



Fig.3 and fig.4 Grazing animals in the New Gournia fields A shaded New Gournia Streetscape (credits: World Monuments Fund/Community Consortium, 2010)

to greater Luxor have given rise to a community with a strong sense of and attachment to their environment. This attachment to place is codified by residents who do care about building fabric and frequently extend limited family resources to make repairs and renovations.

As the primary stewards of New Gournia, residents are critical stakeholders in the conservation process. Living and working in the historic landscape, they are the linchpin to preserving the core values of New Gournia, which extend far beyond design and fabric. That the village remains a vibrant, closely knit community is testament to the endurance of Fathy's ideals. He gave dimension to notions of urban intimacy, access to education, and community engagement, all of which were codified in his innovative, mixed-use plan. These elements remain as cornerstones of New Gournia's physical and social foundation, and likewise can serve as tools for forging common ground amongst the varied interests engaged in planning for its future.

The institutions involved in safeguarding the village must balance these sometimes conflicting values regarding the significance and conservation of New Gournia, but they have a tremendous resource and precedent in the community. The Fathy legacy is as much about participatory design as it is about the forms resulting from it. Capitalizing on this history by engaging the community in cooperative planning would tap a critical resource. It would enable a sharing of knowledge and inform a more robust program of revitalization, one that serves community needs, as well as heritage interests.

A fundamental first step in safeguarding New Gournia and engaging its residents is the establishment of a structured vehicle for community participation. Open, public meetings involving government officials and others engaged in conservation efforts will be a critical element, providing a regular forum for gathering

Notes

(1) A downloadable PDF of the assessment report can be found at: <http://www.wmf.org/dig-deeper/publication/new-gournia-village-conservation-and-community>. An associated film can also be found at: <http://www.wmf.org/video/hassan-fathys-new-gournia-past-present-future>.

References

Fathy, H. (1973). *Architecture for the Poor: An Experiment in Rural Egypt*. Chicago, USA: University of Chicago Press.
Haney, G., Allen, J., Avrami, E., & Raynolds, W. (2011). *New Gournia: Conservation and Community*. New York, USA: World Monuments Fund.

and sharing information. Such communication will dispel the rumors that prompt anxiety and mistrust on the part of local residents, whose ties to Old Gournia stir up a history fraught with displacement and relocation. Ultimately, a structured vehicle for participatory planning will build mutual respect and trust amongst the various stakeholders and entities involved in the project.

6. CONCLUSION

As noted above, in the eyes of some conservation professionals, the New Gournia community has destroyed Fathy's masterpiece through modifications and new construction. However, this assessment found a great deal of respect for the history and heritage of New Gournia among residents. Given the evolving social dynamics and the problems caused by changing environmental conditions, their actions are borne out of necessity. They are taken with the best of intentions, and with limited financial and information resources. Their stewardship of New Gournia should not be judged by the loss of original fabric, but rather through their perpetuation of Fathy's principles of community empowerment and sustainability.

While many individual Fathy buildings have been replaced and renovated, the findings of this assessment support the idea that the cultural landscape of New Gournia today is very much a product of Hassan Fathy. In this respect, the value of this place and of Fathy's legacy is not simply that of mud brick and plaster. It is not even that of domed dwellings and open loggias. However, it is that of the place-based social fabric that serves to knit together this community. The unifying, somewhat intangible, elements of this plan concern education, religion, and economy all of which remain intact in New Gournia.

Thus, conservation of the built environment of New Gournia should be a community-driven process that integrates issues of environmental, economic, and social sustainability – from improved housing to agricultural land use to tourism management – into a balanced set of actions. Effectively integrating heritage protection into a broader program of infrastructure and service improvements, education, and development will forge a strong foundation for sustainable preservation of Fathy's legacy and improved quality of life within the village.

