneration of the main water resurgence of the ancient city.

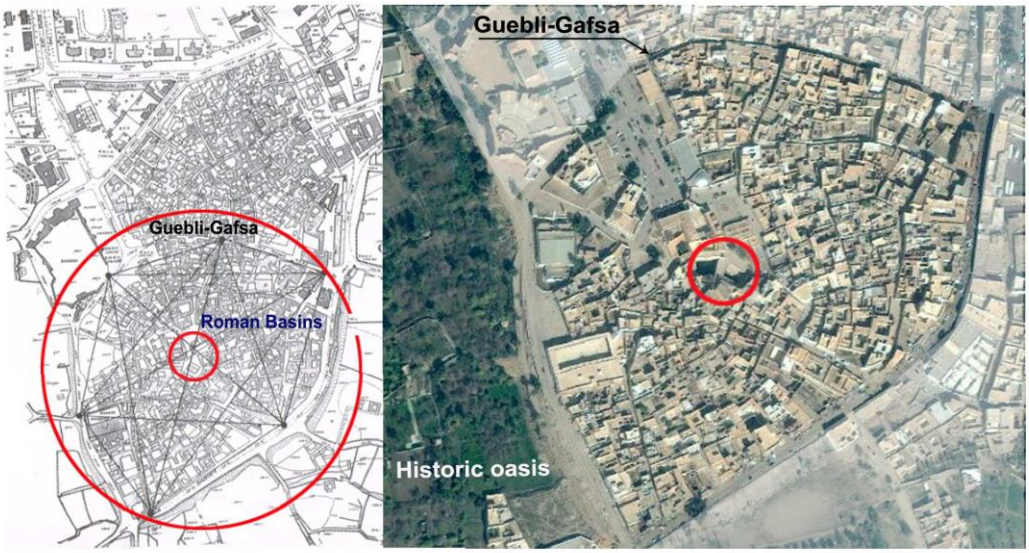

Figure 4: A map of the district Guebli-Gafsa highlighting the central location of the Roman basins in the ancient city (Source: Authors)

The smallest basin and the largest one are respectively located in the east and west parts of this historical urban square (Figure 5). Whilst the first basin has a narrow rectangular shape (16,5m x 6,5m) and a depth of 4m from the urban place ground level, the second one is trapezoidal with large sides' dimensions (19m x 16m) and 7m depth. Both are surrounded by high walls of cut stone. The basins are linked together using an arched underground passage (Figure 6). The water flows by gravity, from the small basin towards the large one. Near this latter, are located the ablution rooms. Finally, this water flows into the surrounding oasis and irrigates the palm grove.

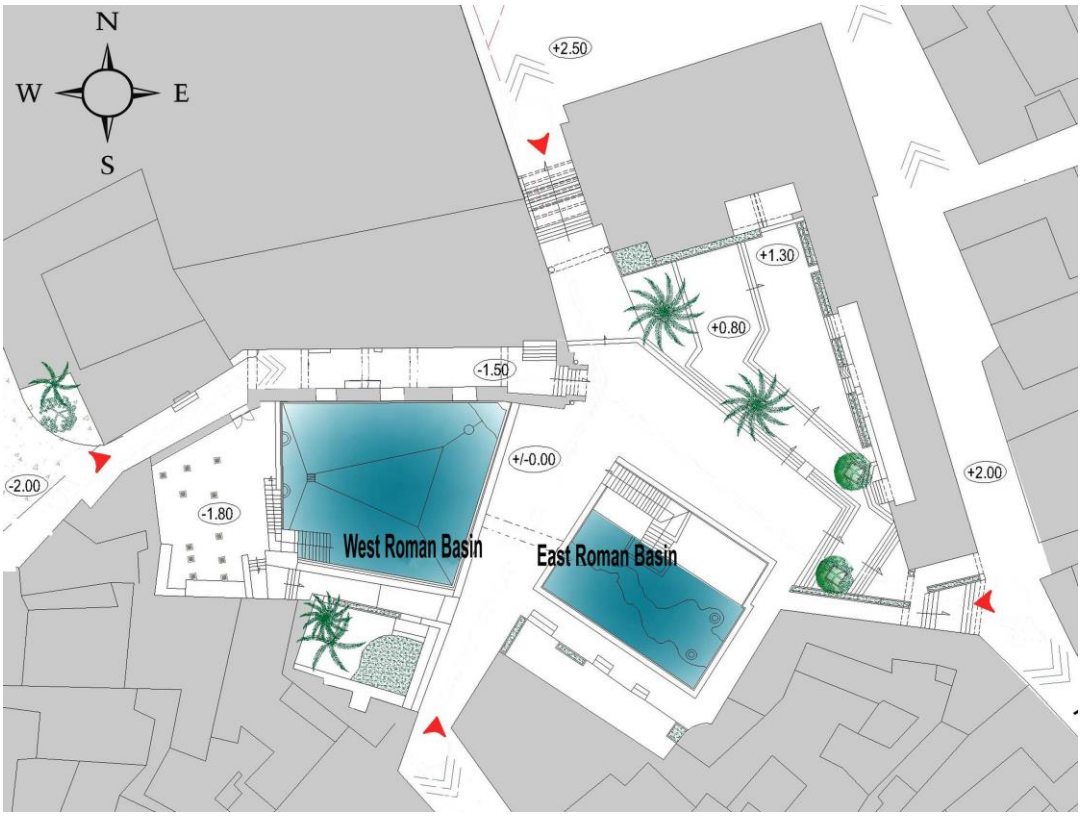

Figure 5: The floor plan of the roman basins' urban square (Source: Authors).

