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The Alarming State of Tebessa's Archaeological Heritage in Algeria: Between Marginalisation and Preservation

* ¹ Medaregnarou Boubir Hana

¹ Institute of Architecture & Urban Planning, Batna 1 University, Algeria

¹ E-mail: boubirhana@univ-batna.dz

¹ ORCID: <https://orcid.org/0000-0001-6436-1348>

Abstract

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Historic cities in Algeria face intense urban pressures that often marginalise archaeological heritage in public policy, despite its cultural significance. This paper aims to expose the deteriorated state of Tebessa's archaeological heritage and to highlight the urgent need for a coherent preservation strategy. Tebessa, known since Antiquity as Theveste, contains an exceptional legacy shaped by Berber, Roman, Byzantine, Arab and French periods, yet this heritage is now in critical condition. The study adopts a qualitative diagnostic approach based on direct field observation, documentary review, and interviews with local authorities, focusing on the Gate of Caracalla and the Byzantine wall. Findings reveal multiple forms of degradation, including pollution, neglect, misuse, and inappropriate restoration that have compromised authenticity. Deterioration results not from ageing alone but from weak governance and unscientific interventions. Effective preservation requires a scientific, interdisciplinary and preventive approach rooted in international principles. Safeguarding Tebessa's heritage is an urban and societal responsibility demanding immediate institutional action.

Keywords: Historic city; archaeological heritage; preservation; conservation; restoration; urban pressure; Tebessa.

1. Introduction

Monuments are not merely old structures inherited from the past; they are enduring witnesses to the spiritual, artistic and technical achievements of earlier civilisations. They embody the historical continuity of societies and carry meanings that extend far beyond their original practical functions, whether residential, defensive, religious or commemorative. For this reason, humanity bears a collective responsibility to transmit them to future generations in their full richness and authenticity. This ethical principle is at the core of international heritage doctrine and is clearly affirmed in the Venice Charter of 1964, which recognises conservation and restoration as essential tasks requiring scientific rigour and cultural sensitivity. As Smith (2020), heritage conservation requires understanding both material fabric and cultural significance.

Yet the way societies treat their heritage often reveals a deep contradiction. While monuments are celebrated symbolically as markers of civilisation, they are frequently neglected, altered or even mutilated in practice. This tension is not new. As early as 1832, Victor Hugo denounced the destruction inflicted upon Notre-Dame de Paris, arguing that the damage caused by human action often surpassed that caused by time itself. His warning remains strikingly relevant today, particularly in historic cities facing unchecked urban growth, environmental degradation and weak heritage governance.

In Algeria, the issue is especially pressing. Historic cities are undergoing profound social and spatial transformation, and the pressure to respond to immediate urban needs often overshadows long-term preservation goals. In many cases, archaeological remains are treated as obstacles rather than assets. This marginalisation of heritage within urban policy reflects what Keller (2022) identifies as a structural disconnect between institutional priorities and the safeguarding of cultural assets. This situation is particularly alarming in Tébessa, one of the country's most historically significant cities. Despite its exceptional archaeological wealth, the city's heritage is increasingly threatened by neglect, pollution, inappropriate restoration and the absence of an effective protection strategy.

This paper seeks to draw attention to the alarming condition of Tebessa's archaeological heritage. Its objective is twofold: first, to diagnose the forms of deterioration affecting the city's most prestigious monuments; and second, to argue for a scientific and preventive approach to conservation. Through the examples of the Gate of Caracalla and the Byzantine wall, the paper demonstrates that heritage degradation in Tebessa is not the result of ageing alone, but also of inappropriate interventions and a wider failure of urban and cultural management.

2. Conceptual Framework

2.1. Archaeological Heritage as Cultural Testimony

Archaeological heritage may be defined as the set of material traces inherited from past civilisations and preserved in the present as evidence of human history. It includes monuments, ruins, urban fragments, artefacts and sites whose value lies not only in age, but also in the cultural meanings they carry. Such remains constitute a material archive through which societies understand their historical continuity, collective memory and identity.

In historic cities, archaeological heritage is not isolated from everyday life. It exists within lived urban environments shaped by contemporary needs, uses and conflicts. This dual condition makes heritage both valuable and vulnerable: valuable because it embodies historical depth and symbolic legitimacy, and vulnerable because it may be neglected, altered or instrumentalised when urban priorities shift. The archaeological richness of Tébessa was already documented by early 20th-century historians (Cagnat, 1909; Castel, 1912).

2.2. Heritage Marginalisation in Historic Cities Under Pressure

Marginalisation refers here to the gradual displacement of heritage from the centre of public concern and urban decision-making. In rapidly changing historic cities, this process often occurs when pressing demands for housing, mobility, sanitation, commerce or infrastructure are treated as more urgent than conservation. To address this fundamental tension, UNESCO Recommendation on the Historic Urban Landscape (UNESCO, 2011) provides an internationally recognised framework that moves beyond the protection of individual monuments to embrace the entire urban environment, including its social, cultural and economic dimensions. The Recommendation explicitly calls for the integration of heritage conservation into urban development policies, recognising that historic cities cannot be frozen in time but must accommodate contemporary needs while safeguarding their inherited values. As a result, monuments may survive physically while losing protection, visibility and institutional relevance.

This marginalisation is both material and institutional. Materially, heritage suffers from pollution, encroachment, neglect and incompatible uses. Institutionally, it suffers when public authorities lack a coherent preservation strategy, when interventions are fragmented, or when heritage management is disconnected from wider urban governance. The historical importance of Tébessa's Byzantine enclosure was highlighted by De Roch (1952), while De Ville Fosse (1952) described its monumental heritage as a unique ensemble in North Africa. The concept is particularly relevant to Algerian historic cities, where development pressures often confront archaeological remains without an adequate framework of integration and protection (Hadji et al., 2023).