CULTURAL LANDSCAPE OF THE DRÂA VALLEY, MOROCCO

Saverio Mecca, Eliana Baglioni, Letizia Dipasquale, Khalid Rkha Chaham

Theme 4: Conservation and Development of Human Settlements and Cultural Landscapes

Keywords: Earthen Architecture, Drâa Valley, Moroccan Cultural Heritage.

Abstract

The six Drâa Valley oases are a system of several rural villages called ksour, characterized by a profound balance between agronomic, economic, social, architectural, ecological, and cultural dimensions. The Drâa valley oases are an exemplar of secular sustainable living systems and contain also a diversity of ethnic groups that defines the rich socio-cultural diversity of the area. Sophisticated irrigation systems, ruled by traditional local resource-management institutions to ensure a fair water distribution, integrated with significant earthen architecture, constitute a complex and important, both material and immaterial, cultural heritage.

Local building technologies use raw earth as the main material; earth, due to its easy availability and its low cost, constitutes a precious resource in the building of construction elements, from the structural to the decorative. The predominantly earthen-building techniques, used simultaneously and symbiotically in the different architectural elements, are rammed-earth and adobe.

In the Drâa Valley the cultural heritage represents an undeniable value and an excellent and competitive resource for quality, distribution, levels of preservation and permanence in today's cultural and socio-economic structures – thus, it is a decisive element in the process of local development.

Effective projects toward local development and cultural heritage conservation and innovation, in conjunction with the objective to improve living conditions of local populations, should therefore be founded on these general actions:

- Identification and systemic understanding of local, traditional and sustainable knowledge by all actors and especially by local populations;
- Integration of cultural heritage with the processes of local development, in particular adapting the traditional houses into new cultural and living needs, to end the general abandonment of housing and the loss of this important heritage;
- Construction of government and management systems in which the local actors know how to have dialogue and organize the real course of development, in an autonomous way, improving the specificities of identity that characterize the place.

1. INTRODUCTION

Situated in the southeast of Morocco and located in a relatively isolated and distant position in relation to the principal city centers of the country, the Drâa Valley stands out for its rich historical and cultural heritage. The six oases of the Drâa Valley are a relevant and unique environmental and social system developed by man in a constraining and harsh environment. They display a complex, diversified and intense relationship between man and nature, which has been developed over millennia. Sophisticated irrigation systems, managed by traditional local governance institutions, not only ensure a fair water distribution, but also constitute a crucial element of the oasis agricultural and social systems (Badia, Cusidó, Luria, and Noy, 1998).

These ancient socioeconomic systems based on the date palm, experimented through more than 2,000 years, produce an urban network of ksour (villages) and an important architectural

heritage, strongly integrated with palm trees, base of the pre-desert oasis ecosystem. The earthen architectures and the palm trees are strictly related to the harsh, dry and hot climate, offering shade and lowering the ambient temperature, making it possible to live in the pre-Sahara landscape in a sustainable and low-energy manner, creating a surprising place of recreation (Mecca and Biondi, 2005; Mecca, Tonietti, and Rovero, 2007).

Traditional water resource management systems, transhumance practices, traditional earthen-architectural design of human habitats and social cohesion among local people and tribes are relevant examples of local knowledge, of sustainable and low-energy strategies for human settlements in desert regions. Since 2,000, The Drâa Valley Oases has belonged to the UNESCO Man and Biosphere Reserve, called “*Réserve de biosphère des oasis du sud Marocain*”. The Museum Project



Fig.1 Tamnougault Ksar (credits: Eliana Baglioni, 2009)

would serve particularly in the Zagora area to promote the conservation and enhancement of the rich and invaluable cultural heritage created by Drâa Valley communities.

The future of the communities living in the Drâa Valley is not only related to conservation of biodiversity, but mostly to conservation and innovation of indigenous knowledge and cultural aspects related to social systems, which produced and improved biodiversity. The development of projects (and tourism can play a part) that are able to create effective value-added actions generate income for all sectors of the Drâa Valley society. This is possible based on a holistic approach, able to conserve biodiversity, as a result of cultural practices, and based on a complete understanding by stakeholder groups of its socioeconomic values.

