



الهيئة الوطنية للمهندسين المعماريين
CONSEIL NATIONAL DE L'ORDRE DES ARCHITECTES

Rebuilding Izlloulen: Towards Resilient Architecture in Fragile Territories



Country: Morocco
Region: Beni Mellal-Khenifra
Province: Azilal
Commune: Ait Dumdis
Village: IZLLOULEN

Geographic Coordinates (*approximate*):

Latitude: 31.891° N

Longitude: 6.518° W

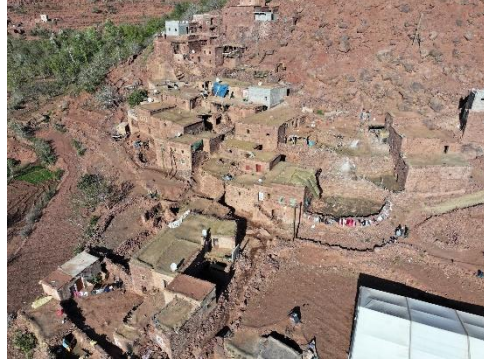
Elevation: ~1,400–1,600 meters above sea level

General Context

Izlloulén is a remote, highland village situated in the Central High Atlas Mountains of Morocco. It falls within the administrative jurisdiction of the rural commune of Ait Oumdis, in the Azilal Province, part of the Béni Mellal-Khénifra region. The village is embedded within a striking mountainous landscape characterized by steep slopes, narrow valleys, and dramatic escarpments formed by geological uplift and erosion. This area is part of a larger Berber cultural zone, with a population that maintains strong ties to traditional modes of building, agriculture, and community life.



General Context



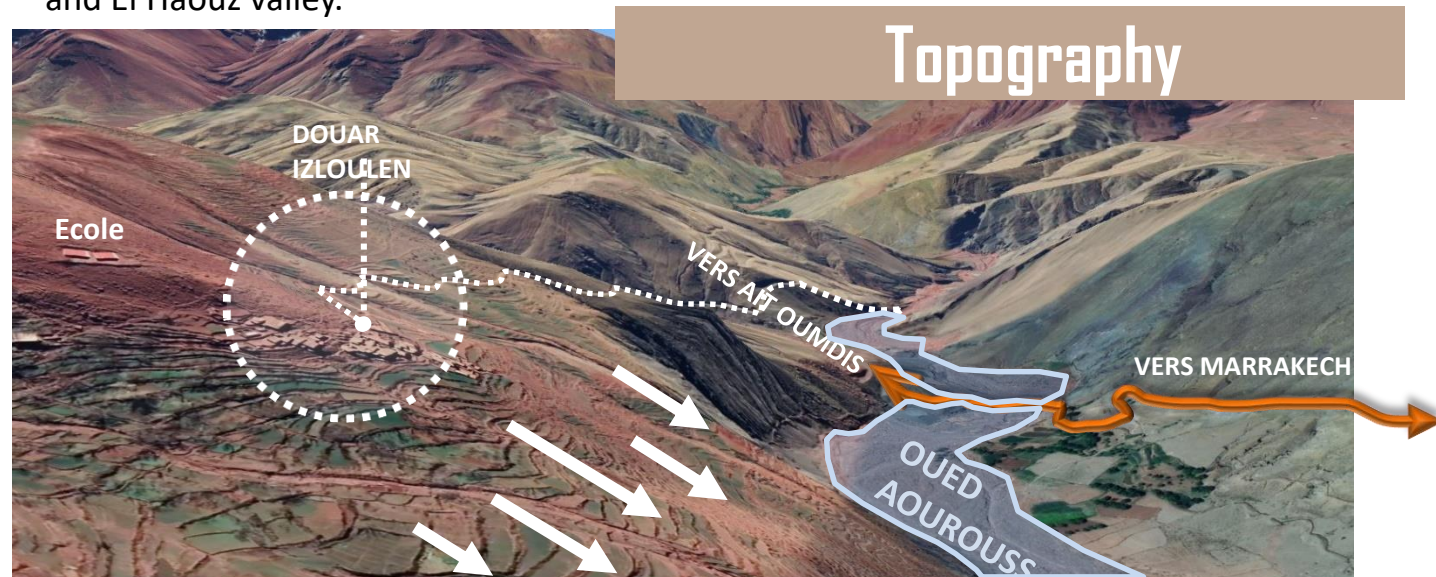
The built environment reflects vernacular highland architecture: compact stone or adobe homes, flat or slightly pitched roofs, and clustered settlements adapted to the topography.