2.3. Preservation, Conservation and Restoration

Although often used interchangeably, preservation, conservation and restoration designate different but complementary approaches. Preservation refers to the general objective of safeguarding the significance and integrity of heritage over time. Conservation refers to the measures taken to stabilise, protect and maintain a monument in order to slow deterioration. Restoration, by contrast, involves targeted intervention intended to recover legibility or structural continuity, while respecting authenticity, original substance and documented evidence.

According to international doctrine, particularly the Venice Charter (1964), restoration must remain exceptional, scientifically grounded and fully compatible with the monument's historical and material character. The study of earthen architectural heritage in Algeria (Saci & Bacha, 2024) demonstrates similar challenges regarding material compatibility in restoration. Recent research on compatible repair mortars (Akouche et al., 2025) provides methodological guidance for assessing restoration interventions, while documenting ancient materials is a prerequisite for any scientific restoration project (Allaouchiche et al., 2025). It cannot be reduced to a purely technical or cosmetic act. This distinction is essential for evaluating heritage interventions in Tébessa, where some works presented as restoration have in fact compromised the authenticity of the monuments.

2.4. Analytical Relevance to the Tébessa Case

The Tébessa case is analysed through the intersection of three conceptual concerns: the heritage value of archaeological monuments, the marginalisation of heritage within a pressured urban environment, and the distinction between scientifically grounded conservation and inappropriate restoration. This framework helps explain why deterioration in Tébessa is not simply a matter of natural ageing. It results from a combination of environmental stress, weak governance and interventions that do not always respect established conservation principles.

Using this conceptual lens makes it possible to interpret the Gate of Caracalla and the Byzantine wall not merely as damaged objects, but as indicators of a broader urban and institutional problem. Their condition reflects the wider difficulty of reconciling historic preservation with contemporary urban pressures in Algerian cities (Figure 1).

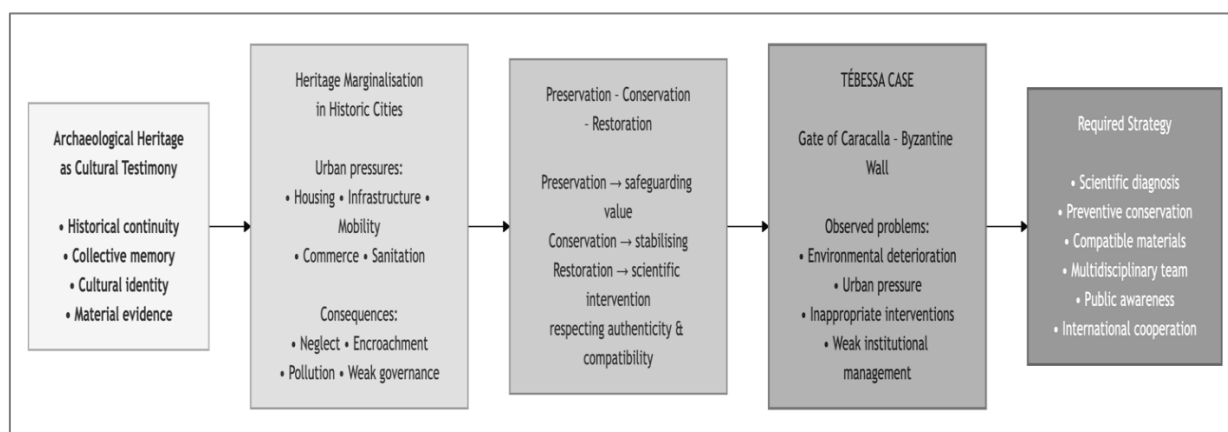


Figure 1. Analytical framework of heritage degradation and preservation pathways in Tébessa.
(Source: Developed by the Author).

3. Materials and Methods

3.1. Research Objective and Methodological Approach

The objective of this study is to reveal the deteriorated state of Tébessa's archaeological remains and to sound the alarm regarding the urgent need to revive and safeguard the city's prestigious historical monuments. To achieve this objective, the research adopts a qualitative diagnostic approach centred on direct observation. Observation is understood here as a deliberate and structured reading of a given situation in order to identify visible conditions, ongoing processes and patterns of degradation.

However, observation alone is not sufficient to explain the causes of deterioration or the logic behind unsuccessful restoration attempts. It therefore had to be complemented by two additional sources of information: documentary analysis and interviews with local authorities. Historical publications, archival references and previous descriptions of Tébessa's monuments were used to reconstruct the original significance and condition of the sites. Interviews helped clarify recent interventions, restoration intentions and the institutional context within which these heritage operations were undertaken. The methodological combination of field observation, documentation and interviews makes it possible to move beyond a purely descriptive account. It allows the study to compare past and present conditions, to identify the gap between conservation principles and actual practice, and to understand how urban pressures and technical choices jointly affect the survival of archaeological heritage.

