

Vernacular Architecture and Cultural Identity in Shrinking Rural Settlements

Vidal Gómez Martínez ¹ | Geng Ma ² | Paola Pellegrini ³ | Miguel Reimão Costa ⁴

Received: 2022-04-21 | Final version: 2022-07-14

Abstract

The depopulation and abandonment of rural areas is a phenomenon that is repeated on a global scale and is transversal to most territories and cultures. This shrinking process particularly affects vernacular architecture, due to its modest materiality and therefore the cultural values that reside in it, both of a material and immaterial nature. This work analyses the situation of rural vernacular architecture in shrinking areas in three regions of different scales and cultural approaches as the southern areas of China, Morocco and Spain, taking as reference typological elements specific to each region. The research delves into experiences in which the endangered cultural heritage is transformed into a dynamizing force for the territory on which it is based and opens the door to different solutions both for the conservation and valorisation of its own elements and for the resolution of the underlying socio-cultural problems. The research identifies generic and universal aspects of the shrinking process, as well as specific conditions of each of the various study territories. The work found how the cases taken into consideration share some conditions in dealing with the consequences of the shrinkage, such as adaptation difficulties, administrative distance, heritage fragility.

Keywords: Shrinking; rural settlement; vernacular architecture; conservation; valorisation

Citation

Gómez Martínez, V. et al. (2022). Vernacular Architecture and Cultural Identity in Shrinking Rural Settlements. *ACE: Architecture, City and Environment*, 17(50), 11389. <https://dx.doi.org/10.5821/ace.17.50.11389>

Arquitectura vernácula e identidad cultural en asentamientos rurales en declive

Resumen

La despoblación y el abandono de las zonas rurales es un fenómeno que se repite a escala global y de forma transversal a la mayoría de los territorios y culturas. Este proceso de declive afecta especialmente a la arquitectura vernácula, por su modesta materialidad y por tanto los valores culturales que en ella residen, tanto de carácter material como inmaterial. Este trabajo analiza la situación de la arquitectura vernácula rural en zonas en declive en tres regiones de escala y planteamiento cultural tan distintos como las áreas meridionales de China, Marruecos y España, tomando como referencia elementos tipológicos propios de cada región. Profundiza en experiencias en las que el patrimonio cultural en peligro se transforma en fuerza dinamizadora del territorio sobre el que se asienta y abre la puerta a soluciones tanto de conservación y valorización de sus propios elementos como de resolución de los problemas socioculturales de fondo. La investigación identifica aspectos genéricos y universales del proceso de retracción, así como condiciones específicas de cada uno de los diversos territorios de estudio. El trabajo encontró cómo los casos tomados en consideración comparten algunas condiciones en el enfrentamiento de las consecuencias de la contracción, tales como dificultades de adaptación, distancia administrativa, fragilidad patrimonial.

Palabras clave: Despoblación; asentamiento rural; arquitectura vernácula; conservación; valorización

¹ PhD Architect, Universidad de Sevilla (ORCID: [0000-0001-9148-8125](https://orcid.org/0000-0001-9148-8125)), ² PhD candidate at Liverpool University, Dept. of Geography and Planning, (Scopus Author ID 57218705798) ³ Architect, PhD. Associate Professor at the Xi'an Jiaotong - Liverpool University, Dept. of Urban Planning and Design (ORCID: [0000-0002-4102-3431](https://orcid.org/0000-0002-4102-3431); Scopus Author ID: [57200145443](https://orcid.org/57200145443)), ⁴ Architect, PhD. Assistant Professor at the University of Algarve and researcher at CEAACP and CAM, Portugal (ORCID: [0000-0002-9894-7811](https://orcid.org/0000-0002-9894-7811); Scopus Author ID: [57218657952](https://orcid.org/57218657952)). Contact e-mail: vidalgomezmartinez@gmail.com

1. Introduction

The article presents three studies on vernacular architecture impacted by the shrinkage of their rural contexts: in southern Morocco in the second half of the XX century, in western Spain after the Civil War, in southern China in the last 20 years. All three cases deal with conditions of great heritage value with strong cultural identity, and two cases are in the UNESCO World Heritage tentative list. The scale of the vernacular object of the studies varies: from the spaces for the community gathering in Chinese Hu'nan, to the traditional villages in pre-Saharan valleys, to the medium-sized town in western Andalusia. Therefore, the selection of case studies covers very different territorial and cultural conditions, as well as regions with different settlement patterns. With these selection criteria, we intend to identify generic and universal aspects of the shrinking process, as well as specific conditions of each of the various study territories. In the same way, we also intend to identify different intervention strategies, both at the level of heritage safeguarding and at the level of socio-cultural approach.

The research comprises an identical methodology for the three case studies, adopting a qualitative approach to characterize the built heritage, based especially on fieldwork. The gathering of information *in situ* involves different stages: heritage inventorying, selection of study objects and execution of respective surveys and drawings, as well as informal interviews with local communities. The fieldwork is framed by the study of conservation projects and intervention plans concerning the safeguarding of settlements and heritage assets. Juxtaposing the different existing conditions and approaches to revitalization, it is possible to highlight the main topic these cases have in common, population and cultural shrinkage.

Population shrinkage: the migration from a rural to an urban environment, meaning either the abandonment of the original villages and resettlement in industrialized cities or a new model of urbanization that changes the original village's uses and role. The phenomenon has impacted the rural world at different times and in different parts of the world when a process of economic structural transformation happens, especially in its early stages (Grasland *et al.*, 2008; Keats & Wiggins, 2016; Pallagst *et al.*, 2019). The three cases in this paper are evidence of this phenomenon across the world.

Socio - cultural shrinkage: the loss of social and cultural significance of the old settlement and its architectural elements, due to the evolution of the living standards, the forms of production and the practices of the residents. The loss of population combined with the loss of cultural and economic significance defines the marginalization of the settlements and their decay.

This work brings together the authors' research in areas as physically and culturally distant, but in which they recognise the same process of emptying of rural populations that compromises the conservation of a built heritage of great value. In addition to this common trend, it's identified the potential of this heritage to respond to current challenges such as the creation of an attractive cultural fabric for tourism that could serve as a stimulus for areas that no longer offer work to a large majority of the population due to the industrialisation of agriculture, adaptation to the extreme climatic conditions typical of vernacular architecture, the demand for affordable housing for young people or the social integration of the elderly without the need to move them.

The article presents the cases in sequence, explaining first the phenomenon of shrinkage and then the approach to the conservation of the heritage; the article proposes some tentative conclusions.

2. The shrinking rural population in China and the vanishing of the traditional cultural environment; a case of minority heritage in China

The “Dong” (侗族) is one of the ethnic minorities in China, 3.5 million people originally located in the rugged mountainous region across Hu'nan, Guangxi, and Guizhou Provinces in south-west China, respected by the national government as an expression of cultural heritage, both tangible and intangible (Zheng, Sun, 2018; Ministry of Foreign Affairs, 1999). The value of Dong's heritage is recognized also by UNESCO, which since 2009 inscribed the Dong Grand Song in the World Intangible Cultural Heritage of Humanity (UNESCO, 2009), and by the UN Food and Agriculture Organization, which includes in the Globally Important Agricultural Heritage System Dong's mountainous rural system, that grows together rice, fishes, and ducks in terraced paddies (FAO, 2015). UNESCO also nominated 22 Dong villages in the World Heritage tentative list for their Outstanding Universal Value and their landscape of rice terraces, bamboo forests, and tea plantations that are still predominantly intact (UNESCO, 2013).