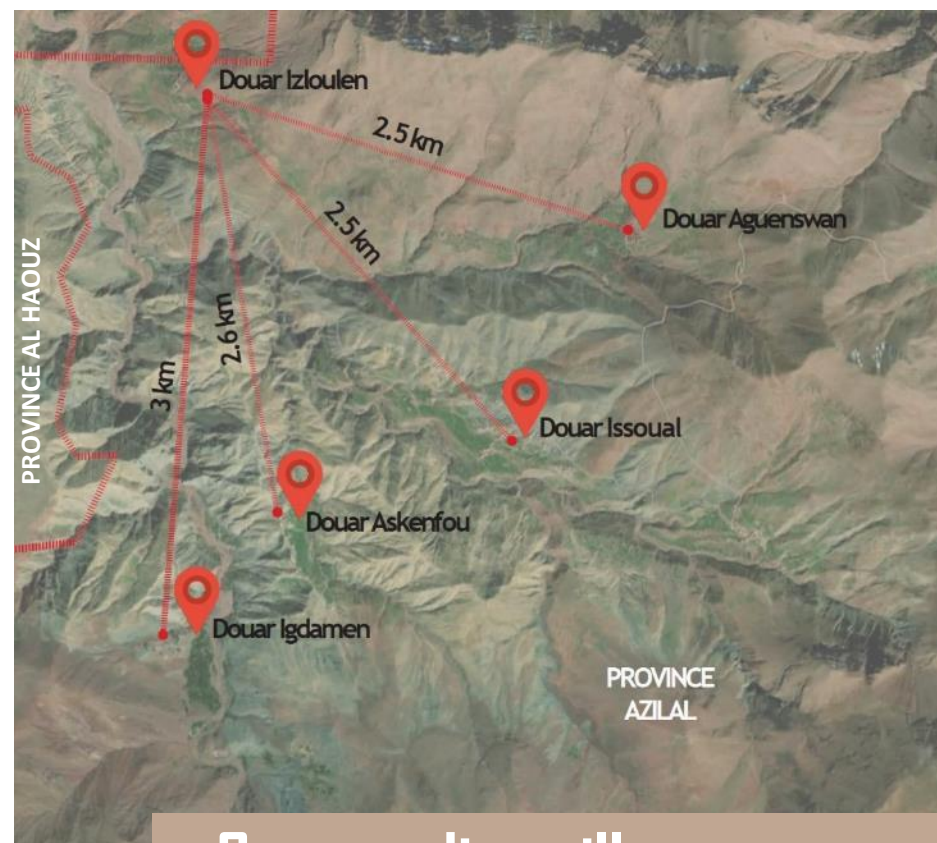
Accessibility- Topography



Izelloulen village is accessible via a 1km road from the paved road linking Ait Oumdis and El Haouz valley.



Izloulén village constitutes a gateway to the province of Azilal on the Marrakech side; its topography and its altitude (1790) allow the inhabitants and visitors of the village to have panoramic views of the Aourouss river and the Al Haouz valley. The topography is also a big constraints to roads and accessibility,



Surrounding villages

- 2,5 from Aguenswan
- 2,5 km from Issoual
- 2,6 km from Askenfou
- 3 km from Igdamen



Accessibility and Infrastructure

Access to Izelloulen is primarily achieved through a network of narrow, often unpaved mountain roads that traverse the foothills of the High Atlas. These winding routes reflect the rugged topography of the region and contribute to the village's relative remoteness. The closest urban center offering significant public services, administrative facilities, and transportation connections is the town of Azilal, situated approximately 30 to 40 kilometers to the northwest, with travel distances varying according to the chosen route and prevailing road conditions.

This geographic isolation presents both challenges and opportunities for the community. On one hand, it constrains access to essential infrastructure, healthcare services, and modern construction materials, thereby limiting the pace of socio-economic development. On the other hand, it acts as a protective factor, safeguarding the village's traditional modes of life, vernacular architecture, and cultural practices from the homogenizing effects of urban expansion and globalization.