Figure 6: The underground passage linking the Roman Basins (Source: Authors).

In the historic document dating from the beginning of the 19th century, this heritage is named "Roman pool" referring respectively to their Roman origin and their uses as public baths by the inhabitants.

The current social life of this heritage urban place attests to the survival of this ancestral oasis human settlement. Several practices and uses of the inhabitants testify it. The physical factors that could be at the origin of such survival include the central position of the urban place, the presence of water in such a hot arid region as well as the diversity of attracting functions provided within this old district (Zid et al, 2021; Zid and Belakehal, 2019).

This practice survived over time. Within this traditional and climatic context, poor in terms of sports and leisure activities, the youngest people of Gafsa developed playful uses. Effectively, they take advantage of the depth of these basins to make "acrobatic dives" in the water. Since a few years ago, the natural water sources formerly supplying the basins have dried up definitively. Nowadays, the basins' filling up is done mainly during the hot season, from April to October. For this purpose, deep-sounding water is exclusively used. This has led to two distinct temporal situations: empty and full basins.

5. Methodology:

As a first step, an exploratory study has been undertaken through interviews, with some inhabitants of Gafsa's old city. The collected data content was analyzed and its outcomes were used for the construction of the survey's questionnaire. In a second step, this latter has been administered to forty-five (45) dwellers; a random sample of voluntary respondents, among frequent users of the place, and allowing the application of statistical tests. In addition to this survey tool, both people behaviour' observation and microclimatic characterization protocols have been developed and applied in this research work as a triangulation methodology (Angers, 1997). Among the various investigated aspects related to the Roman basins' water, those mainly presented in this paper are: i) the current users' perception of this urban square, and ii) what they share as an inherent part of the cultural memory of this place.

5.1 Investigating the users' perception:

This part of the investigation aims to study how the current users perceive this historical urban place and its atmospheres. For this purpose, a set of dimensions has been selected among those used in various previous research related to the architectural and/or urban spaces' ambiences (Amphoux, 2003; Belakehal, 2012; Chtara et al, 2016; Gharbi and Belakehal, 2016). Considered as perceptive conducts of the users, the considered dimensions include their believes, opinions, judgments, preferences, and representations. The significance of this whole of conduct is inherently associated with their context's dominant values and norms (Belakehal, 2013). These perceptive conducts shape, directly

and/or indirectly, the users' actions manners within the social and physical environment (Belakehal et al, 2009).

5.2 Cultural memory:

Identity is closely interconnected to those elements of the urban landscape that are strongly inherent to the inhabitants' memory (Molavi et al, 2017). As a concept, collective memory has been revealed by M. Halbwachs (1925, 1939, 1980, 1992) as social and historical encompassing all events shared by a community including those that occurred even before its members' births.

This concept has been transferred into the spatial and urban theoretical field through Aldo Rossi's book "The Architecture of the City" edited in Italian in 1966 and translated into English (Rossi and Eisenman, 1982) as well as Pierre Nora's "Between Memory and History: Les Lieux de Memoire" (Nora, 1989).
Cultural memory, as a part of the Collective memory, is distinctively related to a particular place whose urban various components revitalize its inhabitants' souvenirs and ancestral life (Boyer, 1994; Li, 2010). More and more, the cultural-memory-based approaches are adopted as urban design strategies aiming to involve historical urban centers' inhabitants in the revitalization process and the sustainability of their districts (Jahanbakhsh H. et al, 2015). In this research, the inhabitants' cultural memory has been undertaken from a specific angle: the dwellers' sensory relationships to the Roman basins' water. Our approach attempts to highlight the importance of the sensitive dimension in this place through a comparison of its occupants' past and present sensitive experiences. The aim is to identify what aspects can be considered "permanent" on the place and within the social and cultural representations of the inhabitants, and that can be useful for the enhancement and requalification of this Oasian heritage of southern Tunisia; those aspects putting into practice the link between the concept of "heritage atmospheres" (Belakehal, 2012) and "the genius loci" as describes by Christian Norberg-Schulz (Norberg-Schulz, 1981). The latter stated at the end of the 20th century that any place, whether natural or artificial, is nothing other than the interaction between its material (landscapes, constructions, objects, etc.) and immaterial (memories, beliefs, values, atmospheres, smells, etc.) components.

5.3 Questionnaire:

The perceptive conducts' frame studied here, to be identified and characterized, is related to i) the urban and architectural built as well as unbuilt (intangible) environments, and ii) The presence or absence of the water within the Roman basins. Thus, these conducts are firstly examined through their relationships to the users, the context, and the architectural space. At a second time, this will be undertaken mainly in association with the water in addition to the physical environment's other components. Besides, this study will explore to which degree these users' perceptive conducts are homogenous in the function of the presence or not of water in the Roman basins.