The areas where Dong's minority lives have not experienced the great economic development and quick process of urbanization as the areas which were allowed to “open up” to private production, trade, and foreign investments by the “Reform and Open Market Policy” (Garnaut *et al.*, 2018). Nevertheless, even if urbanization has only marginally reached these inner areas, very distant from the mega-cities which developed since the '80s, the cultural environment of this ethnic minority is jeopardized by the overall transformation of China: overwhelming standardized modernization has proven to be destructive for the traditional production forms, lifestyle, and family structure (Li, 2019).

The attraction of wealth and modernization has two main reasons in the mountain areas: not industrialized agricultural production is not profitable and new sources of income must be found; especially young people are relocating to join the workforce in urban areas (Gregory & Meng, 2018; UGC, 2018).

Updated demographic data about the Dong community are not available, as the processing of the last Census 2020 is ongoing, but according to the National Statistical Office the rural population in China has drastically dropped in the last decades, from 80% in 1980 to almost 40% in 2018 on the total population, and the population in rural villages dropped by 25% from 2000 to 2020 (National Bureau of Statistics, 2020). The floating population - the massive so-called internal labour migration - has doubled in the last 20 years and reached 241 million people in 2018. Furthermore, in the provinces of the Dong minority the proportion of the urban population is lower than the average in China: Guizhou 47.52%; Guangxi 50.22%; Hunan: 56.02%. The rural-urban migration must be considered together with a contemporary phenomenon that is changing the Chinese society, i.e., the total population is quickly aging: in 1982 only 4.9% was above 65 years, in 2018 is almost 12% (National Bureau of Statistics, 2020).

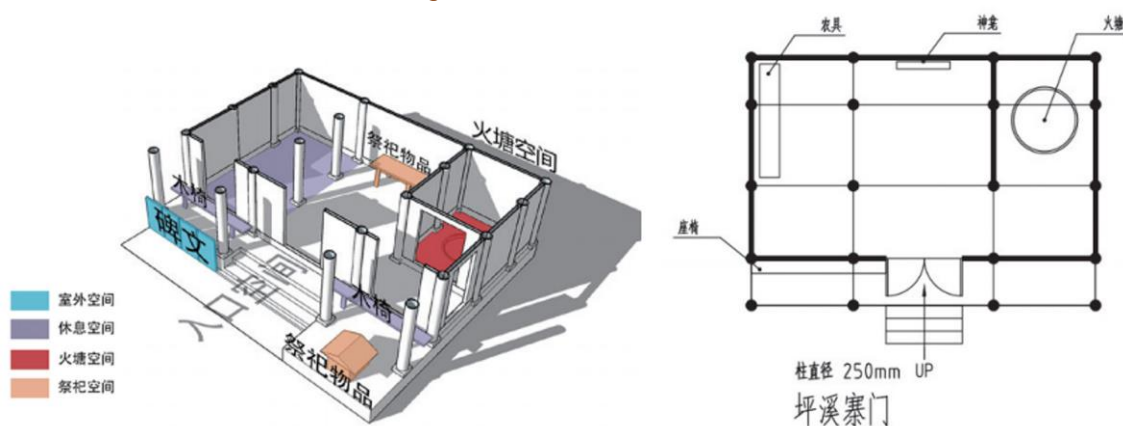
The plans of the national government for future development allow imagine a further sharp reduction of the rural population (National People's Congress, 2021); the government in fact wants to increase the urbanization rate and promotes the regeneration as touristic attractions of the rural villages with relevant heritage and scenic characteristics; the Dong villages in their mountainous setting are among these. Differently from several other cases in China, where the vernacular architecture has been demolished and replaced, these villages have preserved, at least partially, their cultural traditions, practices, and landscape with the support of the national guidelines (UNESCO, 2008).

If the Dong rural population is shrinking and aging, the minority as a whole is not: if in 1953 the registered Dong population was 712,802, in 2021 was 3,495,993, almost 4 times (Zheng, Sun 2018),

showing that it is the local rural culture, not Dong’s population, that is at risk of disappearing or misrepresentation for the over-exploitation due to mass tourism, also because in contemporary China what is historically rural is usually classified as underdeveloped and waiting for change to improve, that is to say to become “modern” (Cao, 2009).

Because of the shrinking and aging of the original population and the pressure for modernization, on one side the traditional social and ecological practices and folklore of the rural community fail to interpret the new lifestyles and evolved culture, on the other side the local inhabitants able and willing to express and perform them diminish. Similarly, the old traditional buildings serving and conserving the traditional practices risk vanishing, both as physical elements and geography of intangible practices.

Figure 1. Typical ground floor of a Drum Tower in a Dong village in the Tongdao area; Pingxi drum tower, built in 1612



Source: Own elaboration of the field work data.

Figure 2. Yashang Drum Tower, Tongdao, Hunan Province



Photo by the authors.

2.1 *The heritage of the Dong minority, the drum tower*

One of the most relevant expressions of the cultural heritage of the Dong minority is the Drum Tower (鼓楼) in their rural villages. The wooden structure and the adjacent open space, large enough for the gathering of the entire community, are usually in the centre of the village and used for traditional rituals and public events (Gao, 2007). If the Dong village is built on steep land, the ensemble of the tower occupies a gentle hillside or creates a flat surface to offer a comfortable space for the community. The ongoing research has mapped and analysed the elements of 75 drum towers in the Tongdao area in Hu'nan Province and defined the evolution of the structure over the centuries (Ma, Peng, Wang, 2019).

Figure 3. Lusheng Drum Tower, Yutou, Hunan Province



Source: Photo by the authors.

The Drum Tower in the Tongdao area is the main place for the cultural and spiritual life of the Dong minority and even though its origins are uncertain because Dong's people do not have a written language, it can be traced back to the Tang Dynasty (Shi, 1985). Initially, the structure was a single column and an open space, but when its functions multiplied and it was influenced by the Han "drum tower" during the Ming Dynasty, the structure evolved into a hall with four to six columns and wooden partition walls, forming a covered space for political, cultural, and ritual gatherings, such as fire, worship, storage of agricultural tools and everyday public interaction (Zhang, 1986). The structure also gradually evolved from the original hall with benches to a tower, adding a wooden second floor for villagers' indoor daily activities and a light tall wooden structure forming a distinctive pyramidal form; this architectural shape expresses vividly the local ethnic cultural traits (Pu, 1989). In the evolution toward a more complex structure for public activities also the inner space of the tower diversified from the model of the ordinary folk house to a more complex composition. (Figure 1, 2, 3)

In their transformation over the centuries, the combination of the structure with the open space also expresses the spiritual evolution of the Dong minority: some outdoor stone shrines to pray were added to the main structure and this practice continues today. The drum tower has a simpler variation at the entrance or exit of the village: an open-air hall forming a public space for traffic and trade (Figure 4).

Given the locally limited materials available (mud, wood, stone) and the building techniques historically developed by the Dong community, the Drum Towers are simple in composition, in building components, and decoration. These wooden structures are also easily damaged and vulnerable to fire and natural erosion, only a few of them are older than 100 years. It has to be noted that traditionally these structures have been rebuilt over and over, replacing elements and decorations when needed according to unchanged principles and techniques (Chen, 2016).