Climate and Environment

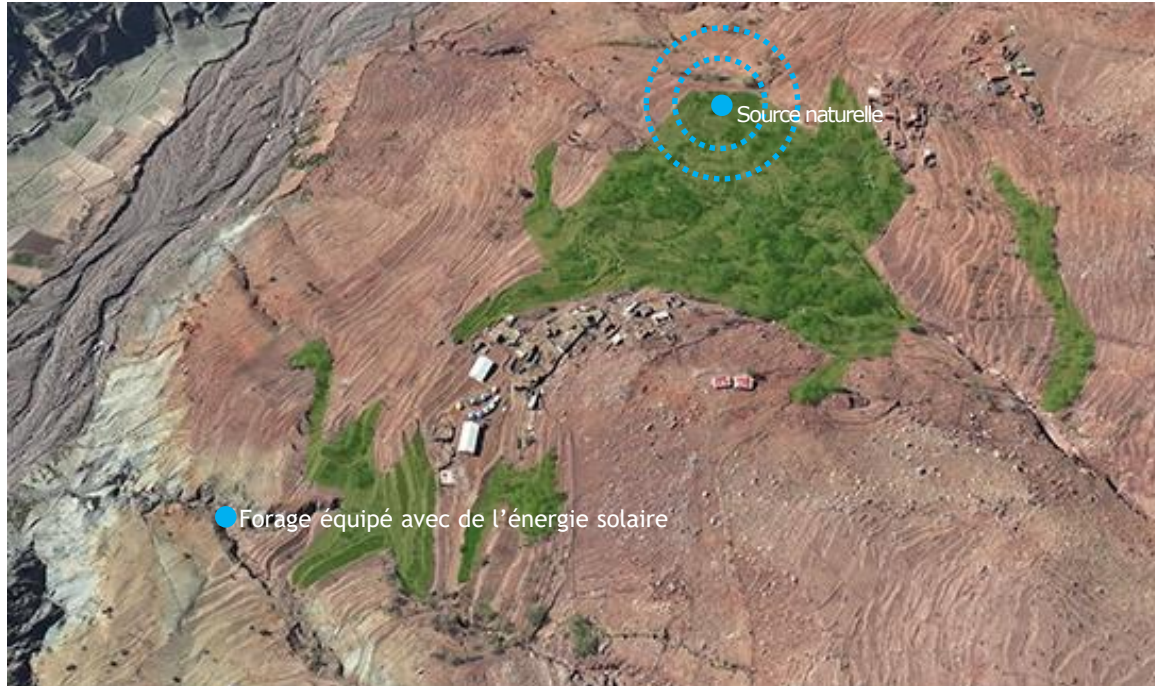
Izlloulen is situated within a mountain Mediterranean climatic zone, characterized by pronounced seasonal contrasts. Winters are cold, frequently accompanied by snowfall, particularly at the higher surrounding elevations, while summers are typically warm and dry. Precipitation is largely concentrated between late autumn and early spring, with snow serving as a critical source of water storage in the upper catchments.

Water availability in the village is sustained through seasonal springs and small river systems, which are carefully managed via traditional irrigation networks, locally known as *seguías*. These systems, maintained collectively by the community, ensure the distribution of water for agriculture and domestic use, reflecting a longstanding adaptation to the region's semi-arid conditions. The surrounding landscape presents a mosaic of ecological zones, including stands of juniper and oak, alongside extensive scrubland. However, much of the terrain has been transformed into terraced fields, carved meticulously into the slopes to support subsistence agriculture and seasonal pastoralism. These terraces not only provide cultivable land in the challenging mountainous terrain but also function as measures to prevent soil erosion and optimize water retention, underscoring the deep interconnection between the local population and their environment.



Economic Context

Agriculture



The economic life of Izlloulén, a remote village in Morocco's Azilal province, is deeply rooted in subsistence agriculture and small-scale pastoralism. These activities form the backbone of the local economy, shaping not only livelihoods but also the cultural identity and spatial organization of the settlement. Due to its mountainous location and limited access to markets, Izlloulén's economy remains largely self-sustaining, relying on the careful management of natural resources and communal labor practices that have evolved over generations.

Agriculture in Izlloulén is predominantly based on terraced farming, a vital strategy for cultivating steep slopes while mitigating soil erosion and maximizing water retention. These terraces support the cultivation of cereals such as barley and wheat, which serve as dietary staples, alongside legumes, potatoes, and seasonal vegetables. Fruit trees—particularly apple, walnut, and almond—are also integrated into the agricultural system, providing additional income through small-scale trade with neighboring towns.