2. DRÂA VALLEY RESOURCES

2.1 Natural and cultural biodiversity

The Drâa Valley is a long oasis that goes south from Ouarzazate city into the Sahara Desert. The valley is the middle part of the Drâa River, which is the largest in Morocco. The river begins on the Saharan side of the High Atlas Mountains, creating a wide valley at the base of the Anti Atlas, entering the Sahara Desert, and finally flowing into the Atlantic Ocean.

The Drâa is characterized by an irregular water flow – from which it derives its name Oued Drâa, so it is only during periods

of prolonged heavy rainstorms that the water reaches the Atlantic; this happens only occasionally; therefore, the southern and western channel leading to the sea seldom sees water.

The Drâa Valley features a rich forest of palm trees, inserted in a very arid and rocky landscape, and fertile earth; this area was chosen, already in antiquity, for human settlements and supported ancient agricultural communities. From the 9th to 15th century, the Drâa Valley was one of the most important caravan routes between Europe and Timbuktu. The goods transported were ivory, gold and slaves. The last caravan of slaves is said to have crossed the Sahara in the 1950s.

The biodiversity of the Drâa Valley oases is characterized not only by a rich range of wild and cultivated plant and animal species, but also by a millenarian civilization that preserves its knowledge in concordance with current sustainable development norms. Traditional management systems of local resources are directly correlated to social and cultural structures that are based on solidarity in the elaboration of common infrastructures, such as those for mobilizing water resources. Oasis-production systems have allowed, therefore, to local populations to live in such an extremely fragile natural environment.

2.2 Human biodiversity of the Drâa Valley oases

The Berber population, native to all northern Africa, was present in the Drâa valley already in the Neolithic period (6000-2000 BCE), as established by petroglyphs in the Atlas Mountains and in the Jbel Bani Mountain, which border the Drâa Valley to the east. The petroglyphs represent hunting and herding scenes, activities present also today.

Arabization began in 1150 CE with the arrival of some Maâquil tribes, Tunisian Bedouins, but the Berber language persists today, in speech only, and is the mother tongue for most of the population, particularly in southern Morocco. The actual society is composite and embodies different social groups, born in the past century but still very distinct and hierarchical both from the social and the urban organization point of view (Taoufik Zainabi, 2004).

The Chorfa, and the Mrabidine are the religious families that, diffusing the Koranic laws, have many land properties and have the role of conflict mediator in the village. The Imazighen (in Arabic) o Hrar (in Berber), descending from the nomadic Berber tribe that protected the village, are engaged in breeding and commerce. The Haratine (in Arabic), Ahardan (in Berber), also called Draoua, are composed both of a native sedentary population of the valley and the Sudanese slaves imported during the caravan commerce. These classes are at the service of the others, as servants in homes or laborers in the fields. The presence of Arabs is dated from the 6th century CE, after the Arab conquests. Finally, there persist some Jewish communities, some of the most ancient inhabitants of the territory, living peacefully but separately from Muslims.

These populations contributed to the development of the history and culture of the region, and gave rise to the production of this cultural heritage, distinguished by a mixture of languages and religions.