Figure 4. Qingwuzhou Drum Tower, Tongdao, Hunan Province



Source: Photo by the authors.

Figure 5. The rebuilt Huangdu Drum Tower, Tongdao, Hunan Province



Source: Photo by the authors.

2.2 *The project of valorisation of the Dong's drum towers*

The phenomenon of shrinking villages, both demographical and cultural, combined with the fragile state of the drum towers, both architectural and cultural, increases the risk of vanishing for these buildings at the core of Dong's public life and cultural environment.

The approach to protection and conservation of the built heritage has greatly improved in China since 2008 when a seminal regulation was issued, but the level of protection of the authenticity of the elements varies according to the specific requirements of the local governments which enforce the national regulation. In 2008 the national government has issued the Regulations on the Protection of Historical and Cultural Cities, Towns and Villages (UNESCO, 2008), which introduces general directions for conservation such as:

- The historical cities, towns, and villages should be protected integrally: the ancient spatial layout, historical landscape, and traditional patterns should be preserved together with the surrounding natural environment.
- In the core protected area, historical buildings cannot be demolished.
- Buildings in protected areas should maintain the existed height, volume, and colour.
- The construction activities in historical areas cannot damage the authenticity and integrity of ancient buildings.

Within this general frame, which aligned China with the UNESCO guidelines, each local government defines the balance between conservation and valorisation, usually in the case of villages for attracting tourism.

In rural heritage contexts, most planning focuses on the preservation of the traditional façade, not the whole structure; it allows the substitution of the whole original building; accepts substantial modifications to improve the image or performance of the heritage. Modifications in the rural villages have the goal to strengthen the regional ethnic culture brand, create an upgraded version of the countryside lifestyle and improve comfort and infrastructures, but this way they usually destroy traditional details and authenticity (Dai *et al.*, 2019; Long *et al.*, 2017; Li *et al.*, 2013).

The attempts of conservation-valorisation of the Drum Towers in the Dong villages so far have varied from the continuity with the ancient practices of restoration to radical transformations (Zwenger, 2006). The recurrent restoration of the structure according to the rules of the ancestors and the original building materials, and this way passing on intangible cultural heritage, has exemplarily been applied in the Zhaoxing Dong village (Gao, 2007). The reconstruction of the original tower into a taller and larger structure, to make it more impressive, but in the same style of the ancient one (Figure 5) happened in Baojing Dong Village, which had to be rebuilt after a big fire that destroyed the original structure. These kinds of radical transformations are presented by the proposers as an upgraded version of the original tower, a way to highlight its cultural characteristics. This approach is coherent with the desire of developing a touristic image and facilities: in recent years several touristic and cultural facilities with an ethnic style were built in the Dong villages and only some traditional residences still retain their residential function.

3. The shrinking settlements in the pre-Saharan valleys of southern Morocco

A second interesting case study for understanding the transformation process of shrinking settlements is the Anti Atlas region that stretches from the Atlantic Ocean to the inland region of southern Morocco. This area is characterised by a strong cultural identity historically associated with the passage of trans-Saharan caravan routes, as well as the importance of oases and rammed earth settlements with very specific architectural and urban characteristics.

As we descend the southern slopes of the High-Atlas towards the Anti Atlas, the influence of the Mediterranean gradually gives way to that of the Sahara: the date palm tree becomes widespread, and the oases expand; The traditional irrigation systems diversify and the *khetaras* emerge; Mountain villages give way to fortified settlements in progressively wider valleys; and the preponderance of stone in vernacular architecture is replaced by earth construction techniques (Terrasse, 2010; Curtis, 1983).

The characteristic landscape of these pre-Saharan valleys is shaped by the clear contrast between the non-irrigated areas and the oases that determine the layout of the traditional dense settlements (Figure 6) and often the various forms of contemporary urban expansion. The traditional villages of the region take the *Amazigh* name of *Igherm* (plural *ighermen*) or the Arabic name of *ksar* (plural *ksour*) (cf. Terrasse, 2010). Those traditional villages constitute one of Morocco's best known and studied vernacular built heritage, particularly in the valleys of Ziz and Ghéris (Tafilalt), Dadés and Draa (Jacques-Meunié, 1962; Terrasse, 2010; Hensens, 1969; Nijst *et al.*, 1973; Jürgen, 1981; Curtis, 1983).

The most frequently described structure of the *Ksar* corresponds to a fortified settlement with a rectangular plan (rampart reinforced by towers) and a single entrance door, from which the main collective structures and spaces used to be organised: the gateway (a covered space with multiple functions), the entrance plaza (Figure 7), the mosque, an accommodation for hosts and foreigners, spaces for livestock, etc.

On the opposite side, the residential areas were sometimes organised in a ramified structure, reflecting the different levels and scales of social organisation, in which each group inhabited the same area and shared common structures and spaces. Beyond this generic description, there is a great typological diversity that refers, for example, to different circumstances of implantation (hilltop settlements), models of spatial organisation (main T-shaped street structure with three doors in the rampart) and collective and social organisation (number of walled settlements or presence of the collective granary).

Thus, the traditional settlement combined a primarily defensive character with a hierarchical spatial-social organisation in the different quarters, represented by councils of elders and notables who established the collective government. The transformation of the urban settlement constituted a collective process, and no member of the community could build his house outside the walled enclosure. In fact, the enlargement or abandonment of a *ksar* was dependent on a decision involving the entire community (Hensens, 1969). “For some considerable time, the loam structures are repair after rainy periods until the situation has become untenable and the residents build a new settlement on or preferably beside the site of the old village, ‘like a snake changes its skin’” (Nijst *et al.*, 1973). Hensens (1969) even states, possibly with some exaggeration, that the duration of a *ksar* would correspond to 4 to 8 generations or 100 to 200 years, after which the population would establish a new settlement close to the old one.

Thus, within the persistence of the model, the story of each *ksar* must be told through interpretation of the forms of successive change. Edith Wharton (2009) sums up this condition of permanent change very well when she writes, in the late 1920s, “Everywhere behind the bristling walls and rock-clamped towers of old Morocco lurks the shadowy spirit of instability. Every new Sultan builds himself a new house and lets his predecessors’ palaces fall into decay, and as with the Sultan so with his vassals and officials. Change is the rule in this apparently unchanged civilization, where ‘nought may abide but Mutability’.

Figure 6. Ksar Tissergate, Draa valley



Source: Photo by the authors.

Figure 7. Ksar Maadid, Tafilalt



Source: Photo by the authors.

3.1 *The transformation of the oasis landscape from the second quarter of the 20th century*

The first half of the last century marks the beginning of a process of profound transformation that has both a generic dimension (identical to the other case studies presented) and a particular dimension (specific to the Saharan region and southern Morocco). Adam (1951) very pertinently identified the different conditions of this change process, despite focusing on the north-western area of the Anti-Atlas characterised by the influence of the Atlantic Ocean and by a settlement pattern distinct from the one we are describing (cf. Costa & Batista, 2021). Among the different conditions for this change are the pacification process and the end of tribal warfare, the importance of the French protectorate and the role of the state, the loss of relevance of local social institutions at various scales, the growing importance of emigration processes to northern cities and abroad, and finally cultural changes and the preponderance of a more individualistic approach.