Livestock, including goats and sheep, further complements the agricultural economy, supplying dairy products, meat, and wool, while also contributing to soil fertilization through transhumant grazing practices.

The economic life of Izlloulén, while resilient in its reliance on diversified subsistence strategies, is increasingly vulnerable to climate variability, rural depopulation, and the erosion of traditional knowledge systems. These pressures present significant challenges to sustaining livelihoods but also offer opportunities for innovative, context-sensitive interventions.

Economic Context

Agriculture/architecture



In Izelloulen, traditional stables (Rwa) constitute an integral part of domestic architecture, reflecting the close relationship between human and animal life in the High Atlas. Rather than existing as separate outbuildings, these stables are often incorporated into the same structure as the family dwelling, typically occupying the ground floor, while the living quarters are situated on the upper level. This arrangement is both practical and symbolic: it ensures the security of valuable livestock—primarily mules, donkeys, and occasionally horses—while allowing their body heat to contribute to warming the living spaces above during the cold mountain winters.

Constructed using locally available materials such as rammed earth, stone, and timber, these stables follow a vernacular architectural logic adapted to the region's climate and resources. The thick earthen walls provide natural thermal insulation, keeping the interior cool in summer and retaining warmth in winter. Flat roofs supported by wooden beams, often topped with compacted earth, add thermal mass and stability. Simple ventilation openings ensure adequate airflow without exposing the animals to harsh drafts, maintaining a balance between comfort and protection.

These integrated stables also serve multifunctional purposes, doubling as spaces for storing fodder, firewood, and agricultural tools. Their direct connection to the household reflects the intertwined nature of domestic life and subsistence activities in Izelloulen, where livestock remains essential for plowing fields, transporting goods, and supporting the agrarian economy in the challenging mountainous terrain.

Economic Context

Tourism



Tourism, though limited in scale, is gradually emerging as a supplementary economic activity in Izelloulen. The village's dramatic High Atlas landscapes, traditional earthen architecture, and cultural authenticity attract small groups of domestic and international visitors seeking immersive experiences in rural Morocco. Tourism primarily takes the form of guided trekking, homestays, and cultural exchanges, which provide very modest but vital income to local households while fostering an appreciation for the region's natural and cultural heritage.

Craft Activities



Complementing agriculture and tourism, traditional crafts remain an important element of Izelloulen's economic fabric. Local artisans, often women, produce handwoven textiles, wool carpets, and embroidered garments, drawing on techniques passed down through generations. Men typically contribute through woodworking and the crafting of utilitarian objects such as tools and decorative architectural elements. These crafts not only serve household needs but also provide goods for trade in nearby markets, reinforcing the village's cultural identity while offering a means of income diversification.