Also, several dimensions issued from the cultural memory concept were measured using the survey questionnaire. A special section, in the questionnaire, has been conceived for this purpose. Hence, a set of ten (10) questions were addressed to the inhabitants including the following topics: i) Their knowledge about the place's history, ii) The past and present roles of the Roman basins, iii) the difference of the hydraulic management of these basins, iv) The past and present inhabitants' uses of the Roman basins, v) these practices' duration, vi) the inhabitants' opinions about these nowadays practices, vii) the Roman basins' images still present in the inhabitants' memory. Other questions asked the dwellers about the attachment to this place and their reasons for staying in there and/or moving from away. In addition to the questions' contents, specific attention was given to the Roman basins' water-related aspects when analyzing the survey's results. In such a way, this sensory-based aspect constituted the focus of the cultural memory-related investigation.

6. The Roman basins' water as a perceptive conducts' object:

The preliminary survey revealed that most (92 %) of the users of the Roman basins square are people living in Gafsa city whilst a little part are Tunisians or foreign tourists (08 %). The following results are those of the local inhabitants' survey, a sample composed of more male (84 %) than female (16 %) persons and including various age sections, mainly the oldest people (more than 60 years / 38 %), the youngest one (Less than 30 years / 27 %) and in between (from 40 to 50 years / 22 %) (Figure 7).

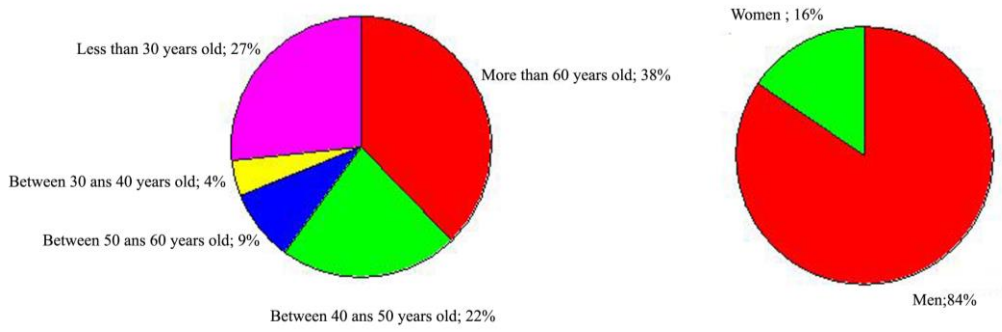

Figure 7: Percentage breakdowns of users of the Roman Basins place by age group and sex, (source: Authors)

This sample encompasses a tiny number of illiterate people (9 %) and a large number with various degrees of educational attainment (University / 27 %, Secondary school / 51 % and Primary school / 13 %). They are mainly public service employees or pensioners (33 % and 29%) as well as unemployed people (29 %). Most of these inhabitants have spent 20 to 50 years of their life in this district and could be considered as well adapted to this place. Their attachment to Gafsa city's old core has also been evaluated and only one quarter (25 %) of the respondents wants to leave it because of the general state of degradation of its

traditional dwellings. However, they express their intention to come back in order to visit the Roman basins' place.

Attesting that this district is the center of Gafsa city, most of the surveyed inhabitants (94 %) confirm that the Roman basins constitute their most preferred monument. In this area, theylike: i) the Roman basins (100 %), ii) the Medina usability (71 %), iii) Its situation and centrality (58 %), iv) the proximity of the palm grove and the weekly market's place (42 and 25 %), v) the narrow streets and covered passages (16 %), and vi) the local vernacular architecture of the Medina (5 %). In contrast, they don't like: i) the absence of water from the Roman basins (89 %), ii) the current deterioration and unsanitary conditions of the site (73 %), iii) the poor maintenance (58 %), iv) the uncontrolled constructions (28 %), and the intruders (5 %).

In terms of the urban and architectural quality of this urban square, all the respondents stated that the antic hydraulic structure is the most important component of this built environment. The drying up of the water sources has even been rated by all of them as the worst transformation that occurred within this historic square.

From one part, the new archeological museum and first floors built above the traditional houses surrounding this urban square are perceived as having reduced its open-to-sky landscaping character for two-third of the sample (68 %). From another, a third (30 %) of the surveyed inhabitants reject the felling of the trees providing, in the past, shaded areas in this square. Oppositely, the paving of the ground of the public square in stone and flowerboxes is positively appreciated by the inhabitants (56 %) as well as the new palms (46 %) and the Café (35 %) (Figure 8).