As the 20th century progressed, the *ksour* were affected by population loss as well as by the shrinking process, replicating some of the themes that characterise the contemporary transformation of historic intramural settlements in other Mediterranean areas. In many cases, this process was preceded by progressive densification and over occupation of the walled area, with successive cycles of parcelling and growth in height in domestic architecture. This model of urbanisation has lost significance for the community in the context of the changes mentioned above, including the end of tribal conflicts and the loss of importance of the defensive function of urban settlements (Hensens, 1969). Some of the wealthier or better-off owners began to build new residences outside the walled enclosure, in a trend that would become more pronounced in the regions of greatest emigration.

This process was accompanied by a typological change in domestic architecture which, among other aspects, included a clear separation between the livestock outbuildings and the house itself. Sometimes, the old dwellings were converted into spaces for livestock and agricultural crops when the new houses were built outside the walls. The decaying *ksour* very often became the residence of low-income inhabitants, vacant buildings, old dwellings divided between heirs and outbuildings occupied by livestock. The loss of social status of the old settlement and the emergence of an architectural and urban conception within the community that did not conform to its previous values definitively framed the historic centre processes of emptying and abandonment (Figure 8, 9).

Thus, the decadence of the ancient *ksar* became a transversal process in all the sub-regions of the Anti-Atlas, occurring both in situations of demographic recession and depopulation and in contexts of significant urban expansion in the surrounding landscape (cf. Naji, 2013). In the 1960s, Hensens (1969) underlined the importance, for this process, of a central administration distant from the specific socio-cultural context of the region. Along with the disappearance of the defensive dimension, the subdivision of collective land and the gradual preponderance of a more individualistic culture, state planning also contributed to the change in the urbanisation model. This is particularly evident in the solutions proposed for infrastructures and public facilities (the layout of new roads and the proposal of schools or *souqs*), often without considering the former settlement's internal structure.

Figure 8. Ksar Ouled Sidi Brahim, Tafilalt



Source: Photo by the authors.

In general, the layout of the new roads privileged the crossing of the rear area of the fortified settlement, not interfering directly with its main compositional axis (oasis/ wall gateway/ collective spaces/intramural residential areas), opening new conditions for urban expansion. In fact, the road functioned, in many cases, as an element of structuring the urbanisation outside the *ksar* (cf. Gil-Piqueras, 2018), constituting an element of attraction for the first dwellings outside the walls and organising a secondary network of streets in relation to the pre-existing elements of the landscape.

During this period, the *ksour* were subjected to different processes, either retaining its original enclosed configuration, opening new doors in the wall in connection with the new axes of urban expansion, or supporting the juxtaposition of new dwellings that would make the original wall indistinct (cf. Hensens 1969; Jürgen, 1981).

Figure 9. Ksar Ouled Sidi Brahim, Tafilalt



Source: Photo by the authors.

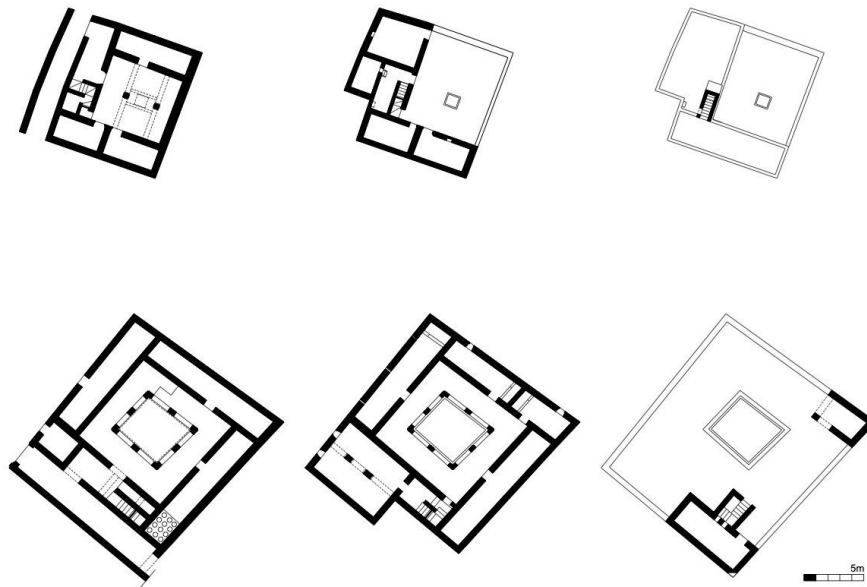
3.2 *Proposals and initiatives for the ksour as shrinking settlements*

The characterisation that different authors have made of the traditional settlements of the Anti-Atlas has largely focused on the conditions for safeguarding the landscape, urban and architectural heritage, and their adaptation to environmental circumstances (Cf. Biondi, 2005; Achenza, 2011; Najji 2013; Gil-Piqueras, 2018). Thus, the study of traditional architecture has highlighted the use of local materials, with earth construction techniques (walls and roofs) and the use of wood (especially palm date tree) for floor and roof structures. In terms of domestic space, most buildings were organised around a central space or courtyard, which could be covered either on the ground floor or on the upper floor (Figure 10, 11), where a skylight allowed for light control. The consolidation and densification of the urban space comprised narrow streets (with width determined by the passage of loaded animals) that were covered by the upper floor of the dwellings in most of their layout.

As we have seen, the urbanisation model has changed significantly in recent decades. Urban expansion areas are characterised by wider streets (adjusted to mechanical means of transport). Domestic architecture nowadays comprises a greater typological diversity, with buildings often developing only on the ground floor. Post-industrial construction processes (especially concrete) have become widespread in most of the region's settlements, acquiring an expression of modernity from the perspective of local communities. As is evident, these changes prove to be much less adjusted to environmental and climatic conditions than those of traditional models.

This is a generic and recurrent trend in different territories of the global world, which are emphasised in the pre-Saharan region considering the environmental circumstances in the context of climate change.

Figure 10. House Typologies in Ksar Ouled Sidi Ibrahim and Alougoum, Anti-Atlas



Source: Own elaboration of the field work data.

Figure 11. Alougoum, Western Anti-Atlas



Photos by the authors.

Alongside the environmental dimension (and the possible importance of traditional systems for the definition of future proposals), research on the processes of shrinking settlements in pre-Saharan area has also focused on the dimension of heritage safeguarding. A very interesting example for this reflection is the Ksar d'Assa in the western region of the Anti-Atlas. The intervention to rehabilitate this old settlement raises an important question regarding the model for safeguarding unoccupied sites with structures and buildings of exceptional value. In this regard Salima Naji (2013) argues that the situation of complete abandonment constitutes an opportunity insofar as it makes it possible to preserve the original structure that has not been irretrievably altered in contemporary times. Therefore, it is considered that the abandonment of the site has made it possible to conserve its urban, architectural, and aesthetic qualities, enabling the decision-maker to adopt policies of integral conservation. In this sense, the proposed intervention could be like the one carried out at Ait-Ben-Haddou inscribed in the World Heritage List. Therefore, the conservation or rehabilitation proposal would take place before any solution of [re]appropriation by the community, which in exceptional sets may be perfectly justifiable. Another alternative in these cases could be to understand the site from its archaeological point of view, envisaging the conservation and rehabilitation of only some of the buildings, as was the case in Ksar d'Assa. In this regard, we should highlight the exemplary conservation practice developed by Salima Naji in the continued approach to the local communities, which has allowed the safeguarding of numerous amazing sites such as the collective granaries of Tizgui or Amtoudi (Figure 12).