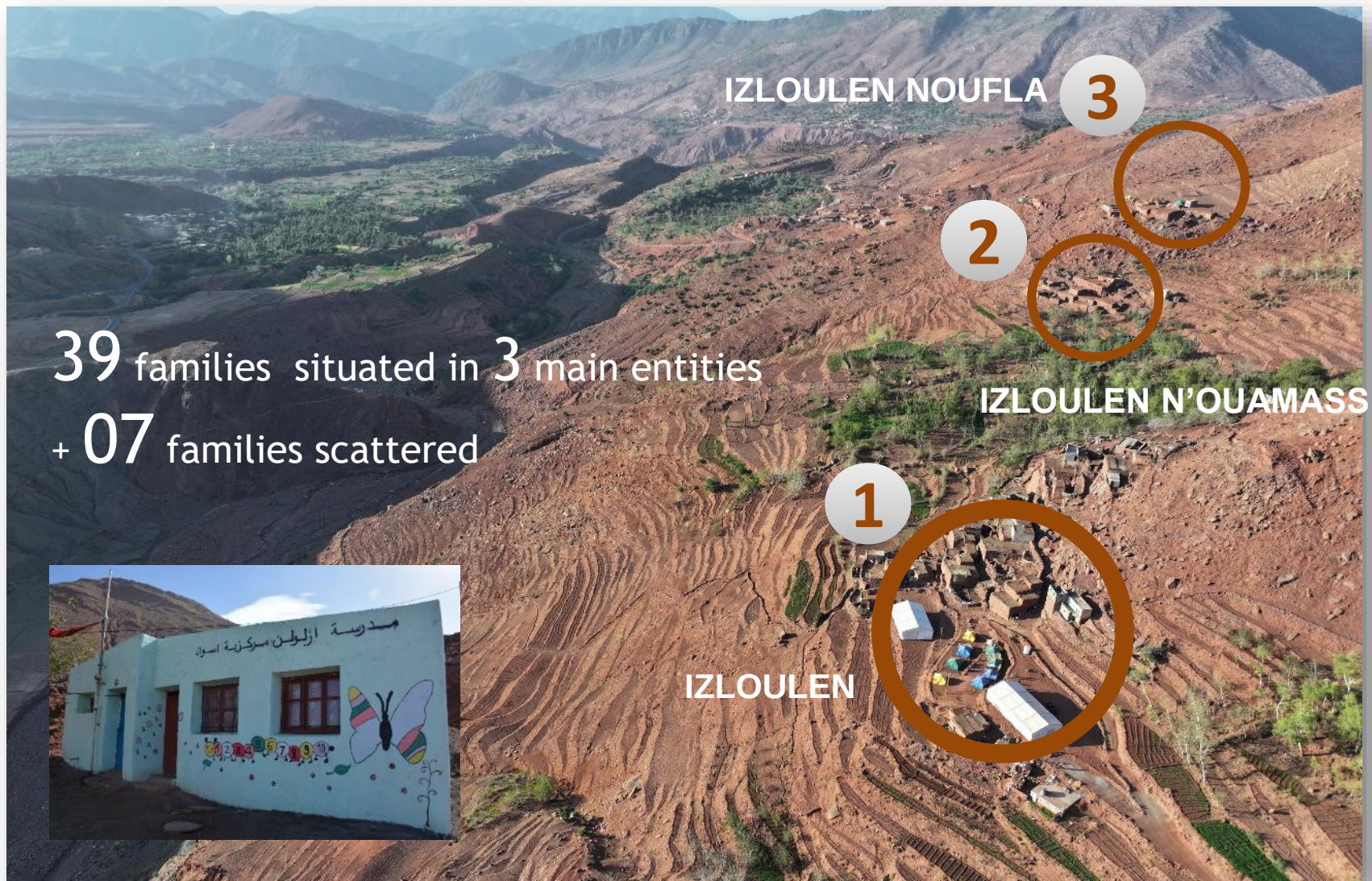
Landscape and Cultural Significance

Izlloulen is part of a broader landscape of intangible cultural heritage of the Atlas: oral traditions, agricultural practices, and communal labor structures. The village's vernacular architectural fabric is rooted in locally sourced materials—primarily stone, earth, and wood—and relatively adapted to seismic and climatic conditions. Recent development pressures and modernization initiatives risk re even thought disrupting these fragile balances.



Village Spatial Composition (3 main small areas)

- Total Area of the village : 19 Ha
- Population: 350 habitants, 46 families
- Medium Family size : 8 people/family
- Medium Housing area: 64 m²