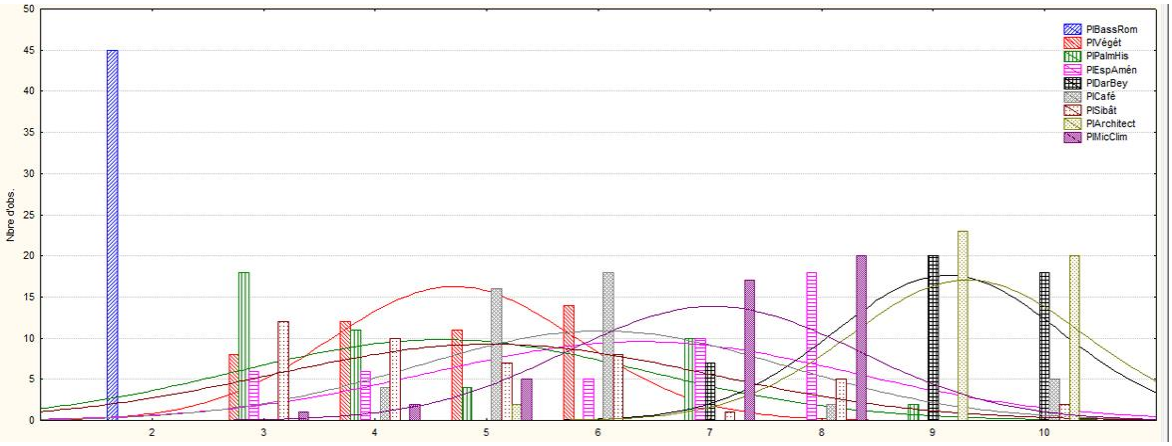

Figure8: Importance based ranking of the elements linked to the place of the Roman basinsaccording to the users (source: Authors)

Moreover, all the surveyed inhabitants (100 %) believe deeply that the water is the main source of valorization of this historical urban square. Water presence in the Roman basins allows perceiving this urban square as lively and vibrant (96 %), pleasant (80 %) as well as welcoming and friendly (78 %). The acoustic atmosphere of the Roman basins is also

frequently characterized by children's, birds', and water's (fun divings and swimming) sounds (53 %).

Furthermore, the participants were asked about the role of the Roman basins' water in the creation of specific ambiences to this historical urban space: i) all of them (100 %) attest that this water is the source of any perceived and/or lived ambiences, ii) the basins' water is perceived as a freshness source in this urban square for the most of the inhabitants (96 %),
iii) nearly three quarters (71 %) emphasize the practical role of this water, iv) and, respectively, more than two thirds (69 %) and then a half (58 %) note that it is a source of animation as well as underline the vitality provided by this water to the district's social life. In addition, a significant part of them (58 %) explained that the Roman basins water's freshness is associated with the coolness of the shaded areas created by the palms in the urban place.

Therefore, one can conclude that the Roman basins' water is the main component for the inhabitants' perception of this historical urban space's landscape and ambiences. But, what about the emotions aroused by this water for the inhabitants? In such a way, the dwellers were asked about the emotions triggered by this water considered as visual, acoustic and/or hygro-thermal physical stimulus.

When they are full water, the Roman basins affect positively the users' emotions in terms of visual aspects. Less than three-quarters (73 %) of them describe this hydraulic structure as "beautiful", "impressive" and "attracting". In the opposite situation, when no water is in or is stagnant, people feel the ambiental quality of the place negatively. Thus, this structure is qualified as "unpleasant", "repulsive" and "less beautiful" by more than two-thirds of the surveyed sample (68 %).

The major part of the respondents (80 %) is dazzled by the visual dynamic effects of water in motion and the bathers' jumps. This latter is their most preferred water visual effect (36 %). A significant number among them evoke the transparency of the clear (73 %) and (64
%) non-stagnant water. In addition, they underline the flickering of water under the sunlight in the Roman basins (58 %) and the mirroring effects and reflections it creates (29 %). On another side, two main sounds affect the acoustic environment of the urban square: i) The clacking of bathers' dives (82 %), and ii) the water flow (78 %).

The water refreshing effect is varying in respect of the specificities of the different zones within this urban square (Figure 9). This hygro-thermal physical character of the place is effectively perceived by the entire surveyed sample. The proximity to the Roman basins is the main parameter influencing both physical and perceptual sensory experience. Nevertheless, an amplification of this sensory effect has been revealed by the respondents.

Finally, it must be highlighted that the emotional ties of the inhabitants towards the historical urban place induced some negative effects due to the lack of water in the Roman basins. Three categories of feelings were extracted out from their discourses: i) depression (58 %), ii) anger (62 %), and iii) devaluation (58 %) (Figure 10).