Figure 12. Amtoudi, Western Anti-Atlas



Source: Photo by the authors.

Other initiatives of intervention extended to the urban area as, for example, the "Programme de valorisation Durable des Ksour et Kasbah du Maroc" have been developed under the promotion and conception of the central administration. In this case, the intervention privileged the *ksour* with relative dynamics and heritage value, very often characterised by the juxtaposition of inhabited traditional houses, ruined constructions, and new buildings. The selection criterion thus comprises the feasibility of an integrated rehabilitation to attract new residents, seeking to demonstrate the viability of the *ksour* model and the use of traditional local techniques and materials. To this end, the intervention provided for considerable investment in integrated interventions in public spaces, collective buildings, and a considerable number of private dwellings, as has occurred in Alougoum or Ksar Taourir. This program is like the ones developed in inland regions of other countries that prioritise cultural tourism as a factor for local development, seeking to counter the tendency to abandon some

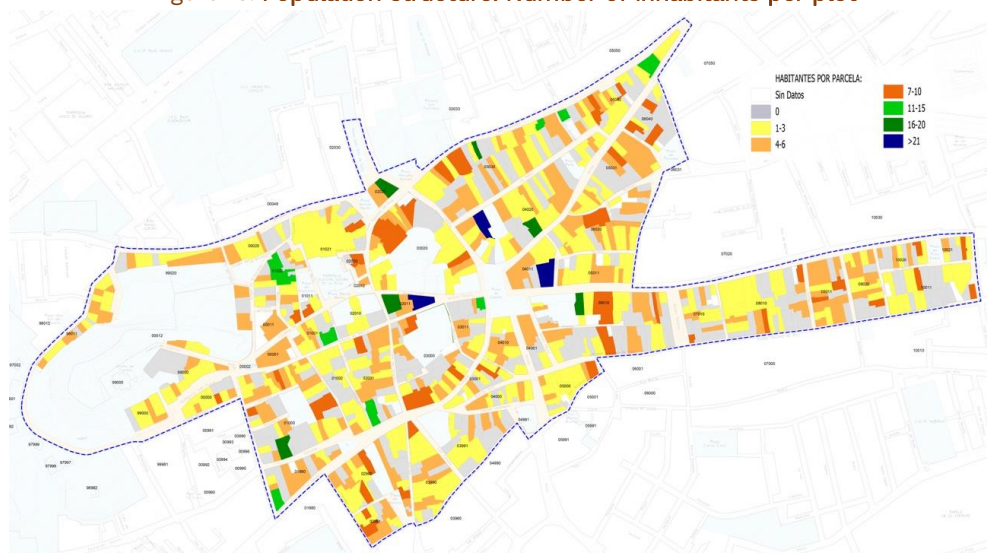
traditional villages. Other more recent academic studies and proposals tend to integrate the *ksour* in a comprehensive dimension of heritage, considering the fundamental link with the oasis landscape and the irrigation systems, as well as with the practices of the community and intangible heritage. This approach is particularly relevant in the study region, being in line with the changing paradigms and concepts of heritage that have marked the debates on the subject on a global scale. Within this more integrative perspective, the Figuig Oasis has been included in the Tentative List for nomination as a UNESCO heritage site.

4. Internal shrinking in the medium-sized cities of Western Andalusia, risks and opportunities for vernacular architecture

The territory of the western half of Andalusia, in the south of Spain, is characterised by a structure formed by a network of large rural settlements with an economy closely linked to extensive agriculture. Despite their rural scope and spirit, they are mostly medium-sized towns, often with more than 20,000 inhabitants and with large historic centres in which popular domestic architecture has a strong physical presence and cultural relevance. Until the first half of the 20th century, this architecture supported the daily life and culture of most of a population dedicated to agricultural work. However, from the 1950s onwards, the progressive industrialisation of agriculture and the need to improve housing conditions began to have a double impact on these towns and their traditional popular architecture.

There was a strong displacement of the population on two levels. On the one hand, there was a strong migration from rural to urban areas – concentrated in the provincial capitals – where industrial development requires labour and where there was access to better services. On the other hand, in the rural settlements themselves, historic centres and traditional architecture was being discarded in favour of new growth areas with new facilities and housing (Figure 13). As a result of these two processes, the following decades saw a progressive depopulation of urban centres with the abandonment of vernacular domestic architecture as the main protagonist.

Figure 13. Population structure. Number of inhabitants per plot



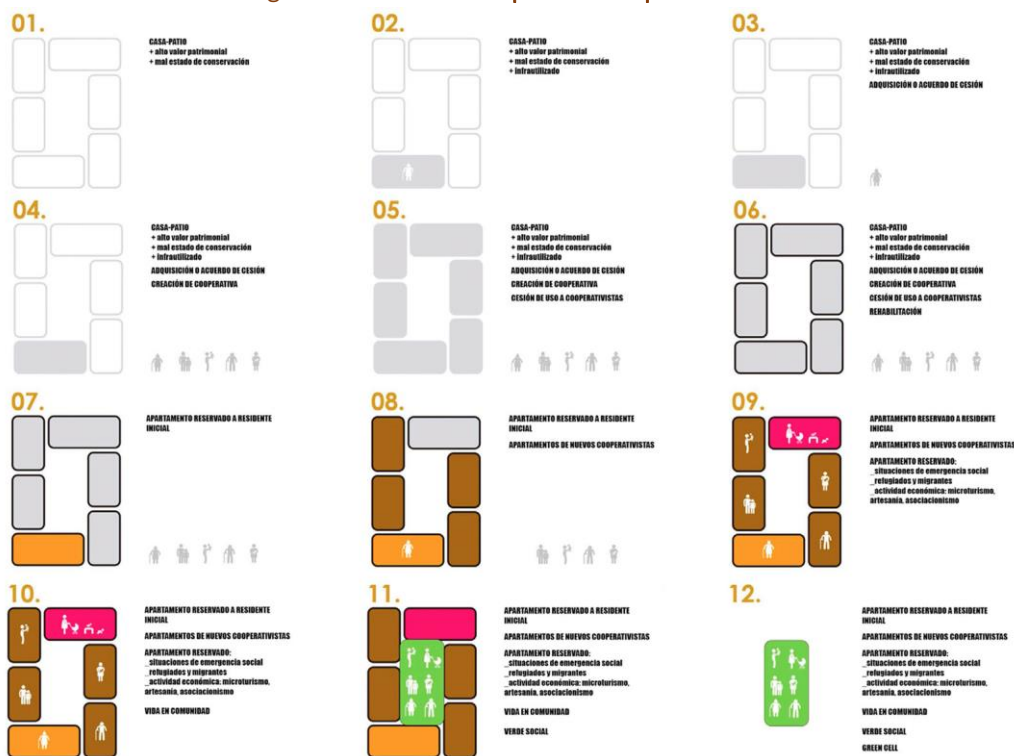
Source: Historical Ensemble Special Protection Plan for Lebrija. Initial Approval Document. (2014).