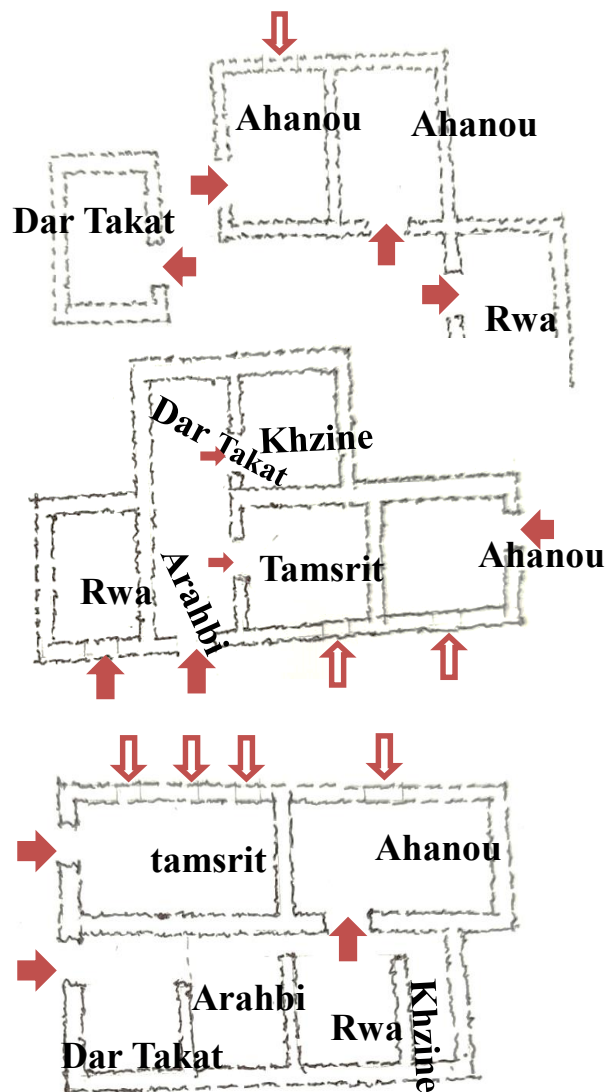


- Existing Equipement: Primary School
- 28 children: 19 girls and 9 boys

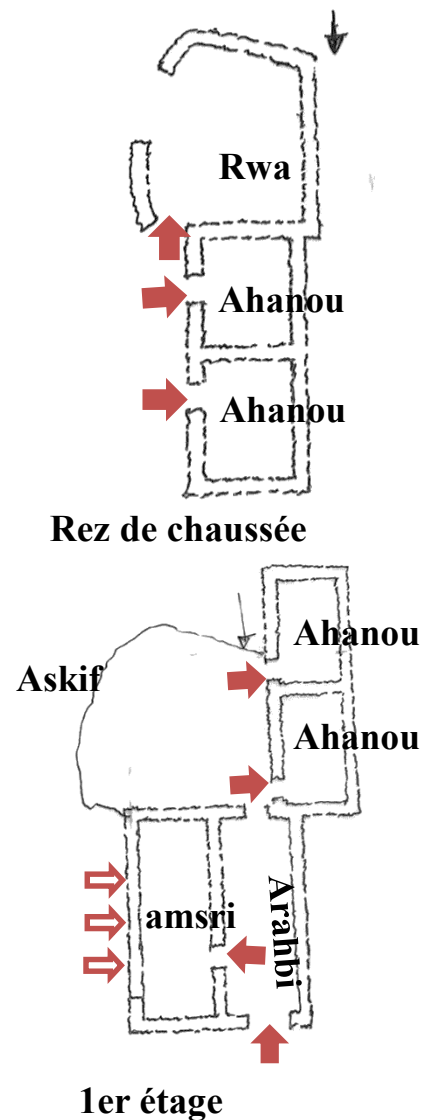
Housing architectural typologies

Dominant Typologies

Houses with one floor



Houses with 2 floors



Rwa (Stable)



Dar Takat (kitchen)



Ahanou room



Arahbi (hall)



Ahanou room



Askif Roof top

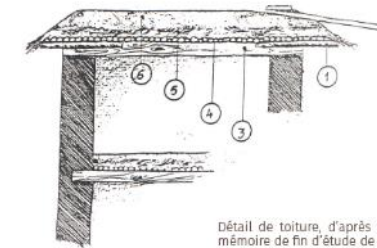
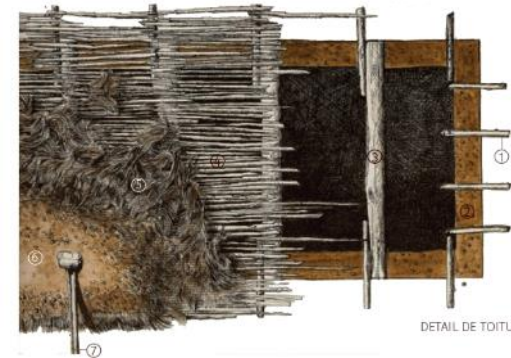
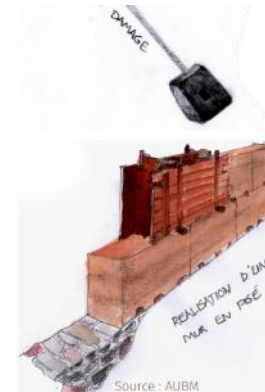


Architecture

Organisation & Morphologie



construction system: walls and roofs



- ① Rondins supportant l'avent qui protège le mur
- ② Mur porteur
- ③ Poutre principale
- ④ Poutrelles de laurier
- ⑤ Armoise : membrane de séparation
- ⑥ Terre damée
- ⑦ Gargouille d'évacuation

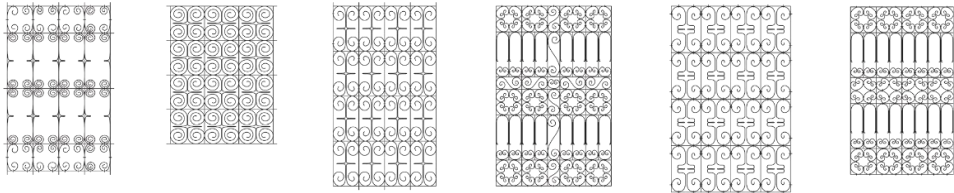
Détail de toiture, d'après «L'habitat dans la vallée des Ait Bouguemez», mémoire de fin d'étude de M. Ameziane et Y. Benjilali. ENA 1990.