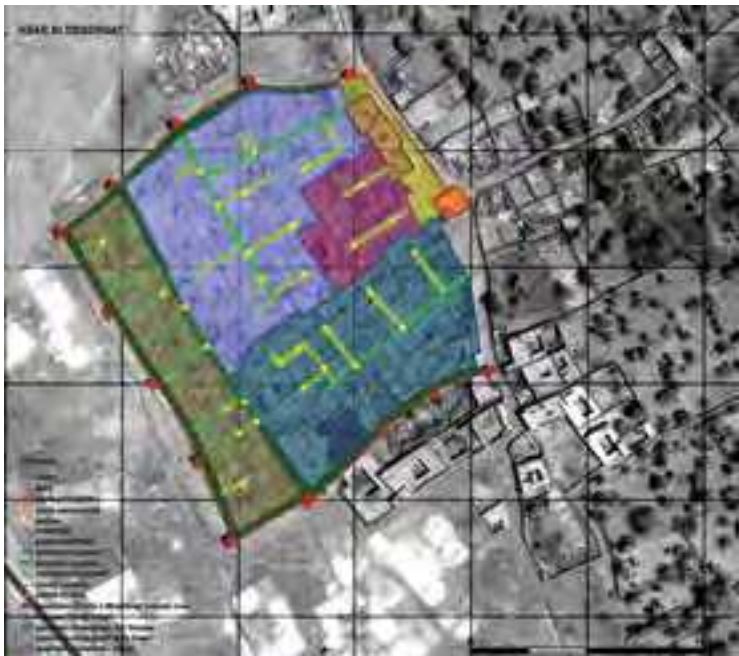


Fig.2 The Tissergat Ksar case study (2) (credits: Eliana Baglioni, 2009)

2.3 Local knowledge systems of land and water-resource management

The agricultural system is based on the palm tree that needs little water for its growth and sustenance but, on the contrary, creates shade and humidity beneath, generating a micro-climate and permitting three production levels: the date palms at the highest level, fruit arboriculture at the middle, and annual/pluri-annual crops, with a wide variety of vegetables, cereals and forages, medicinal and aromatic plants. Management practices and agricultural techniques reflect the remarkable skills of local populations at using biodiversity in a sustainable way so as to ensure the continued economic productivity of these ecosystems (Chetto, 2003; Zirari, 2003).

Due to low river water levels, the population also became increasingly sophisticated and efficient with systems of water sourcing: the seguia, the tabia, and the khattara (Baglioni, 2009, pp. 6-7). The most common irrigation system in the valley is the seguia that consists of branched channels conveying the river water to the fields by small dams built with stones, mud and branches. Because the fields to be irrigated have a higher altitude than the river, the seguia must begin very much upstream and be built with a diagonal path (in relation to the river axis), to allow gravitational water flow. These channels extend from 1 to 10 km and need considerable maintenance; the water distribution is controlled and regulated by the ammazal, which open and rebuild the small dams to distribute the water according to the nouba.

Another system, used in the most peripheral territory of the valley, is the tabia, an interception and collection basin of runoff water coming from the neighboring mountain slopes. Tabia are made of earth and stone and have an average size of 100 m by 30 m.



Fig.3 Kasbah Dâr El Hiba in the Tissergat Ksar (credits: Eliana Baglioni, 2009)

The third system, used extensively throughout the Arab world, is the khattara. This is a complex system that permits the transporting of groundwater to the village by gravity. This system is composed of several elements: a mother well upstream, which captures the groundwater, and a horizontal underground tunnel, which carries the water to a collection basin. From these basins, the branched channels for field irrigation leave. The path of the khattara features numerous wells, necessary for the construction and inspection of the underground tunnel. This system is very susceptible to the changes of groundwater level, and is therefore in continuous evolution.

Water use in the Drâa Valley is social and communal, and water rights are proportional to individual, family, or village participation in the construction and maintenance of the water-sourcing systems, as indicate by the nouba.

Human interactions in the oases ecosystems were enabled to provide ecological and socioeconomic services to meet the needs of the local populations. The Drâa Valley oases are, therefore, havens of agricultural biodiversity: during centuries of experimentations, autochthonous and cultivated plants have been carefully selected from natural or artificial ecosystems for life in this challenging environment.

3. ARCHITECTURAL AND BUILDING KNOWLEDGE HERITAGE

3.1 Urban Morphology and Building Techniques of Drâa Valley Settlements

The Drâa Valley region has one of the greatest earthen-architectural heritage in the country and in the world. Along the valley, in fact, exist over 300 Berber villages, ksar, constructed

entirely with raw earth. These rural and fortified villages are characteristic of the Drâa and Dadès valleys, and date from the 15th-century period when the sedentary Berber population found it necessary to enclose villages with high walls and defensive towers, caused by continuous attacks from nomadic Berber tribes.