The domestic vernacular architecture of these areas is strongly conditioned by the urban fabric, characterised by narrow streets and large blocks with narrow and deep plots. Thus, the vernacular

domestic architecture of these urban centres is configured by the juxtaposition of different buildings parallel to the façade alternating with internal open spaces, both domestic and linked to agricultural tasks. Their abandonment has been due to society's inability to adapt the historic city and traditional house typologies to new needs, mainly private vehicle access and adaptation to new family and health standards. However, ongoing research and recent experiences demonstrate the resilience of popular domestic architecture and its capacity to respond to the housing needs of today's population.

4.1 Domestic vernacular architecture as a housing resource

Figure 14. Activation sequence of a patio house



Source: Gaia Redaelli (2020).

If the technical and social inability to adapt the vernacular house to new needs during the second half of the 20th century was a serious problem for its conservation, in the first half of the 21st century it may become the solution to two widespread problems: the depopulation of historic centres and the need for housing by the younger generations. Numerous initiatives, both public and private, are gradually trying to provide solutions to housing needs by building on existing housing rather than constructing new units. Some of them focus on traditional popular architecture, as is the case of the association PAX- Patios de la Aixerquía. This is an initiative that focuses on the rehabilitation of houses in the historic centre of Cordoba through cooperative processes, which allow the local population – mostly aged and without resources – to continue living in their homes, while the younger generations obtain affordable housing, providing the necessary financial resources for the rehabilitation of the buildings. The initiative is based on three fundamental pillars: urban ecology, cultural heritage, and social housing. In this way, the association condenses into its proposal's major areas of interest today (Redaelli, 2019).

In short, it combines the lack of conservation of these courtyard houses – due to the gradual abandonment and lack of resources of their current inhabitants – with the housing needs of the younger generations. Through a collaborative process, which is materialised through a housing

cooperative, the owners provide the houses, while the new inhabitants provide the capital necessary for the development of the works. In this way, everyone contributes what they have – buildings for the former and solvency for the latter – and receives what they need – renovation of the buildings for the former and a home for the latter – while at the same time recovering the permanent population in the historic centre and preserving and enhancing the cultural heritage of the patio houses (Figure 14).

4.2 *The hallway, patio, and backyard house residential capacity*

One of the typologies of popular residential architecture that is widely recognised in this territorial context is the house with hallway, patio, and backyard. It is located in the province of Seville – but also in the neighbouring territories of Huelva, Cádiz, Córdoba or Badajoz – where examples have been recognised that respond to a wide chronology that ranges from the stabilisation following the conquest of Al-Andalus by the Crown of Castile in the 14th century to well into the 20th century, when the processes of agricultural modernisation and the changes in the family paradigm overcame the capacity for adaptation demonstrated by this typology in the preceding centuries (Gómez, 2020). It is a house between party walls made up of an alternation of built bodies with free spaces in accordance with the sequence consisting of the façade body, patio, intermediate body, and back yard. The whole complex is registered by means of a system of independent passages composed of the hallway and the passageway of the intermediate body, which frees the rooms from the transit easements and allows access for tools and animals to the back yard. Most of the buildings have double bays, one storey high and sloping ceramic tile roofs, under which are located the "soberados" (spaces under the roof used for agricultural storage), which gradually gained height to house living quarters until they became real living quarters.

Returning to the case of the Historical Complex of Lebrija mentioned above, the Special Plan catalogues 154 buildings, of which 39 correspond to this house typology with entrance hallway, patio, and backyard (25.32%), offering a total built surface area of 15,418 m². Based on the relationship between the useful and constructed surface areas of these buildings and the programmatic requirements for social housing in Andalusia, these houses could house up to 190 dwellings, covering the subsidised housing needs for several years.

Ongoing research into this typology, its documentation and its residential capacity has made it possible to develop proposals for the rehabilitation of these buildings, adapting them to current needs while at the same time preserving their heritage values. Until the beginning of the 20th century, families had many members and often included two or three generations, who occupied the different spaces in these houses, sharing common elements such as courtyards or kitchens. Nowadays, the dimensions of these houses make it possible to house different apartments and the layout of their distribution elements guarantee the independence between the areas necessary to house different families.

In addition, the system of access for animals to the farmyard allows comfortable access by single person means of transport, which is better integrated into these increasingly pedestrianised historical complexes. During the process of developing agile systems for the documentation of domestic vernacular architecture, the residential capacity of some of these properties in Lebrija has been analysed. Applying the design criteria for social housing – as minimum criteria – and the protection tools established by the Special Plan, we obtained results that confirm the capacity of these buildings to house numerous families who require housing and whose economic resources will contribute both to the rehabilitation of the buildings and to the revitalisation of the historic areas (Figure 15).

Figure 15. Hallway, patio, and backyard house in Lebrija



Source: Survey and proposal by the authors.

5. Conclusions

The article presents three case studies in rural contexts in three different parts of the world, in China, in Africa and in Europe. These three cases have a phenomenon in common that has been widely studied and discussed in recent years for its negative impacts on the built settlements: the population and cultural shrinkage.

The cases taken into consideration are different in location, period of realization, scale, status of conservation of the vernacular architecture, but share the main reason for the decay: the abandonment of traditional style agricultural production. The shrinking of the population – partial or complete abandonment in Morocco, declining population in Spain, depopulation and aging demographic structure in China – impacted differently the 3 cases and consequently different solutions are defined for dealing with the issue: attempts to valorise the architectural structures with different levels of conservation and awareness of the value of authenticity; regeneration of residential buildings by the local inhabitants; a debate about the possibilities of intervention, ranging from archaeology to integration of old and new. Nevertheless the 3 cases share some conditions in dealing with the consequences of the phenomenon, which can be summarized as follows:

- Adaptation difficulties - the difficulty in adapting the vernacular architecture to the increased wealth and changed lifestyles of the original community, in finding the balance between conservation and transformation both technically and culturally. This difficulty is also a struggle in interpretation, imagination, and vision: the rural past and its practices, strongly connected to the inherited ancient built environment, seems to have no role in the contemporary and future development in all cases considered.
- Administrative distance - the central administration is distant from the socio-cultural milieu of the region; the socio-economic progress has defined marginal places, “slow” territories that are left behind, either programmatically, as in China, or for the lack of understanding and consequently valorisation of their potential resources.
- Heritage fragility - the material fragility of the heritage and the cultural uncertainties in investing resources for its conservation, both for its actual structural condition and for its being vernacular, i.e., common, and modest, not outstanding, in architectural features and decoration. To restore and maintain minor heritage requires, paradoxically, great skills, sensibility, and awareness.

Given the different conditions and cultural background, as well as the different stage in the definition of the actions for their valorisation, these cases do not share the cultural and technical process to define the transformation, nor the solutions adopted and the resilience of vernacular architecture to the changed society. In the following paragraphs the different conclusions from each case are synthesized.

In China is happening what already happened often in the rural world when the economic production shifted to an industrial and tertiary one, but with one remarkable difference: the unprecedented speed of the cultural obsolescence, because in only 20 years the typical and understandable past has become ancient and often useless and the old structures have not been the object of a slow and constant upgrade to keep up with the evolution of their residents. Only some traditional residences in the Dong villages still retain their residential function and several touristic and cultural facilities with ethnic style were built in recent years. As the characteristic cultural heritage of the Dong nationality is expressed by the Drum Tower, it is constantly replicated in new touristic facilities, in various ways. These new Drum Towers have lost their role and original functions, making it impossible for tourists to experience the original one. Further considerations and experiments by the heritage promoters are required and some scenarios of development can be imagined: either the villages lose

their original residents and are maintained as an ethnic theme park, or they will be the emphasized vernacular background for representations for tourists as often the case in regeneration projects in China, or the original residents and agricultural activities are kept together with the agro-tourism offer, maintaining the original built structures, adapted to the new functions and the new comfort standards but preserving as much as possible the authentic characters.