3.2. Study Area: Tébessa and the Legacy of an Ancient City

Tébessa occupies a strategic geographical position between the eastern high plateaus and the Saharan Atlas. This location largely explains its historical importance, as well as the succession of civilisations that have settled there. The region preserves material traces of Berber, Roman, Byzantine, Arab and French occupations, along with prehistoric remains such as caves with rock art, Punic tombs and ancient habitation sites. The ancient city of Théveste was one of the great Roman cities of North Africa. Its importance is reflected in the remarkable diversity of its archaeological monuments, including the Temple of Minerva, the Roman basilica, the Caracalla site, the Byzantine wall and the Roman theatre. Together, these remains bear witness to the city's military, religious, urban and symbolic significance. Urban heritage preservation in Algeria also concerns more recent built fabric, as shown by Cherfi et al. (2024) in their study of Algiers. Beyond Tébessa, other Algerian archaeological sites face similar threats (Khellaf et al., 2023), illustrating a national heritage crisis. The requalification of urban identity through heritage, as demonstrated in the Kasbah of Algiers (Ouassila, 2023), offers insights for Tébessa. The Byzantine wall, built in the 6th century by the Byzantine general Solomon for both political and defensive purposes, historically delineated the perimeter of the old city. Its original configuration is highlighted by the 1842 military map of the Byzantine enclosure, now overlaid onto the current urban state of 2026. This overlay makes it possible to visualise clearly the permanence of certain layouts, but also the profound transformations of the urban fabric, revealing the shift from a compact defensive organisation to an extended and fragmented urban structure.

The enclosure has a broadly quadrangular shape, covering an area of approximately 60 hectares. The total length of the ramparts is estimated at nearly 2,100 metres, with sides varying between 280 and 320 metres. The walls reach an average thickness of 2 to 3 metres and an original height potentially exceeding 8 to 10 metres, attesting to their major defensive function. These ramparts were flanked by fourteen square towers, arranged at regular intervals to ensure effective surveillance and strategic control of the territory. The enclosure opened outward through four main gates, which served as obligatory passage points between the city and its environment. As illustrated in (Figure 2), this defensive system rested on a rigorous organisation, characterised by a relatively regular walled enclosure punctuated by towers and controlled access points, reflecting a logic that was simultaneously military, functional and urban.

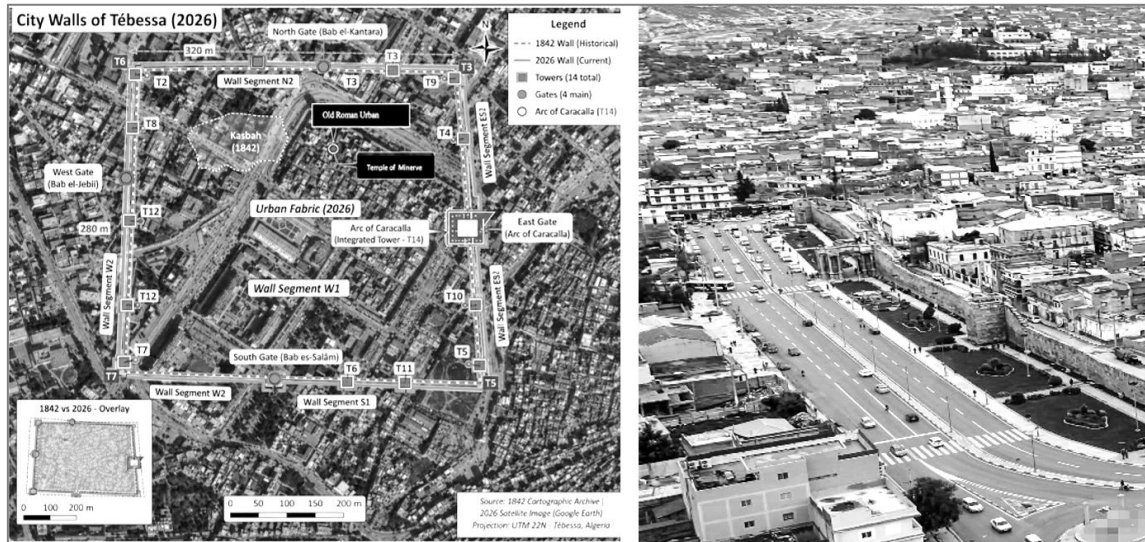


Figure 2. Gates and towers of the Byzantine wall in Tébessa.
(Sources: Google Earth and author's fieldwork. Composite by author).

Among these access points, one of the most emblematic is the Gate of Caracalla, a triumphal arch dating from AD 214. Erected in accordance with the testamentary provision of Cornelius Egrilianus, prefect of the Fourteenth Legion of Pannonia and a native of Theveste, this monument reflects the prestige and importance of the city during the Roman period. Situated at the junction of two major thoroughfares, it functioned not only as a monumental entrance but also as a structuring element of the urban organisation. Its subsequent integration into the Byzantine defensive system bears witness to a strategic reuse of ancient heritage, where symbolic and military functions overlap.

The architectural configuration of the monument is further illustrated through analytical representations and reconstructed drawings (Figure 3a–b), which highlight its tetrapylon layout organised around a central crossing. These documents provide a clearer understanding of the spatial organisation and architectural composition of the structure, particularly its four-sided configuration and symmetrical arrangement.

Serving as the northern entrance to the city, the monument is designed on a square plan of approximately 12 metres per side, at the intersection of two roads. Its total height is estimated at around 9 metres. Each of its four façades was originally pierced by a central archway, framed by granite columns with Corinthian capitals, characteristic of Roman tetrapylon structures. The monument displayed a symmetrical composition, with a balanced relationship between openings and vertical supports, ensuring the stability of the entablature and the upper structure.

Today, only a limited number of columns survive in a partial state, reflecting the progressive deterioration of the monument. Historical photographs taken in 1906 document the monument from its different orientations—north, south, west and east (Figure c–f)—and provide valuable information on its architectural condition prior to later transformations. Early architectural studies of the monument were also conducted by Menier (1938).

