ISSN 2712-0554
Heritage and Sustainable Development *Original Research*
Vol. 6, No. 1, May 2024, pp.335-348
https://doi.org/10.37868/hsd.v6i1.384

'Escuela de Balates': Transmission and dissemination of traditional dry stone construction techniques

Elena Correa Jiménez[1,*], José Abellán Santisteban[1], Julio Miguel Román Punzón[1], José María Martín Civantos[1,2]

[1] MEMOLab: Laboratorio de arqueología Biocultural, Universidad de Granada, Spain

[2] Departamento de Historia Medieval y Ciencias y Técnicas Historiográficas, Universidad de Granada, Spain

*Corresponding author E-mail: e.elecorjim@go.ugr.es

Received Feb. 5, 2024
Revised Apr. 18, 2024
Accepted Apr. 21, 2024

Abstract

The Biocultural Archaeology Laboratory (MEMOLab) of the University of Granada undertook the recovery of an ancient agricultural space linked to the medieval *alquería* (village) of Alcázar (Jérez del Marquesado, Granada, Spain). This participatory process comprised several tasks, the most outstanding being the development of a dry stone construction school called the 'Escuela de Balates' offering instruction on how to restore the walls of ancient cultivation terraces. The main objectives of the project were to recover the agricultural space, gain knowledge of ancestral practices, and involve the local population in the conservation of its cultural and environmental heritage.

Keywords: Cultural landscapes, Participatory archaeology, Dry stone walling, Historical irrigation systems, Agricultural heritage

1. Introduction

Among the research strategies adopted since 2014 is that of organizing participatory activities to recover historic *acequias* (irrigation ditches) in collaboration with city councils, *comunidades de regantes* (irrigation associations), and other local bodies. This task was initially developed within the framework of the project FP7 MEMOLA (MEditerranean MOntainous Landscapes) and since 2017 by the Biocultural Archaeology Laboratory (MEMOLab) of the University of Granada.

These activities are carried out through volunteerism and aim not only at recovering the aforementioned historic *acequias*, but, above all, to serve as a tool for social intervention, revitalization, empowerment, and discussion on local ecological knowledge, governance, and environmental, territorial, and agricultural policies. The program led to the recovery of 14 *acequias*, certain abandoned 40 years ago, and has collaborated in the annual cleaning of at least another 30. This equated with interventions on more than 80 km of ditches and the participation of about 1,500 individuals motivated by various interests [1], [2].

This framework also saw a first specific action, notably the recovery of a series of cultivation terraces along the Barranco (ravine) of Jérez (Jérez del Marquesado, Granada) (Figure 1), a task designated as the 'Escuela de Balates' (The Balates School). *Balates* are in fact old cultivation terraces where the earth is retained by *paratas* or *portillos* (dry stone walls). The task therefore consisted of rebuilding and repairing a series of

14th-century dry stone walls in the area of the Torre de Alcázar (Figure 2) as well as recovering a section of an *acequia* and planting native agricultural tree species.