Wall materials/colors/textures



Architectural details & specificities

Opening details



Window examples



doors



locks



Ornamentation





Multidimensional Vulnerability of Izlloulen: A Contextual Framework for Architectural Resilience

The village of Izlloulen presents, in addition to its cultural and local rich culture and architectural potential, a layered and site-specific profile of vulnerability shaped by geophysical, architectural, socio-economic, and institutional factors.

Situated in the seismically active High Atlas region, the village's exposure to natural hazards is compounded by structural fragility, infrastructural marginality, and socio-cultural dynamics that together render it highly susceptible to both acute shocks—such as earthquakes—and chronic stressors, including rural depopulation, climate variability, and economic precarity.





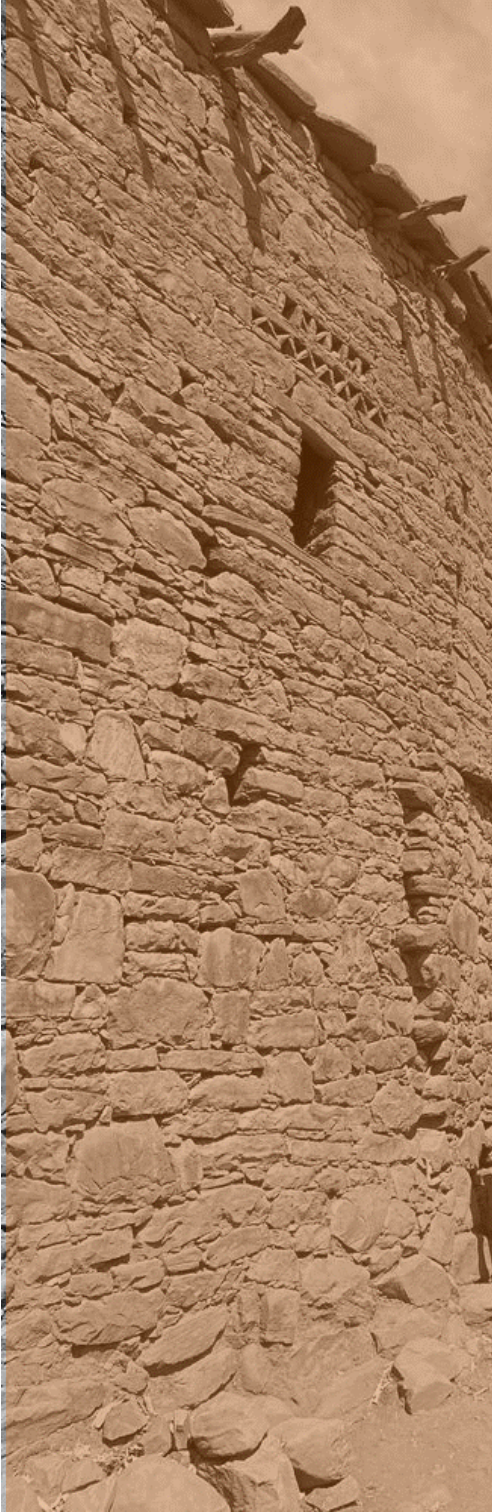
Impact of the 2023 earth quick on the Village

The Mw 6.8 earthquake that struck Morocco on September 8, 2023, with its epicenter located in the High Atlas Mountains near the Al-Haouz region, had widespread consequences across multiple provinces, including Azilal, where the village of Izlloulen is situated.

While the epicentral zone experienced catastrophic destruction, secondary impact zones—such as Izlloulen—were nonetheless significantly affected due to the region's vulnerability factors: traditional earthen and stone construction, steep terrain, and limited seismic resilience in rural infrastructure.