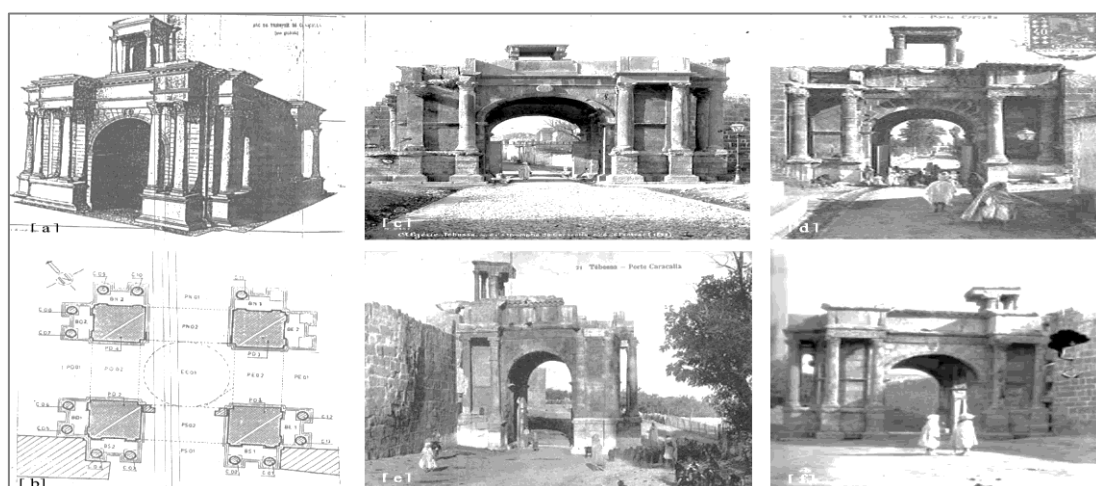


Figure 3. Architectural documentation and historical views of the Gate of Caracalla: (a) reconstructed perspective view of the tetrapylon; (b) horizontal plan of the monument at a height of 3 m; (c) triumphal arch, north side; (d) triumphal arch, south side; (e) Gate of Caracalla, west side; (f) Gate of Caracalla, east side. (Source: Menier, 1938).

Tébessa also preserves other major monuments of exceptional value. The Temple of Minerva, dating from the early 3rd century, is known for the richness of the decoration on its interior walls and for its archaeological collections. The basilical complex, located outside the walls of the old city to the north of the Porte de Caracalla, is surrounded by chapels, baptisteries, catacombs and gardens. Dedicated to Saint Crispina and dating from the late 4th century, it constitutes one of the

largest basilical ensembles in Africa. Not far from the central market are the remains of a 4th-century Roman amphitheatre.

The city of Tébessa initially developed from its Roman and Byzantine foundations inside the Byzantine enclosure during the Muslim and colonial periods. This historic core, covering approximately 60 hectares, concentrated administrative, religious and economic functions for several centuries.

After independence, the city experienced significant population growth, exceeding 190,000 inhabitants at the start of the 2000s, accompanied by substantial economic and urban expansion. This transformation led to a progressive extension of urbanisation beyond the Byzantine wall, with the appearance of new peripheral neighbourhoods and a gradual fragmentation of the historic urban fabric.

Today, the old city is characterised by a very high population density, reaching approximately 90 inhabitants per hectare, with nearly 30 dwellings per hectare, reflecting a situation of urban congestion inside the historic enclosure. This spatial expansion has profoundly altered the relationships between the historic centre and the modern city, weakening the functional and symbolic role of the archaeological heritage within the urban system.

Despite its inestimable socio-economic and historical value, this material heritage is increasingly exposed to multiple forms of degradation: natural ageing, environmental pollution, and above all, inappropriate restoration practices that fail to respect the materials and architectural integrity of the monuments.

The evolution of urbanisation in Tébessa between 1842 and 2026, illustrated by the different phases of expansion beyond the Byzantine enclosure, clearly shows this outward growth and its impact on the historic centre (Djakjak et al., 2024; Figure 4).

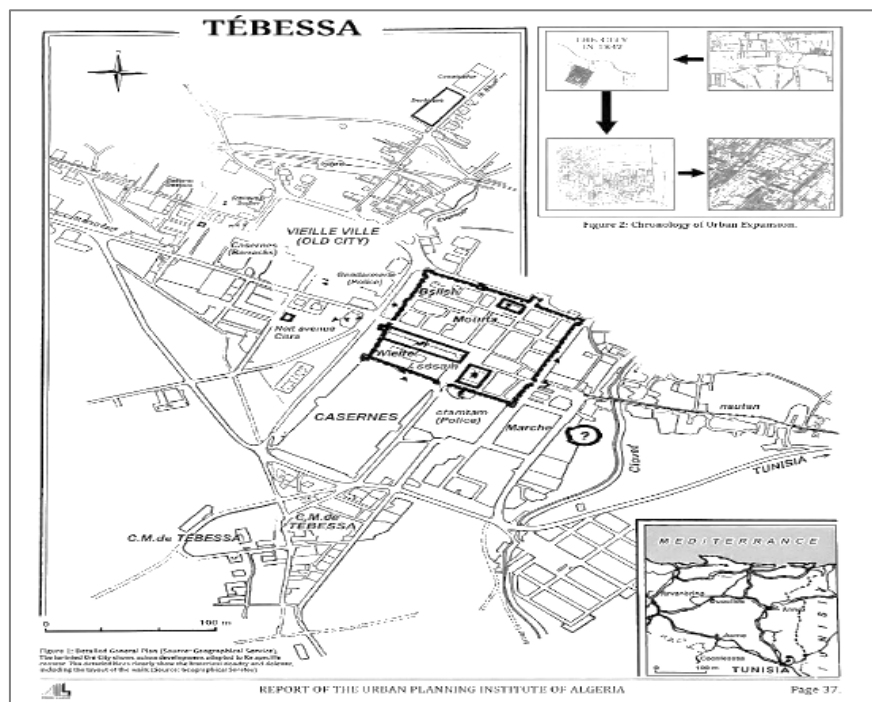


Figure 4. Evolution of urbanisation in the city of Tébessa since 1842 to 2026 .
(Source : Municipal planning documents,2023).