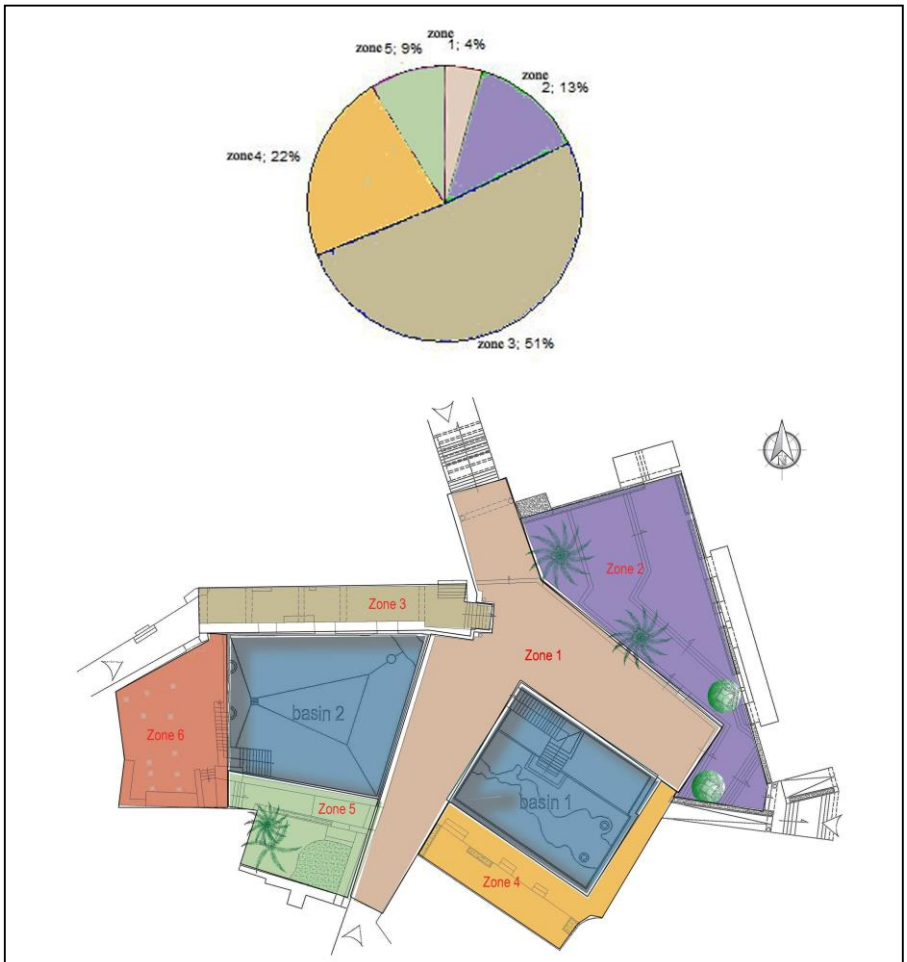

Figure 9: Users' perception of the water-cooling effect according to the spatial zoning, (sources: Authors)

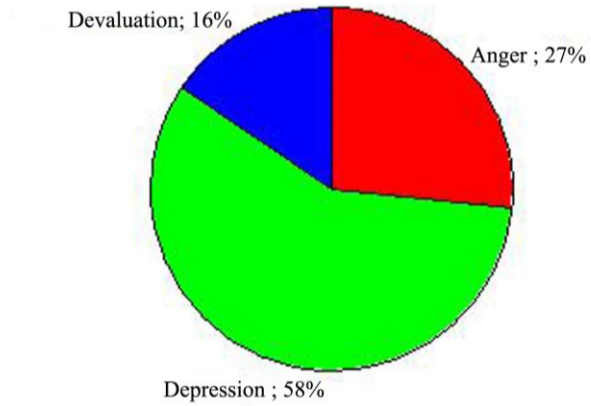

Figure 10 : Categorization of the negative affects felt by therespondents when the Roman basins are empty

7. The Roman basins as a part of the inhabitants' cultural memory

Nearly half of the inhabitants (44%) think that this place's history relates to its Roman origin. Less of the fifth (18%) among them enunciates that it is a water temple dedicated to the irrigation of the oasis, and a fifth (20%) ignores its history. However, the respondents agree about the heritage character of the Roman basins and the oasis of Gafsa despite the global ambiguity characterizing their knowledge of this place's history. A respondent said: "Oued El Bey" (Literally translated by the El Bey's river") possesses a large value within Gafsa's oasis heritage. This place is a sure value. This identity historical dimension is arising at the oldest dwellers (more than 50 years) and characterizes them mainly.

For most of the surveyed people, the Roman Basins constitute an emblematic work of Gafsa city. However, one can notice the participants' perception gap of the present and past roles of these basins. This gap is mainly linked to nowadays moisture stress situation and the change of the basins' water supply mode. Nearly three-quarters of the respondents (71%) consider as vital the role of the Roman basins when they were supplied from the natural water source. Particularly, the oldest people highlight that at the time when the water sources were abundant, they guaranteed the full oasis irrigation (33 %) as well as the continuous air refreshing in the old city district (11 %). In addition, the abundant source allowed using this water for domestic purposes (16 %). Furthermore, a quarter of the respondents (25 %) attributes to the Roman Basins an economic role because of the tourist tour including this place as well as the artisanal activities' continuously present and maintained through this pure water.

Nowadays, the Roman basins are perceived, for the third of the surveyed population (33 %), as an identity referent for Gafsa city due to its heritage value. Also, nearly the same number of people (31 %) informs that this role is extended to include microclimatic refreshing as well as leisure and amusement. The social and economic roles of the Roman basins are still perceived but by few respondents (respectively 28 % and 7 %).

The survey's outcomes highlight that the inhabitants' visual imagination refers to the sensitive qualities of the natural source water that supplied the Roman basins in the past. These qualities include the water's "abundance", "transparence", "dynamic" as a physical characteristic, and "temperature" for visually describing the water vapor. Two main sounds characterize the inhabitants' acoustic memory: in) the water flow and ii) the gurgling of the water rising from the rocks at the bottom of the Roman basins.

The physical body contact with "a summery cold water and wintry hot water" is cited by nearly half of the inhabitants (49 %). A third of them (33 %) indicate that this tactile physical relationship with water provides both a physical refreshing and a sensorial feeling of the cold water during the hot season mainly.

Five kinds of the Roman basins' uses and practices are still present in the inhabitants' minds:
i) Personal and interpersonal sensorial practices (cool off, touch water, walking and stopping to contemplate water and the children playing in there...), ii) Entertaining and amusement inside the Roman basins (competition of cabriolets and performances of the jumps in the water, catch the small fish...), iii) Folkloric rituals based on beliefs and the water source's veneration (blessing of the bride, stories and ancient legends), and iv) Festivities related to the annual cleaning and maintenance of the Roman basins. In addition, some visual and emotional links to the water and the Roman basins' work look as strongly present in the different place users' minds

(Old and present inhabitants as well as visitors). However, in some cases, people desire to be near the water only, especially within such a hot and arid context.