In the case of the historic centres of the Anti-Atlas region in Morocco, the number of abandoned or under-occupied traditional settlements is extremely high. The situation of shrinking settlements is associated either with processes of demographic recession or with the emergence of new patterns of diffuse and extended urbanisation. In any case, this reality is emphasised in the context of shrinking oasis areas associated with the difficulty of conservation of traditional irrigation structures, demographic recession, and climate change.

The high number of *ksour* in the region as well as their urbanistic and constructive characteristics point to the inevitability of the disappearance of a significant number of these structures. In this context, the various rehabilitation initiatives are of great relevance, considering a more cultural approach in a necessarily rarefied network of intervened settlements. In general, these initiatives seek to have demonstrative effects, intending to induce the use of traditional and sustainable construction systems in a region where the effects of climate change have a dramatic expression. The Anti-Atlas region has received the attention of numerous research groups and universities in the field of architecture. The motivation of these groups stems from the social and spatial dimension of the heritage of earthen architecture at risk and its importance in adapting to extreme environmental conditions.

The academic research and public policies have reiterated the importance of deepening the study of the traditional world and its transformation. This experience may prove to be fundamental in order to establish different public policies that fit the specificities of each settlement, addressing local communities or based on their initiative, considering, among others, the following parameters: To what extent does it make sense to assume the archaeological dimension of the abandoned settlements; How can they alternatively constitute an underlying structure for new constructions and organisation models in a framework of greater complexity and heterogeneity; Or finally, how it will still be possible to convert the ancient *ksour* into a place where ancestral practices of construction and production are combined, in an integrated way, for the formulation of new solutions adapted to the local context and to changing environmental conditions.

The medium-sized cities in Western Andalusia have suffered a gradual shrinking of their historic centres in favour of both new growth areas and larger cities, in search of better housing, service or work conditions, leaving numerous houses of great heritage value empty. These houses, which have long been considered unusable by today's housing standards, are in fact an enormous resource for today's housing needs. For the conjunction of these resources with these needs to offer real solutions, it is necessary to establish tools for coordinated intervention from both the public and private spheres. These mechanisms must be based on the economy of resources – giving priority to rehabilitation over new construction –, the conservation of the built heritage – basing interventions on the knowledge of this architecture – and social solidarity – which will allow generational integration and the fixation of the population in the Historic Areas –.

This article proposes a confluence of open lines of research that will allow the study of mechanisms to reverse the situation and provide wealth from cultural heritage in future works, as the limitations of the format itself prevent the development of these aspects.

Acknowledgements

This work has been developed within the framework of the following projects, which contribute to the funding of editing and proofreading costs: The project "Sistema de Innovación para el Patrimonio de la Andalucía Rural (SIN_PAR)", granted through the 2020 call for R+D+i projects of the PAIDI 2020, with code PY20-00298, and the project "Sistema de Innovación Turística para el Patrimonio de la Andalucía Rural (SIT_PAR)", granted through the 2020 call for grants for the implementation of projects of collaborative interest in the field of CEIS, with code PYC20 RE 029 IAPH. Both grants come from the Secretaría General de Universidades, Investigación y Tecnología of the Consejería de Transformación Económica, Industria, Conocimiento y Universidades of the Junta de Andalucía and have been co-financed by the FEDER operational programme in Andalusia for the period 2014-2020. This work is also part of CEAACP project UIDB/00281/2020 funded by Fundação para a Ciência e Tecnologia – Portugal.

Authorship

The authors have conceived the work together, jointly developing the introduction and conclusions. The case studies, however, have been developed individually by each of the authors. Specifically, Paola Pellegrini and Geng Ma have developed point 2 "The shrinking rural population in China and the vanishing of the traditional cultural environment; a case of minority heritage in China" (pages 4 to 9); Miguel Reimão Costa point 3 "The shrinking settlements in the pre-Saharan valleys of southern Morocco" (pages 10 to 16) and Vidal Gómez Martínez point 4 "Internal shrinking in the medium-sized cities of Western Andalusia, risks and opportunities for vernacular architecture" (pages 17 to 20).

Conflict of interests

The authors declare that there is no conflict of interest.

References

- Achenza, M. (2011). *Il Manuale del Recupero dell'Architettura Storica dell'Oasi di Figuig (Marocco)* (Doctoral Thesis). Università degli Studi di Cagliari, Cagliari. <https://hdl.handle.net/11584/266136>
- Adam, A. (1951). La maison et le village dans quelques tribus de l'Anti-Atlas. *Hespéris*, XIII, 5-78. <http://bnm.bnrm.ma:86/ClientBin/images/book482860/doc.pdf>
- Biondi, B. (Ed.). (2005). *Architectural Heritage and Sustainable Development of Small and Medium Cities in South Mediterranean regions: results and strategies of research and cooperation*. Firenze, Italy: Università degli Studi di Firenze. <https://unesdoc.unesco.org/ark:/48223/pf0000150048>
- Cai, L. (2007). *Traditional Villages and Architecture in the Dong Settlement*. Beijing: China Architecture & Building Press.
- Cao, F. (2009). Modernization Theory and China's Road to Modernization. *Chinese Studies in History*, 43(1), 7-16. <https://doi.org/10.2753/CSH0009-4633430101>
- Chen, X. (2016). Academic origins and characteristics of the Chinese stylistic restoration. *Frontiers of Architectural Research*, 5(3), 353-359. <https://doi.org/10.1016/j.foar.2016.04.004>