3.3. Analytical Framework

The research focuses on two complementary dimensions. The first concerns the material and environmental degradation of the monuments: erosion, pollution, unsanitary conditions, inappropriate uses, and the visible effects of neglect. The second concerns restoration practices themselves, particularly when interventions fail to respect the materials, forms, and historical authenticity of the monuments. The alarming state of Tébessa's heritage mirrors that of other Algerian archaeological sites, such as the rock engravings of Taghit (Malika, 2024), highlighting a national crisis in heritage preservation. The Gate of Caracalla and the Byzantine wall have been chosen as particularly revealing case studies, as they illustrate two major threats facing the heritage of Tébessa:

- on the one hand, the danger of technically and aesthetically inappropriate restoration;
- on the other hand, the cumulative effects of environmental pressure, urban density, and the absence of regular preventive maintenance.

The analysis of these two cases makes it possible to identify the structural weaknesses of current heritage management and to propose principles for more responsible conservation.

4. Results and Discussion

4.1. Tébessa's Archaeological Heritage: An Exceptional but Vulnerable Legacy

The first major finding of this study is the extraordinary richness of Tébessa's archaeological heritage. Few Algerian cities possess such a concentration of monuments spanning multiple historical periods. The city embodies a layered urban

memory in which Roman, Byzantine, Islamic and colonial traces coexist. This makes Tébessa not only a place of local memory, but also a site of national and universal significance.

However, this richness is precisely what makes its current condition more alarming. Heritage that should be central to the city's identity and development has instead been marginalised. Rather than being integrated into a coherent urban and cultural policy, the monuments often exist in isolation, exposed to damaging everyday practices and weak institutional oversight. The absence of a strong preservation and valorisation strategy has allowed deterioration to become normalised. Similar to Taghit's rock engravings documented by Malika (2024), Tébessa's archaeological heritage is in a critical state of endangerment.

4.2. Urban Pressure, Pollution and Heritage Marginalisation

The research shows that the degradation of Tébessa's archaeological heritage cannot be explained by time alone. It is the product of a hostile urban environment in which demographic pressure, overcrowding, pollution and lack of regulation combine to accelerate material decay. The old city, enclosed within the Byzantine wall, has experienced significant density, intense circulation of people and goods, and severe environmental stress.

These pressures have direct physical consequences for heritage structures. Pollutants accumulate on stone surfaces, creating black deposits that disfigure the monuments and accelerate their erosion. This degradation occurs despite the existence of a national legal framework designed to prevent it. Law No. 98-04 on the protection of cultural heritage (Algeria, 1998) establishes the legal basis for the classification of monuments, the creation of protected sectors, and the regulation of interventions on classified heritage. The law also provides for the development of protection and enhancement plans for archaeological sites (Algeria, 1998). Open areas around heritage elements are used in ways that are incompatible with their historical value, including dumping and informal sanitary use. Such practices reveal not only inadequate urban management, but also a troubling disconnect between the local population's daily needs and the symbolic importance of the monuments. Heritage is not protected because it is not sufficiently embedded in a living system of care, regulation and public awareness. Coastal archaeological sites in Algeria (Khellaf et al., 2023) suffer from comparable pressures of neglect and environmental degradation.

4.3. The Gate of Caracalla: A Prestigious Monument Damaged by Inappropriate Restoration

The Gate of Caracalla, an emblematic monument in the city of Tébessa, constitutes a particularly revealing case study of the excesses that can result from a poorly controlled restoration intervention. Although this monument has received sustained institutional attention – illustrated by its classification as national heritage in 1982 and by several successive campaigns of works – the technical choices made have unfortunately led to a profound alteration of its authenticity. Examination of this case allows not only an understanding of the mistakes that were made, but also the drawing of essential lessons for the future management of heritage sites in an urban context.

4.3.1. History of Interventions: A Chronicle of a Contested Restoration

First phase (2002–2003): A rushed intervention

A first major restoration operation was carried out between 2002 and 2003. This quickly sparked lively controversy, both nationally and internationally. Numerous experts, as well as institutions such as UNESCO, denounced an "inappropriate restoration", characterised by the massive use of reinforced concrete and exposed metal elements. These technical choices openly contradicted the fundamental principles of the Venice Charter (1964), particularly those relating to the authenticity of materials, the legibility of modern additions (which must remain distinct without disfiguring the ancient work), and respect for the original fabric. In this case, no clear distinction was made between the original and the restoration, and the new elements were made from materials with physico-chemical properties incompatible with the local limestone.

Suspension and relaunch (2004–2015): A missed opportunity

Faced with criticism, work was suspended in 2004 to avoid irreversible denaturation of the site. However, the project was relaunched in a second phase between 2011 and 2015, under the impetus of the Ministry of Culture, with the stated objective of resuming the restoration of the Gate of Caracalla as well as other monumental gateways (notably the Gate of Chella) on the basis of more rigorous specifications. Despite these intentions, results remain limited: work was again interrupted due to continuing degradation of the monument and the lack of suitable technical solutions, owing to insufficient preliminary studies and a lack of specialised skills in architectural conservation.