8. Discussion:

In this research, we are interested in the sensitive (past and present) experiences of users around a water system with patrimonial value, named, "the Roman basins", located in a particular oasitic historical center, that of the former urban core of the medina of Gafsa, in the south of Tunisia. Our analysis was carried out following several visits, mainly during the warm season and according to various temporalities.

It focused on the issues related to the valorization of oasitic spaces, through a sensory approach closely associated with the presence of water inside the urban fabric. Beyond its practical and utilitarian value, the research highlight the symbolic and sensitive dimension, or even fairytale of water contributing to the improvement of the living environment. This "source of architecture", as quoted by Th. Paquot (2002), has been at the center of our investigation. Water is considered as a catalyst for cultural practices where visual, sound, thermal, and inter-sensory dimensions contribute to the creation of an environment where life is good.

In the following, we will sum up the main outcomes of our in-situ research work. Hence, they provide the answers related to the impact of the environments generated by water in the development of a new approach to the sustainable valorization and requalification of oasian spaces; those territories that are, today, increasingly fragile and marginalized places.

The outcomes reveal that the urban place practices associated with the water attest about a sensory link, created by the user, towards the built environment components, in general, and with the Roman hydraulic structure in particular. The presence of water participates in the establishment of an effective relationship with this place. Hence, the water is a valuable element of the urban as well as the architectural landscape: i) enhancing the urban and ambiental quality of this public space, and ii) representing a convergence center and an essential component for this place's appropriation.

The attachment to the Roman basins and the water inside is clearly expressed by the inhabitants even if there is no water. This last situation induces effectively mourning feelings about this place and affects negatively the sensory perceptions and practices of the built environment. Moreover, the exaggerated positive subjective judgment, related to the hygro-thermal environment of the place, could be associated with their affective links towards the Roman basins as well as to their adaptation to the local hot arid context.

It must be also reminded that the visual, luminous, and acoustic effects of the water in the Roman basins have been reported by most of the respondents as the main key components for the perception and the atmosphere's characterization of this urban square.

From another side, the current users underline the original ambiental character of this place as did the ancient travelers before. These souvenirs allow evoking sensitive effects and sensory practices related to the water.

More than millenary water tanks, the Roman basins constitute an integral part of Gafsa's identity. They present a place for communal life surrounding water and induce the place's specific practices.

Also, the souvenirs attest to a certain sacral dimension of the place which is strongly related to the natural sources of water supply, in the past, the Roman basins. Some rituals commonly practiced by the inhabitants, within the urban square, are still present in their collective memory. The perennity of such conducts is confirmed by their similarity to those extracted from the travelers' stories and observed in the Roman basins' old iconographies.

It could be noted that the types of behaviors, the modes of perception (visual, auditory, tactile, etc.), the sensory experience of the place, as related by the respondents, were strongly conditioned by the different elements of the context of this oasitic region (historical, natural, socio-cultural, etc.) and equally by the architectural conformation of the Roman basins and by the presence or absence of water. This leads us to think about water devices, as a research object in its own right, able to generate a public space or an urbanity of quality and to develop - through a " water-sensitive strategy" - methods of conservation, requalification, and revalorization of the local oasis heritage.

9. Conclusion:

The outcomes of this research point out the present survival of the sensory relationships to the Roman basins' water often revealed by ancient travelers' descriptions. This sensory relation to the Roman basins, based on the water in there, has been revealed as currently alive within the inhabitants' memory.
Gafsa Roman basins are more than an antique hydraulic tank because they constitute, effectively, a strong component of this place's identity. There, people are still living together close to and around the water surfaces, jumping in there, taking a respite time as well as refreshing their bodies. They are sharing social and cultural activities hardly linked to this water's historical and sacred values. All of them attest to that cultural memory that transcended since the antic era of the city to the present time Gafsa.

However, both local cultural initiatives and national scientific research works must be undertaken in order to eliminate all doubt and ambiguity about the Roman basins' history

and disseminate the required information as an enculturation process applied to the local inhabitants. Such efforts should result in the creation of more intense socio-cultural and economic strategies with various benefits to the city's development.

The present research is a modest reflection aiming to reconsider the potentialities of water devices' atmospheres in the operations of valorization and requalification of oasitic historical urban centers. Both methodological and prescriptive ins and outs offer new tracksof exploration relating to the strategies and methods of preservation of monuments and historic centers.

In conclusion, this study undertook a topical research subject and confirmed that the oasitic environment that is currently recognized as a milieu that is at once "fragile", "constraining" and "marginalized", but coveted to be improved and enhanced. The contribution of our research work consists mainly in the consideration of the water-related sensitive dimension. This latter is distinct from the other historical, aesthetic, etc. aspects usually taken into account when operating on such historical urban sites. Effectively, this sensorial living cultural intangible heritage always encompasses the values, virtues as well as still valid teachings of existence in harmony with the surroundings' natural elements in a fragile milieu.