- Costa, M. R. & Batista, D. (2021). Tagnit n'Abdiy. A arquitetura e a paisagem da região nordeste do Anti-Atlas em Marrocos. In M. R. Costa et al. (Eds.), *Villages perchés. Architecture et paysage* (pp. 60-65). Lisboa, Portugal: Argumentum/CEAACP/CAM.
- Curtis, W. J. R. (1983). Type and Variation: Berber Collective Dwellings of the Northwestern Sahara. *Muqarnas*, 1, 181-209. <https://doi.org/10.2307/1523077>
- Dai F., Liu J., Yang J. (2019). Implementation evaluation and explanation of traditional village protective and developmental planning in Guizhou. *Shanxi Architecture*, 22, 33-35. https://caod.oriprobe.com/articles/57905487/Implementation_evaluation_and_explanation_of_trand.htm
- FAO - UN. (2015). Globally Important Agricultural Heritage System. <https://www.fao.org/giahs/giahsaroundtheworld/designated-sites/asia-and-the-pacific/dongs-rice-fish-duck-system/en/>
- Gao L. (2007). Conservation and Tourism Development of Zhaoxing Dong Village. *Development of Small Cities & Towns*, 3, 77-80.
- Garnaut R.; Song L.; Fang C. (Eds). (2018). *China's 40 Years of Reform and Development: 1978-2018*. ANU Press - open-access university press.
- Gil-Piqueras, T. (2018). El Khorbat. Desarrollo urbano. En T. Gil-Piqueras y P. Rodríguez-Navarro (Eds.), *Hábitat y desarrollo en el Sur de Marruecos. El Khorbat en el Oasis del Ferkla*. Lisboa, Portugal: Argumentum. https://www.academia.edu/37312144/2018_H%C3%A1bitat_y_desarrollo_en_el_Sur_de_Marruecos_EL_Khorbat_en_el_Oasis_del_Ferkla
- Gómez Martínez, Vidal. (2020). *La casa sin nombre – Una casa popular tradicional en la provincia de Sevilla*. Campo Arqueológico de Mértola. <https://www.camertola.pt/recursos-eletr%C3%B3nicos/la-casa-sin-nombre-una-casa-popular-tradicional-en-la-provincia-de-sevilla>
- Grasland C., Ysebaert, R., Corminboeuf, B., Gaubert, N., Lambert, N., Salmon, I., Baron, M., Baudet-Michel, S., Ducom, E., Rivière, D., Schmoll, C., Zanin, C., Gensel, J., Vincent, J., Plumejeaud, C., Van Hamme, G., Holm, E., Strömngren, M., Coppola, P., salaris, A., Groza, O., Muntele, I., Turcanasu, G., and Stoleriu, O. (2008). *Shrinking Regions: A Paradigm Shift in Demography and Territorial Development*. Study for Directorate-General for Internal Policies of the Union, Policy Department B: Structural and Cohesion Policy, European Parliament. Brussels: European Parliament. [https://www.europarl.europa.eu/thinktank/en/document/IPOL-REGI_ET\(2008\)408928](https://www.europarl.europa.eu/thinktank/en/document/IPOL-REGI_ET(2008)408928)
- Gregory B.; Meng X. (2018). *Rural-to-urban migration and migrants' labour market performance, 2008-16*. In Garnaut R.; Song L.; Fang C. (Eds). (2018). *China's 40 Years of Reform and Development: 1978-2018*. ANU Press - open-access university press. http://www.iberchina.org/files/2019/40_years_reform_china_anu.pdf
- Hensens, J. (1969). Habitat rural traditionnel des oasis présahariennes. Le *qsar* – Problèmes de rénovation. *Bulletin Économique et Social du Maroc*, 114, 83-107.
- Jacques-Meunié, D. (1962). *Architectures et habitats du Dadès (Maroc Présaharien)*. Paris, France: Klincksieck.
- Jürgen A. (1981). *Wohn-und Siedlungsformen im Süden Marokkos*. München, Deutschland: Callwey.
- Keats S., & Wiggins S. (2016). *Population change in the rural developing world. Making the transition*, London, Overseas Development Institute. <https://cdn.odi.org/media/documents/10374.pdf>
- Li, H. (2019). *Population Mobility and Cultural Change in a Zhuang Village*. Beijing: Social Science Academic press.
- Li, X.; Lan T.; Yang H. (2013). Study on the Protection and Development of Traditional Villages in Southeast Qianjiang--Take Dong Village as an Example. *China Ancient City*, 7, 64-67.
- Long C., Zhou Z., Lu G. (2017). On the Protection and Development of Traditional Villages of the Dong nationality. A Case Study in Liping County of Qiandongnan. *Guizhou Ethnic Studies*, 38(01), 83-88.

- Ma G., Peng, L., Wang, D. (2019). The Evolution of Plane Layout of Dong Nationality's Drum Tower in Tongdao Area, Hu'nan Province. *Huazhong Architecture*, 37(01), 109-112.
- Ministry of Foreign Affairs of the People's Republic of China. (1999). *National Minorities Policy and Its Practice in China, V. Preservation and Development of the Cultures of Ethnic Minorities*. <https://www.mfa.gov.cn/ce/cegv/eng/bjzl/t176942.htm>
- Naji, S. (2013). *Le Ksar d'Assa. Sauvegarde d'un Port du Maroc Saharien*. Rabat, Maroc: DTGSN.
- National Bureau of Statistics of China. (2020). *Census of China 2019*. <http://www.stats.gov.cn/tjsj/ndsj/2019/indexeh.htm>
- National People's Congress. (2021). *Outline of the People's Republic of China, 14th Five-Year Plan (2021-2025) for National Economic and Social Development and Long-Range Objectives for 2035*; Chinese version: 中华人民共和国国民经济和社会发展第十四个五年规划和 2035 年远景目标纲要.
- Nijst, A.; Priemus, H.; Swets, H. L.; Van Ijzeren, J. J. (1973). *Living on the edge of the Sahara. A study of traditional forms of habitation and types of settlement in Morocco*. The Hague, Netherlands: Government Publishing Office.
- Office of the Seventh National Census Leading Group of the State Council, National Bureau of Statistics. (2021). *The Seventh National Population Census Bulletin (No. 2) - National Population Situation*. http://www.stats.gov.cn/tjsj/zxfb/202105/t20210510_1817178.html
- Pallagst K. M., Fleschurz R., Uemura T., Nothof S. (2019) Shrinking cities: Implications for planning cultures? *Urban Studies* 58(4). <https://doi.org/10.1177/0042098019885549>
- Pu, H. (1989). One-legged "Luohan Building" Exploration. *Guizhou Ethnic Studies*, 1, 126-127.
- Redaelli, G. A. (2019). PAX-Patios de la Axerquía y el valor social del patrimonio. *Revista PH*, 13-15. <https://doi.org/10.33349/2019.96.4313>
- Redaelli, G. A. (2020). De la especulación a la cultura de la rehabilitación. La estrategia PAX-Patios de la Axerquía como medida antigentrificación en entornos patrimoniales. *Kult-Ur*, 7(13), 91-116. <https://doi.org/10.6035/Kult-ur.2020.7.13.3>
- Shi, R. (1985). History of Drum Tower. *Guizhou Ethnic Studies*, 4, 112-114.
- Terrasse, H. (2010). *Kasbas berbères de l'Atlas et des Oasis. Les grandes architectures du Sud marocain*. Arles, France: Actes Sud / Centre Jacques-Berque.
- UGC Research Grant. (2018). Adapting Villages. An Architectural Framework for Regenerating Dong Minority Settlements, Hong Kong. <https://condition-lab.com/Adapting-Villages>
- UNESCO Database of National Cultural Heritage Laws. (2008). *Regulations on the Protection of Historical and Cultural Cities, Towns and Villages*. Chinese version: 历史文化名城名镇名村保护条例. <https://whc.unesco.org/en/statesparties/cn/Laws>
- UNESCO. (2009). World Intangible Cultural Heritage of Humanity. <https://ich.unesco.org/en/RL/grand-song-of-the-dong-ethnic-group-00202>
- UNESCO. (2013). World heritage tentative list. <https://whc.unesco.org/fr/listesindicatives/5813/>
- Wharton, E. (2009) *In Morocco*. The Floating Press.
- Zhang, M. (1986). Dong "Drum Tower" Exploration. *Journal of the Central University for Nationalities*, 2, 94-96.
- Zheng, W., Sun, M. (2018) Location and Spatial Distribution with the Ecological Wisdom of Dong Minority Villages. *Landscape Architecture*, 25(06), 69-72.
- Zwerger, K. (2006). *Vanishing Traditions: Architecture and Carpentry of the Dong Minority in China*, Hong Kong, Orchid Press.