In parallel, urban requalification operations

were undertaken in 2015 to improve the immediate environment of the site. These consisted of freeing public space by relocating informal kiosks and rehousing certain families living near the Byzantine wall, with a view to promoting tourism and heritage. While these measures are laudable in terms of urban planning, they have in no way corrected the earlier structural errors.

4.3.2. Visual and Critical Analysis of the Induced Alterations

In-depth visual analysis of the monument (Figure 5i–n) highlights several forms of alteration directly attributable to past interventions.

- **Abusive restoration of the columns** (Figure 5i–j): The general and front views show that the restoration of the missing columns radically modifies the architectural reading of the arch. Instead of a reasoned anastylosis – i.e., a reassembly of existing ancient elements – a complete and conjectural reconstruction was undertaken, introduc-

ing a break with the original composition. This approach is more a matter of contemporary creation than of scientific restoration.

- **Material incompatibility** (Figure 5k): Details of the reconstructed elements reveal the use of materials foreign to the ancient stone: raw concrete, cement-based renders, and metal reinforcements. These materials, with coefficients of expansion and porosities very different from those of the original limestone, accelerate degradation phenomena (cracking, salt efflorescence, rendering detachment). Moreover, their smooth texture and greyish colour violently contrast with the warm patina and granularity of the historic stone.
- **Structural and visual imbalance** (Figure 5l): Certain interventions have generated both static and aesthetic imbalances, visible in the lateral views. The addition of heavy concrete masses to fragile ancient parts has modified the original load paths, threatening the long-term stability of the whole.
- **Exposed reinforced concrete and metal bars** (Figure 5m): The use of reinforced concrete is particularly problematic. The presence of exposed metal bars, unprotected against corrosion, testifies to an unsuitable implementation and a lack of finishing. These reinforcements, as they corrode, risk causing additional cracking in the ancient masonry. This process also accentuates the artificial and brutal character of the intervention, often locally described as the "concretisation" of the monument.
- **Alteration of the interior space** (Figure 5n): Transformations affecting the vaulted passage modify the architectural perception of the interior. Cement-based renders applied to the original voussoirs mask the reading of Roman vaulting techniques, while modern thresholds and fixings disturb the relationship with the ancient ground level.



Figure 5. Inappropriate restoration of the Gate of Caracalla: (i) general view of the monument; (j) frontal view showing reconstructed columns; (k) detail of column reconstruction using incompatible materials; (l) lateral view of the arch highlighting structural imbalance; (m) use of reinforced concrete and exposed metal bars; (n) interior passage showing alterations to the original structure. (Source: Author, 2026).

4.3.3. The Underlying Problem: Restoration Through Technical Convenience

The problem, therefore, does not lie in restoration itself, but in restoration carried out without sufficient respect for original materials, traditional construction techniques, and international conservation principles. Rather than conducting preliminary studies (archaeological diagnosis, photogrammetric surveys, petrographic analyses), the project managers favoured quick and economical solutions based on contemporary building know-how without adaptation to the heritage context. This case clearly illustrates the excesses of so-called "restoration by convenience", where the use of reinforced concrete and cement-based renders becomes a standard response, independent of the historical and aesthetic values of the monument. It also contradicts Article 12 of the Venice Charter, which stipulates that replacements for missing elements must harmonise with the architectural whole while remaining distinguishable from the original parts – a principle not respected here (Benkaddour & Tefiani, 2025).

4.3.4. Current Issues and Future Perspectives

Today, rehabilitation projects for the arch and the adjacent Byzantine wall are regularly considered in order to preserve and enhance this major national heritage site. However, any new intervention will imperatively need to:

1. **Diagnose the sanitary condition** of the existing reinforced concrete and assess its impact on long-term stability.

2. **Propose a selective removal** of the most damaging additions, where they do not contribute to immediate stability.
3. **Use natural lime mortars** and visually compatible stone, in accordance with the principles of differentiated treatment (distinction between old and new, but without false pretence).
4. **Involve a multidisciplinary team** (archaeologists, heritage architects, conservators, historic structures engineers) from the diagnostic phase.
5. **Involve the local community and international bodies** (UNESCO, ICCROM) in defining a project that respects authenticity.

The suspension of work, followed by unsuccessful relaunch attempts and peripheral requalifications, underlines the complexity of heritage management in a context of economic, urban and political constraints. Yet the Gate of Caracalla deserves more than a simple "urban requalification" of its surroundings: it demands an in-depth ethical and scientific reflection on what it truly means to *restore* an ancient monument.

4.4. The Byzantine Wall: From Historic Fortification to a Degraded Urban Fringe

The case of the Byzantine wall reveals another form of degradation: not an aggressive restoration, but a prolonged process of neglect and misuse. Once a major defensive and political structure, the wall now defines the boundary of the old city. However, rather than being preserved as a monumental urban landscape, several sections have become associated with unsanitary practices, reflecting a growing disconnect between heritage values and contemporary urban uses.

Field observations highlight the diversity and intensity of these inappropriate appropriations. As illustrated in Figure 6, the accumulation of waste at the base of the wall is a recurring phenomenon, particularly near gates and access points (Figure 6o, 6q, 6t), where the monument is directly exposed to everyday urban activities. The presence of household waste, organic matter and construction debris reflects not only deficiencies in waste management systems but also the normalisation of such practices within a heritage context.