References:

Al Yacoubi. (1984). (Cited by El Arabi), Al Mudun el Magharibia, Alger : Entreprise nationale du livre, p 209-210. (in Arabic).

Amphoux, P. (2003). Ambiances urbaines et espaces publics. In : L'espace public en question : usages, ambiances et participation citoyenne. G. CAPRON and N. HASCHAR-NOÉ Editions. Toulouse : Université Toulouse Le Mirail, (Ecole Doctorale Temps, Espace, Société et Culture, n°3), pp. 50-56.

Angers M. (1997). *Initiation Pratique à la Méthodologie des Sciences Humaines*. Casbah Editions, Alger and CEC Inc. Editions, Québec.

Belakehal A. (2013), De la notion d'Ambiance. *Courrier du Savoir Scientifique et Technique* N°16, December, pp.49 -54.

Belakehal, A. (2012). Ambiances patrimoniales. Problèmes et méthodes. Thibaud, Jean-Paul and Siret, Daniel. Ambiances in action/Ambiances en acte(s) - International Congress on Ambiances, Montreal, Canada. International Ambiances Network, pp.505-510.

Belakehal A. et al (2009), Towards an occupant based conceptual model. Case of the natural luminous ambience. *proceedings of PLEA'2009 Conference*, 22-24/06/2009, Quebec City, Canada, pp.275-280.

Bengouga, S. (2019). *L'eau et la végétation dans la ville saharienne durant les périodes précoloniale et coloniale. Cas de la ville de Biskra.* Magistère thesis, Departement ofarchitecture, University of Biskra, Algeria.

Binous J et al. (2004). *Gafsa : une médina oasienne en Tunisie*, Association pour la sauvegarde de la Médina de Gafsa et Ambassade de France en Tunisie, Service de coopération et d'action culturelle.

Bois, D and Austry, D. (2008). Vers l'émergence du paradigme du sensible. *Revista @mbienteeducação*, volume 1, N°1, [Online] Available on : http://www.cidadesp.edu.br/old/revista_educacao/index. (accessed September 24, 2018).

Bodereau, P. (1907). La Capsa ancienne, la Gafsa moderne, Paris, A. Challamel, p.287, [Online] Available on : https://archive.org/details/lacapsaancienne00bodegoog/page/n14, (accessed February 24, 2015).

Boyer, M. Christine. (1994). The City of Collective Memory: Its Historical Imagery and Architectural Entertainments/M. Christine Boyer. Cambridge: MIT Press.

Breviglieri, M and Goeury, D. (2015-2016). Zerka, la source bleue et l'urbanisation des oasisde la méditerranée, projet de recherche interdisciplinaire [Online] Available on : https://zerka.hypotheses.org/zerka-2015-2016 (accessed December 20, 2016).

Camps, G. (2011). Escargotières, in *Encyclopédie berbère*, 18 [Online] Available on : http://journals.openedition.org/encyclopedieberbere/1999 (accessed June 20, 2014).

Castany, G. and Gobert, E-G. (1954). Morphologie quaternaire, palethnologie et leurs relations à Gafsa. Libyca, T. 2. p. 9-38.

Chtara C. et al, (2016), La mémoire ambiantale de l'espace sonore de Souks de la Medina de Tunis à travers les textes du XIX^{ème} siècle. *Proceedings of the Third International Conference on Ambiences*, (ISSN 978-2-9520948-6-3) 21-24/09/2016, Volos, Greece , pp.646-654

Gharbi. S. and Belakehal A., (2016), Vers une relecture d'un quartier de la reconstruction tunisienne d'après-guerre. L'ambiance comme outil de revalorisation. *Proceedings of the Third International Conference on Ambiences*, (ISSN 978-2-9520948-6-3) 21-24/09/2016, Volos, Greece, pp. 879-902.

El Bekri A-U, (1858). Description de l'Afrique septentrionale (1040-1094), Marc Guckin de Slane's translation, Paris: imprimerie impériale.

Geisel, E. (2010). Elaboration d'une méthode de qualification du paysage sonore : Le cas des quartiers durables allemands Kronsgergs et Vauban. Doctorate Thesis, ParisTech.

Halbwachs, M. (1992). On collective memory / Maurice Halbwachs. Edited, Translated, and with an Introduction by Lewis A. Coser. Chicago: University of Chicago Press.

Halbwachs M. (1980) The collective Memory. Chicago: University of Chicago Press.

Halbwachs, M., (1939). Individual consciousness and collective mind. American Journal of Sociology, 44(6), pp.812-822.

Halbwachs, M. (1925). Les Cadres sociaux de la mémoire. Paris: Alcan.
ICOMOS (2011). Intangible Heritage. Convention for the Safeguarding of Intangible Cultural Heritage. [Online] Available on : https://www.icomos.org/centre_documentation/bib/2011_intangible-heritage_complete.pdf.

Jahanbakhsh H. et al (2015). Methods and Techniques in Using Collective Memory in Urban Design: Achieving Social Sustainability in Urban Environments. Science Journal (CSJ), Vol. 36, No: 4 Special Issue, pp.19-31.

Landoulsi, I. (2021). L'âme de Nefta/RouhNefta, une perception sensible du bien-être en contexte oasien. Dans : Breviglieri, M. Gamal said, N. et Goeury, D. (eds.), Résonnances oasiennes. Approches sensibles de l'urbain au Sahara, Métisse Presses, vues d'ensemble Essais, p. 95-129.