The ksar (sing. ksar) have a very dense urban fabric, with houses built one against the other in mutual protection from the heat. In addition, the first floor is often constructed on a bridge over the road, thus creating a grid of cool, dark tunnels below which protect inhabitants from heat and sand storms (Baglioni, 2009, pp. 22-34). It is interesting to see how this type of aggregation simulates underground architecture, enjoying the advantage of thermal insulation and, at the same time, solving the major problem of ventilation (Bourgeois, 1988, p. 48).

The ksar are usually on the edge of palm forests, in order to avoid taking up agricultural land, which is the main source of livelihood; the palm forests, in fact, are crossed by labyrinthine paths between the different properties, limited by rammed-earth walls. The village has a very strict urban division into public and private spaces, and for different social classes.

In addition to ksar, Kasbah are spread across the valley, big fortified houses belonging to Berber families who protected the villages and adjacent territories, or, later, belonging to the representatives of Pasha Glaoui, who exercised administrative control until Moroccan independence.

Both in the kasbah and the ksar, the housing type used is constant and recognizable as a patio house. This type, with its specific and various models, has spread throughout the Arab world and the Mediterranean, and is identified with the center of home and family life.

In a Drâa Valley building, the patio is not just a vertical hole in the building, but defined by a perimeter gallery present at all floors, which creates a trading plan between the central vacuum and the private rooms; the patio size and shape are determined partly by local building techniques and climate and partly by local traditional culture. The importance of this space in housing composition is also expressed in the architectural details and decorations are very rich compared to other walls where there are no specific details (Baglioni, 2009, pp. 38-43 and 51-55).

The heritage represented by these urban settlements constitutes evidence of the existence of technical knowledge, competence and skills accumulated during thousands of years of practical and local experience. In the traditional building technique of the Drâa Valley, the earthen material used plays a major role: it is utilized for walls, floors, roofs, mortar and plaster. Earth is used for its versatility in many various situations, for its easy availability and low cost, but it also proves an effective response to the warm, dry climate of the place. The masonry techniques utilized are rammed-earth, called alleuh, and adobe, called toub, used separately in different parts of the building (Baglioni, Mecca, Rovero, and Tonietti, 2010).

Besides earth, palm wood is used for horizontal



Fig.4 Rammed-earth masonry construction in the Drâa Valley (credits: Saverio Mecca, 2007)

structures, and canes are used for floors and roofs. It was also observed the limited use of stonework, mainly for the construction of foundations.

3.2 Climatic Interaction and Energy Efficiency in Drâa Valley Architecture

The ksar is a paradigm of the climatic adaptation of architecture. Drâa Valley buildings follow some basic principles (Baglioni, 2009, pp. 48-49):

- Building technology: raw earth as construction material, besides being abundantly available in these places, is able to achieve high levels of thermal mass, especially if associated with considerable wall thicknesses;
- External walls: due to the very dense urban construction, there are very few surfaces exposed to the sun (practically limited to the roof terrace), limiting heat exchange;
- External windows: the houses have very small openings on the outside, in order to protect from heat and dust, but also due to the culture of privacy;
- Patio: it plays the double function of light shaft, limiting the direct exposure of the ground floor, and ventilation, which like a chimney pulls the warm air up and contributes to the cooling of the rooms;
- Use of space: nomadic culture is practiced even inside