In this regard, the spatial function of the wall has gradually shifted. Once a structuring element of the urban landscape, it is now increasingly perceived as a residual and marginal space. The absence of landscaping, signage and protective measures reinforces this perception and encourages further misuse. At the same time, certain passages remain heavily used by urban flows. The gates of the wall continue to function as active circulation routes (Figure 5p), generating intensive use that exceeds their original heritage function. This constant movement induces repeated mechanical stress on structural elements, particularly at thresholds, piers and stone facings, accelerating wear and diminishing their architectural legibility. More critically, some parts of the wall are affected by inappropriate sanitary uses. Areas located at the base of towers are informally used as public urinals (Figure 5s), revealing both a lack of urban infrastructure and insufficient regulation of social practices. These uses result in repeated chemical aggression, contributing to the deterioration of materials through the dissolution of binding agents and the alteration of stone surfaces.

In addition, risky human behaviours further exacerbate the situation. As shown in (Figure 6r), some users climb or occupy the monument itself, exposing both the structure and individuals to potential hazards. The additional load applied to already weakened areas may intensify existing structural disorders. The degradation of joints and the loss of material cohesion favour the detachment of stone fragments, whose potential (falling) represents a direct risk to pedestrians circulating at the base of the monument. Conversely, a few locally maintained sections suggest the site's potential for enhancement. These limited interventions demonstrate that relatively simple actions—such as cleaning, spatial organisation and the installation of protective measures—can significantly improve both the condition and perception of the monument. However, such efforts remain isolated and insufficient in relation to the scale of degradation observed. Overall, these conditions severely compromise the dignity, integrity and readability of the wall as a historical and urban entity (Figure 6o–t).

The problem is further intensified by the high urban density within the old city. Population concentration, continuous flows and inadequate sanitation infrastructure contribute to increased atmospheric pollution and physical pressure on the monument. The blackening of the inner facade is not merely an aesthetic issue but indicates ongoing physico-chemical degradation. Pollutant deposits, combined with moisture and climatic variations, accelerate material disintegration and surface erosion. The requalification of territories through heritage valorisation (Ouassila, 2024) could serve as a model for improving the Byzantine wall's condition.

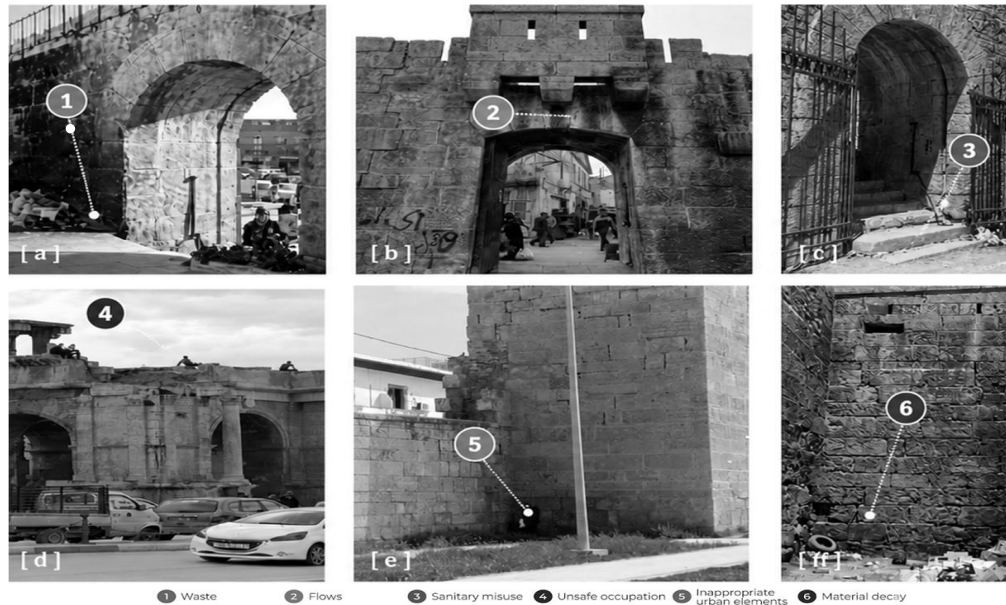


Figure 6. Unsanitary practices and environmental degradation affecting the Byzantine wall: (a) accumulation of waste near the wall; (b) intense human use of the gate; (c) waste disposal near monument entrances; (d) unsafe human use of the monument structure (climbing and occupation of the arch); (e) inappropriate sanitary use at the base of the wall; (f) pollution and dumping of solid waste along the wall. (Source: Author,2026).

The situation illustrated in (Figure 7) highlights the suspension of restoration works at the Gate of Cirta, leaving the monument in an unfinished and vulnerable condition. The presence of abandoned scaffolding, temporary structures and incomplete construction elements reflects a disruption in the continuity of intervention. This interruption exposes the monument to environmental impacts, material degradation and uncontrolled uses. In the absence of adequate protective measures, partially restored areas may become more fragile than original ones due to material discontinuity and structural instability. This case reveals not only technical challenges but also institutional and financial shortcomings, underscoring the absence of a coherent, continuous and sustainable conservation strategy.

Finally, intervention efforts remain incomplete. Restoration works initiated within broader archaeological protection programmes were interrupted, partly due to the controversy surrounding the restoration of the Gate of Caracalla. This interruption reflects a wider institutional challenge: when restoration projects lose credibility, authorities tend to suspend actions rather than reframe them within a more scientific and participatory approach. As a result, stagnation occurs, and in such contexts, stagnation inevitably leads to continued deterioration.