Architectural Impact

As the built environment of Izlloulen is predominantly characterized by vernacular Berber architecture, consisting of dry stone masonry, rammed earth (tabia) walls, and timber or flat earthen roofs, these traditional structures, while well-adapted to local climatic conditions, are particularly susceptible to lateral ground motion and seismic shear forces due to their heavy mass, unreinforced construction, and lack of structural integration between vertical and horizontal elements.



As a result, the earthquake caused partial or total collapse of multiple residential buildings, particularly older homes with degraded materials. It also caused cracking and detachment of walls and roofing elements in structures that remained standing, compromising their safety and habitability. Additionally, it produced damage to communal spaces, including granaries, small mosques, and irrigation channels, all of which play vital roles in the social and economic fabric of the village.

In some cases, retrofits or additions made with incompatible materials (e.g., cement blocks or corrugated metal) exacerbated structural weaknesses, rather than improving safety.

Social and Cultural Impacts

Beyond physical damage, the earthquake profoundly disrupted the sociocultural dynamics of Izlloulen. As in many rural Moroccan communities, domestic architecture is not merely shelter but a locus of intergenerational life, social cohesion, and ritual activity. The destruction of homes led to: Temporary displacement of families, forcing relocations to makeshift shelters or the homes of relatives in neighboring hamlets.

Erosion of traditional communal support systems, as physical gathering spaces (e.g., village squares, shared ovens, and prayer areas) were damaged or rendered inaccessible.

Psychosocial stress, particularly among the elderly and women, for whom the domestic space is a primary domain of identity and cultural transmission.

The event may trigger increased out-migration, especially among younger residents, accelerating a pre-existing trend of rural depopulation and weakening the demographic resilience of the village.



Resilience and Reconstruction Challenges:

The post-earthquake period has highlighted both the adaptive capacity and the fragilities of Izlloulén. Local knowledge systems, such as traditional construction techniques and communal rebuilding practices (*taiiach*), offer a foundation for culturally embedded reconstruction. However, they face significant obstacles:

Scarce financial resources for material procurement and skilled labor.

Limited technical guidance on seismically safe construction adapted to vernacular forms.

Tensions between tradition and modernization, as reconstruction efforts increasingly involve external NGOs and state actors usually promoting cement-based or modular solutions that may not align with local ecological and cultural contexts.

The situation underscores the urgent need for integrated reconstruction strategies that combine engineering science, anthropological insight, and community participation, ensuring that resilience is not only structural but also cultural and social.



Relevance for the Competition and Issues to be addressed

Izlloulen offers a compelling case study for building resilience within sustainable rural development, context-sensitive architecture, and cultural preservation. The site presents unique design challenges: remote access, sensitive topography, limited resources, and the need to respect local traditions while introducing resilient and climate-appropriate innovations.

Participants are encouraged to engage specifically with:

- Local geomorphology and natural risk factors (seismic activity, erosion)
- Traditional Berber architecture, building typologies and spatial layouts
- Water scarcity and self-sufficient agricultural systems
- Cultural continuity and economic enhancement (in relation to the local community)



Relevance for the Competition and Issues to be addressed

Participants are invited to engage with Izelloulen not solely as a site for architectural intervention, but as a living, complex system whose resilience depends on the interplay between its built environment, its community, and its surrounding landscape. Proposals should recognize the village's dual reality: its vulnerability, marked by isolation, limited infrastructure, climate challenges, and economic fragility; and its potential, rooted in its cultural heritage, traditional knowledge, natural landscapes, and communal way of life.

The competition seeks visions that transcend purely architectural solutions. Submissions must present a comprehensive strategy that integrates the spatial, social, economic, and geographical dimensions of the village. Architectural components—whether housing, communal facilities, or landscape interventions—should be conceived as catalysts for broader development, enhancing the quality of life while preserving Izelloulen's identity and ecological balance.

Proposals should therefore explore ways to:

Strengthen **social cohesion**

Support and diversify the **local economy**, including agriculture, crafts, and small-scale tourism, in ways that build long-term sustainability.

Address the **geographical and climatic context**, by designing solutions that work with the natural terrain and climate rather than against them.

Foster **cultural and environmental resilience**, ensuring that interventions respect the vernacular character of the village while introducing adaptive, forward-looking innovations.

Ultimately, the objective is to craft a communal project that positions architecture as one tool among many in a broader framework of resilience—where the built environment, local livelihoods, social structures, and natural systems work together to secure Izelloulen's future and enhance its resilience.