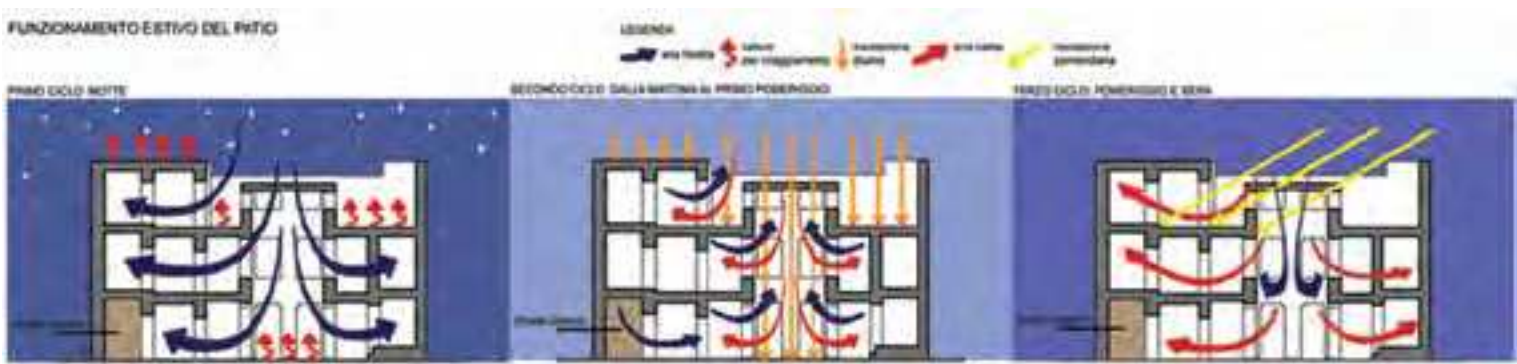


Fig.5 Summer bioclimatic operating of Drâa Valley patios (credits: Eliana Baglioni, 2009)

the house, so that the housing spaces have a low definition of use for different living parts, according to outside temperatures. This practice involves sleeping on the terrace in the summer and living on the lower floors of the house during winter.

3.3 Weaknesses and critical points

The cultural heritage and the highly sustainable living systems of the Drâa Valley oases are exposed to many threats under the effects of different aggressive environmental factors that can be either biological, physical or human: Bayoud palm disease, locust invasions, water and soil salinity, soil erosion and degradation, periods of drought and diverse forms of desertification, loss of traditional knowledge, poverty, seasonal and definitive migration, modern urban extension and related activities, the use of the most recent building technologies, and architectural and urban low-energy consumption schemes. All of these factors affect the delicate sustainability equilibrium of the oases.

4. CONCLUSION

If it is assumed that cultural heritage as the strategic factor of socioeconomic development, development plans have to be oriented to empower local resources and productive systems (agriculture, urban and architectural construction, craftsmanship, and tourism activities), according to three general actions:

- Identification and systemic understanding of local and traditional knowledge and site environment by local populations;
- Integration of management and improvement processes for cultural-heritage valorization with development processes integrating the local communities;
- Implementation of government and management systems in which the local actors know how to organize the real course of development, in a controlled but autonomous way, to improve the specificities of identity that characterize the region.

Based on these principles, it can be enumerated the fundamental parameters for the planning and control of the effectiveness and sustainability of maintenance and improvement projects in the relevant 'cultural landscape' of the

Drâa Valley: environmental-systemic knowledge of site, local and traditional knowledge and living heritage, governance, sharing, and partnership.

4.1 Environmental-systemic knowledge of the site

This can be obtain only through the elaboration of multi-disciplinary researches, according to a systematic approach on natural, social, juridical and human environment, and on the needs and expectations of people living in the Drâa Valley. Not only is it essential to know the site and its environment, for an understanding of its dynamic, to underline strong points and criticisms or weaknesses, to discuss and to establish priority and objectives before any decision or project of improvement, but the quality of the local population's systemic knowledge of the site's environment can also constitute a basic condition in planning and management of development processes.

4.2 Local and traditional knowledge and living heritage

The cultural heritage of this region is not only material, but also immaterial traditional knowledge and it needs an integrated approach (social, cultural, economic) based on the accurate management of local resources, and the recovery and the correct recognition of production traditions (architecture, agriculture, resources, etc). Only an exemplary process is able to oppose environmental and urban degradation: improvement and maintenance must be united in a continuous process of revitalizing local identity, its heritage, its scientific and technical knowledge, and its individualities.