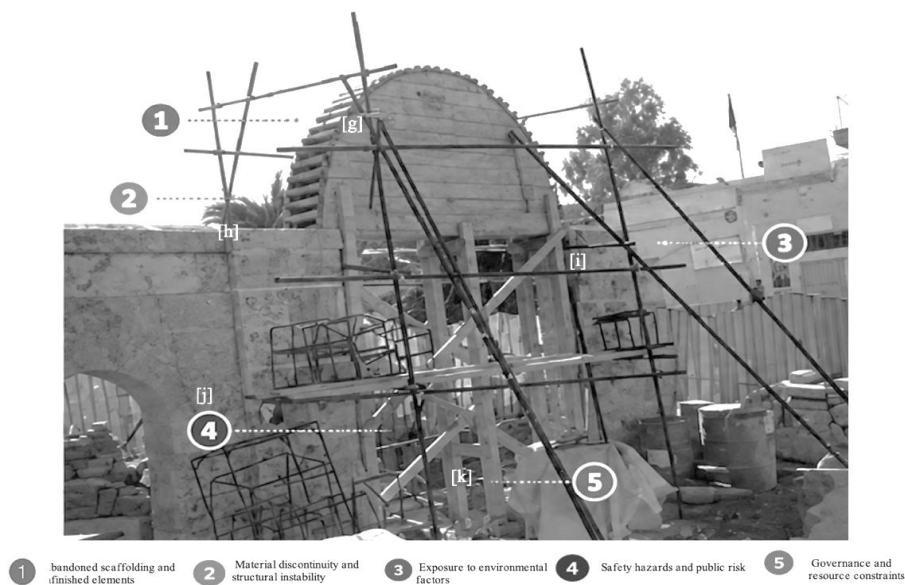


Figure 7. Suspension of restoration works at the Gate of Cirta: (g) Expose monuments to environmental and human risks; (h) Partially restored areas may become more fragile where material discontinuity and structural instability occur.; (i) Rain, wind and pollution accelerate deterioration of unprotected surfaces; (j) Unsecured sites endanger visitors, workers and surrounding communities; (k) Suspension of works reflects technical, financial and governance weaknesses in the conservation process. (Source: Author).

4.5. From Restoration to Scientific and Preventive Conservation

The alarming condition of Tébéssa's heritage demonstrates that preservation cannot be reduced to sporadic works carried out in reaction to visible decay. Conservation must begin with knowledge. Any serious intervention must be preceded by archaeological, historical and material studies capable of identifying the causes of deterioration, the structural behaviour of the monument, the compatibility of restoration materials and the long-term implications of intervention choices.

International doctrine, especially the Venice Charter, is explicit on this point. Restoration is not an improvised technical act; it is a discipline grounded in scientific research and respect for authenticity. As Akouche et al. (2025) demonstrate, compatible repair materials are essential for any scientific conservation intervention. Digital materials libraries (Al-laouchiche et al., 2025) could support long-term conservation planning in Tébéssa. In this sense, the failures observed in Tébéssa highlight the urgent need to reinforce links between restoration practice, university research and interdisciplinary expertise. Architects, archaeologists, historians, materials scientists and conservation specialists must work together, particularly when dealing with monuments of high symbolic and material complexity.

The study also shows the importance of preventive conservation. Waiting until monuments are severely damaged often leads to heavy and risky restoration operations. Preventive conservation, by contrast, focuses on regular maintenance, environmental control, cleaning, monitoring and the early treatment of minor defects. Such measures are often less spectacular, but they are far more effective in preserving authenticity.

For stone monuments affected by pollution, appropriate cleaning techniques such as controlled abrasion, laser cleaning or mist-based washing can be considered depending on the material and condition, always after prior testing and expert evaluation.

More broadly, Tébéssa needs an integrated heritage strategy. This strategy should combine scientific diagnosis, legal protection, urban sanitation, public awareness, technical training and, when necessary, international cooperation. Management plans for World Heritage sites (Özkaraca Özalp & Halaç, 2024) provide a useful framework for Tébéssa's heritage strategy. Heritage preservation must be seen as part of urban governance and sustainable development, not as an isolated cultural concern (Augelli & Bortolotto, 2025).

5. Conclusion

This study has shown that the archaeological heritage of Tébéssa is in a state of distress. The city's monuments, which bear witness to a glorious and multilayered past, are currently trapped within an environment that is often incompatible with their preservation and valorisation. The deterioration affecting the Gate of Caracalla and the Byzantine wall is not accidental. It results from the combined effect of pollution, neglect, urban pressure and restoration practices that do not always respect the historical and material integrity of the monuments. The paper also demonstrates that the protection of archaeological heritage is not merely an aesthetic or nostalgic concern. It is a scientific, cultural and societal imperative. Preserving monuments requires highly specialised knowledge, methodological rigour and long-term institutional commitment. The most damaging interventions are often those carried out without adequate research, appropriate materials or interdisciplinary expertise.

In the case of Tébéssa, urgent action is needed. The city requires a coherent preservation strategy based on scientific investigation, preventive conservation, specialised training and stronger coordination between heritage managers and academic research. It would also be beneficial to involve broader expertise, including technical guidance from international cultural bodies when necessary. Protecting Tébéssa's archaeological heritage means preserving an essential component of Algeria's cultural diversity and historical identity. It also means reaffirming that urban development and heritage conservation should not be seen as opposing forces, but as complementary dimensions of a responsible and forward-looking city.

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Conflicts of Interest

The author reports no conflicts of interest.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request. All photographs and visual documentation presented in Figure 4 were taken by the author in 2026 and are available for consultation. Documentary sources cited in the reference list can be accessed through the respective archives and libraries.

Institutional Review Board Statement

Not applicable. This study did not involve humans or animals.

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