Laplantine F. (2005). Le social et le sensible. Introduction à une anthropologie modale. Paris, Téraèdre.

Le Breton, D. (2006). La saveur du monde, une anthropologie des sens, Paris, Métaillé.
Léon l'Africain (1896). Description de l'Afrique tierce partie du monde. Vol. 3. Paris, Ernest Leroux.

Li, N. (2010). Preserving Urban Landscapes as Public History: The Chinese Context. The Public Historian 32: 51–61.

Llorca, J-M. (2007). L'eau en forme et lumière, ICI-Interface, Paris, France.

Merleau-Ponty M. (1945). La Phénoménologie de la Perception. Ed. Gallimard, Paris. Molavi, M. et al (2017). Is Collective Memory Impressed By Urban Elements? Management Research and Practice 9: 14–27.

Monshizade, A. (2012). L'eau comme élément d'ambiance, le jardin persan entre abondance et rareté. Doctorate thesis, University of Grenoble, France.

Morales, J., et al. (2005). First preliminary evidence for basketry and nut consumption in the Capsian culture (ca. 10,000Ŕ7500 BP): Archaeobotanical data from new excavations at El Mekta, Tunisia. J. Anthropol. Archaeol. [Online] Available on: https://www.sciencedirect.com/science/article/pii/S0278416514000919?via%3Dihub (accessed June 29, 2015).

Naji, S. et al. (2016). Tiznit, Aïn Aqdim, la source à l'origine de l'Oasis, DTG Société Nouvelle, p.35.

Nora, P. (1989). Between memory and history: Les lieux de memoire. Memory and Counter-Memory 26: 7–24.

Norberg-Schulz, C. (1981). *Genius Loci: paysage, ambiance, architecture.* Hayen: Pierre Mardaga-éditeur.

Rossi, A. and Eisenman, P., (1982). The architecture of the city. Cambridge, MA: MIT press. Salluste. (1865). Œuvre complète de Salluste, with Charle Durosoir's French translation for the collection Panckouke, new edition reviewed by M.J-P Charpentier and M. Félix Lemaistre, Paris : Garnier Frères editions.

Saumagne Ch. (1962), Capsa, les vestiges de la cité latine de Gafsa, Cahiers Tunisiens, 10, n° 37-40, pp. 519-531.

Simmel G. (1912). Mélanges de philosophie relativiste, contribution à la culture philosophique. F. Alcan Editions, Paris.

Slim, H. (1986). Le modèle urbain romain et le problème de l'eau dans les confins
du Sahel et de la Basse Steppe, In L'Afrique dans l'Occident romain (Ier siècle av. J.-C. - IVe siècle ap. J.-C.) Proceedings of Rome colloquium (3-5/12/1987) Rome : École Française de Rome, 1990. pp. 169-201. (Publications de l'École française de Rome, 134); [Online] Available on : https://www.persee.fr/doc/efr_0000-0000_1990_act_134_1_3873; (accessed September 4, 2015).

Thibaud, J-P. (2010). La ville à l'épreuve des sens. Coutard, Olivier ; Lévy, Jean-Pierre. Ecologies urbaines : états des savoirs et perspectives, Economica-Anthropos, p.198-213 [Online] Available on : https://halshs.archives-ouvertes.fr/halshs-00502591 (accessed August 13, 2015).

Tlili, M. (2009). Gafsa et les villages oasiens avoisinants : De la vie communautaire du début du XVIIIe s. à 1881, Association pour la sauvegarde de la médina de Gafsa.

Trousset, P. (1993). Capsa, In Encyclopédie berbère, 12 [Online] Available on : http://journals.openedition.org/encyclopedieberbere/2056 (accessed September 4, 2015).

Trousset, P. (1986). Les oasis présahariennes dans l'Antiquité : partage de l'eau et division du

temps, In Antiquités africaines, 22,1986. pp. 163-193; [Online] Available on : https://www.persee.fr/doc/antaf_0066-4871_1986_num_22_1_1130 (accessed September, 2015).

Zaghloul A. S. (1985), Kitab al-Istibsar fi Ajaib al-Amsar. Maghribia House Ed. Casablanca, Morocco (in Arabic).

Zid D. et al (2021), Expériences sensibles autour des bassins romains de la médina de Gafsa. 'Expériences sensibles de l'urbain au Sahara. Résonances oasiennes', Breviglieri M., Gamal Said N. et Goeury D., pp. 173-194., MetisPresses Editions, Geneva.

Zid D. and Belakehal A. (2019), Les bassins romains dans l'Oasis de Gafsa. Pratiques et vécus sensoriels. Presented at the 'LiMeS Project Life Between Mediterranean and Sahara', Workshop, 10/12/2019, University of Padoua, Italy.

ENGAGE

HERITAGE BORDERS OF ENGAGEMENT NETWORK

www.humanitarianheritage.com

For further information, contact our Office:

Centre for Architecture, Urbanism & Global Heritage
Nottingham Trent University
Arkwright Building, Shakespeare Street
Nottingham, NG1 4FQ
United Kingdom

E-Mail: cuagh@ntu.ac.uk
Phone: +44(0)115 848 4690