4.3 Governance

The choices made in regards to a site have to be shared with the local communities that must assume the responsibility of planning and management, becoming themselves protagonists of such a development, and assuring continuity and sustainability over time. The ability to govern the process needs a recognized and legitimate local political and technical organization to

animate, plan, accompany, appraise, and communicate the future territorial dynamics: this means the growth of local technical competences to help local autonomy versus central authority, and transparent processes of development in the relationship among institutions, and between rulers and those governed.

4.4 Participation

This determines the involvement of local populations in the elaboration of politics, and the recovery of community power towards active expression. Participation in the sharing of knowledge, choices and actions, implies a form of balance among the different subjects, a redistribution of power compared to an initial configuration in which there are ‘strong’ and ‘weak’ interests, and suggests the necessity of complementary processes: the top-down approach in which a strong actor, the public sector, typically represents the local community, or the bottom-up approach in which the same community promotes the involvement and development of the territory with which it is identified.

.....

Notes

(1) INN-LINK-S: Research Center on Innovation and Local and Indigenous Knowledge Systems.
(2) Caption of the Fig. 2. In red color, the defensive walls and tower. In orange color, the only original door access. The orange arrows indicated the door opened in the '70 of the 20th century. In dark green color, the main streets along the defensive walls. In light green color, the streets and the alleys (derb) for access to the houses, with shafts of light indicated with yellow dots. In pink color, the Chorfa and Mrabitine district. In blue color, the Imazighen districts, descendants of two different tribes, and the Kasbah (at the bottom). In grey color, the Harratine district, probably added in a second time.

.....

References

Badia, F., Cusidó, J., Luria, M., & Noy, J. (1998). Marruecos Presahariano, Habitat y patrimonio. Barcelona, Spain: Col·legi d'Apparelladors - Arquitectes de Barcelona.

Baglioni, E. (2009). Tecniche costruttive in terra cruda nella Valle del Drâa, Marocco, unpublished graduation thesis. Florence, Italy: Faculty of Architecture, Florence University.

Baglioni, E., Mecca, S., Rovero, L., & Tonietti, U. (2010). Traditional building techniques of the Draa Valley Marocco. In Terra em Seminário 2010. 6º Seminário Arquitectura de Terra em Portugal, 9º Seminário Ibero-Americano de Arquitectura e Construção com Terra. Coimbra, Portugal: Argumentum.

Bourgeois, L. (1988). Communal cooling: simulating the underground in a southern Moroccan town. Environmental Design: Journal of the Islamic Environmental Design Research Centre. Vol. 1-2: 48-51. Retrieved from ArchNet: Islamic Architecture Community database.

Chetto, A. (2003). Analyse technico-socio-économique de la diversité génétique du palmier dattier dans les palmeraies de Aoufous et Fezouata. Rapport du projet PNUD-FEM, RAB98/G31. Morocco: IPGRI et INRA.

Mecca, S. & Biondi, B. (Eds) (2005), Architectural Heritage and Sustainable Development of Small and Medium Cities in South Mediterranean Regions, Proceedings of the First International Research Seminar. Forum UNESCO – University and Heritage, Florence, 27th-28th May 2004. Pisa, Italy: Edizioni ETS.

Mecca, S., Tonietti, U., & Rovero, L. (2007). Connaissances en construction et diversité culturelle de l'Architecture en terre à Tamnougalt (Zagora, Maroc). In RIPAM proceedings. Marrakech, Morocco: Université Cadi-Ayyad.

Taoufik Zainabi, A. (ed.) (2004). Trésors et merveilles de la Vallée du Drâa. Ouvrage soutenu par l'UNESCO dans le cadre du programme. Rabat, Morocco: Editions Marsam.

Zirari, A. (2003). Projet Gestion participative des ressources génétiques du palmier dattier dans les oasis du Maghre. Colloque National sur le Palmier Dattier. Erfoud.

4.5 Partnership

The construction of a network and channels of communication for explicit and tacit knowledge is necessary to facilitate the identification of common cultural, political and economic interests. An improved strategy for cultural landscapes as an economic resource is founded on systemic environmental knowledge of site, local and traditional knowledge and living heritage, governance, participation, and partnership and demands a key role of research:

- To sustain training strategies, adapted to different Drâa Valley communities;
- To sustain the building capacity of technical operators of communities;
- To facilitate the communication among rulers and those governed;
- To supply scientific knowledge in the sector of integrated appropriate technologies with local and tacit knowledge;
- To contribute to the experimentation of strategies and technologies in accordance with local communities.

EARTHEN ARCHITECTURE IN PUNA DE ATACAMA, ARGENTINA: LOCAL KNOWLEDGE AND PRACTICES

Jorge Tomasi

Theme 5: Local and Regional Knowledge, Intangible Heritage and Social Impact
Keywords: Puna de Atacama, local knowledge, construction rituals

.....

Abstract

Earthen building techniques form a corpus of relevant technical and social knowledge that has not always been nor is duly recognized. A significant issue about these techniques is that they assume, in Latin America, a remarkable diversity in both names and specific procedures. This great variability, which often acts as an identifying brand differentiating between different societies, arises from the recognition of needs and possibilities, as well as the particular historical trajectories of these societies. Diversity of local knowledge is then established as a value of earthen building, which must be recognized and sustained.

In this paper, the characteristics of earthen building techniques used in the area of Susques, in Puna de Atacama, province of Jujuy (Argentina) will be analyzed. These techniques will be understood and described within an integrated construction system that ranges from stone and earthen foundation, the use of adobe, and even roofing, made of earth and guaya (straw). The particularities of each of these techniques, as well as their interrelation, will be discussed. The transformations that have occurred to procedures and materials in recent years will be considered as well. The starting point will be the understanding of the act of building, which is not only embedded for technical reasons, but fundamentally is a social fact that interlocks with other dimensions of people's life within a society. Also in this regard, the sociability that comes into play in the construction practice of Susques is considered. The material presented in the text comes from continuous ethnographic fieldwork in Susques since 2003.

.....

1. INTRODUCTION

In recent decades, and especially since 1970, researchers from different backgrounds became interested in the vast field of earthen construction. While historical stigmas have not yet ceased, the different techniques that have been part of the knowledge corpus of many societies in different places and times began to be incorporated into academic agendas. The same has occurred throughout Latin America, where the dense and varied traditions in the use of raw earthen materials that characterizes our countries, has been recorded. In fact, certain collective efforts were explicitly used to account for the variability in Latin America with respect the earthen building, and thus promoting, in turn, the dialogue between researchers from different countries (e.g. Viñuales, 1994).

The Andean highlands have particularly benefitted from analysis, both by the diversity of the techniques involved, and by the amount of time that has been devoted to recording earthen architecture usage and important symbolic connotations. In Argentina, from the first decades of the 20th century, and especially since 1970, important workings allowed visualizing earthen building techniques from historic

(Asencio, et al., 1974), geographic (Ardissone, 1937) or from a more technological standpoint (IIV, 1972), focusing specifically on an area known as Puna. From different fields of study, in recent decades, various researchers have addressed this area's architecture, making significant contributions (Rotondaro, 1988; 1991; Delfino, 2001; Göbel, 2002; Pujal, Marinsalda, Nicolini, and Demargassi, 2002; Ramos, Nicolini, Demargassi, and Marinsalda, 2004). This paper will focus on the Susques area (Jujuy province, Argentina) with the objective of recognizing the local reasons for using earth as a building material.

It is interesting to note that, as in many other places, earthen architecture in Puna was historically reviled and minimized, associating it with poverty, backwardness, lack of hygiene or structural instability. From authorities, there were even raised specific policies to eradicate it. In this context, the Puno local communities held onto their traditions and construction practices, long before architects, engineers and other professionals looked into these issues. In fact, the use of earth has had a remarkable persistence and vitality in these places, further demonstrating its ability to transform itself into