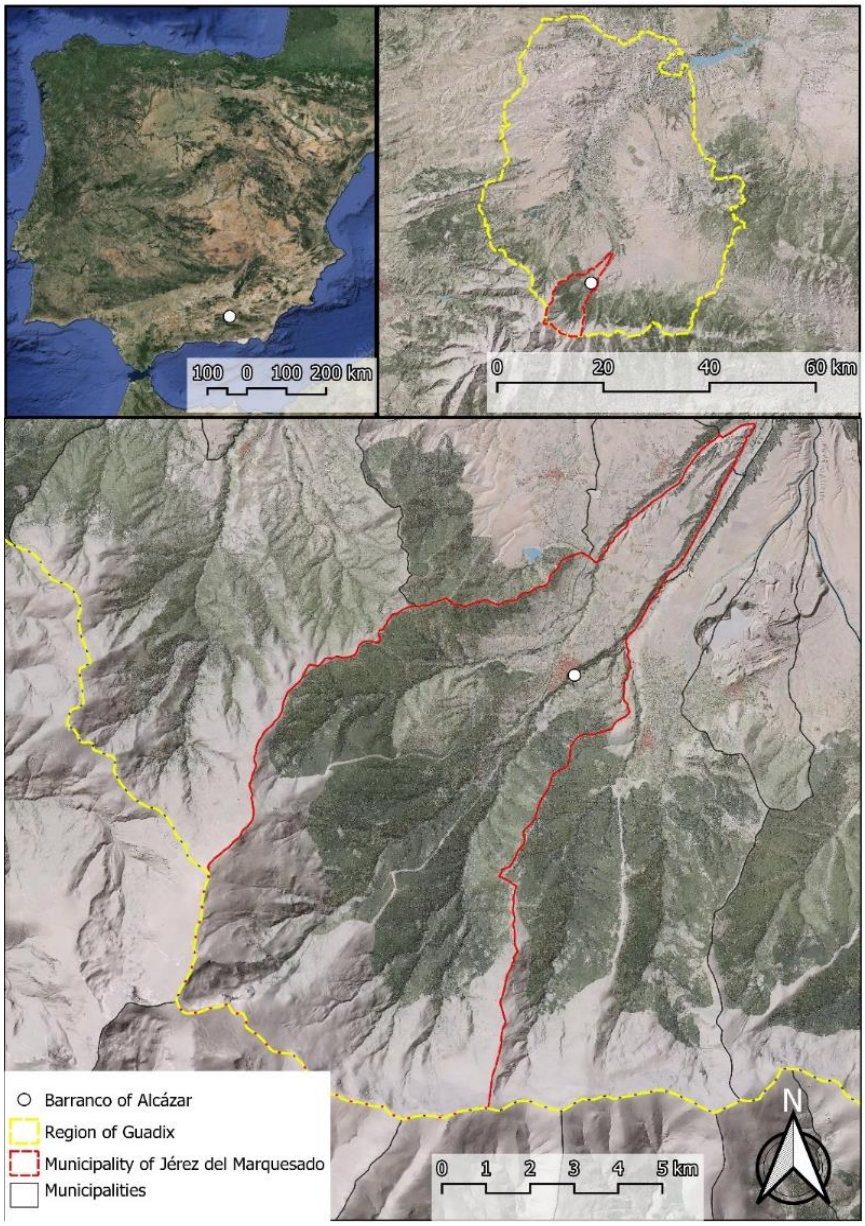

Figure 1. Location of the Municipality of Jérez del Marquesado (Granada, Spain)

The abandonment of these cultivation spaces initially stems from the processes of modernization and rural exodus initiated in the 1960s and, above all, in the 1970s. This first abandonment was ultimately accentuated by the diminishing of irrigation associations responsible for communal water management. However, the main problem faced today is the intensification and industrialization of agriculture, which devastates the landscapes and the rural world as we know it, depleting the resources (mainly water and soil) and leaving a trail of contamination in its path.

These new actions of repairing the old dry-stone walls of the agricultural areas have led to the recovery and revalorization of knowledge and vernacular techniques of dry-stone construction, a feature declared as an Intangible Cultural Heritage of Humanity in 2018 by UNESCO. The task comprised both local and foreign volunteers, including Archaeology and History Master's Degree students of the 'From Europe to America: Societies, Powers, Cultures' (EURAME) of the University of Granada (specifically of the course 'Peasantry and agrarian practices in pre-industrial societies') who acquired and put into practice the skills of this technique

from local maestros acting as guides and teachers. The objective of this course is to delve into peasant forms of production and strategies, aspects that fundamentally include acquiring the logic that governs knowledge, practices, and social relations and the different ways of procuring and applying natural resources for survival. Moreover, part of the content involves analyzing traditional socio-ecosystems stemming from co-evolutionary processes and its practice involves direct participation with irrigation associations and traditional agrarian systems.

2. Theoretical framework

Recovery of historical agricultural spaces forms part of Public Archaeology. It is a means of taking society into account in archaeological projects so as to connect it with its cultural heritage and reinforce its identity through knowledge of history [1]. It was the community, in this case, the population of Jérez, who undertook this recovery. This consisted, on one hand, of the local *balatero maestros* charged with imparting the dry stone techniques, and on the other essentially the local populace who acted as their students. Moreover, members of the "Comunidad de Regantes", who manage the distribution of water through the *acequias,* explained the processes as well as the irrigation techniques serving to channel water to the newly planted trees. It was the children of the municipality who were then charged with the task of planting the chestnut and rowan trees thus making them aware of the key environmental role of these trees and how to recover a historic agricultural space of their own town.

This method is based on scientific social research that generates knowledge about reality, seeking the active participation of different individuals made by distinct interests, ages, etc. Local communities comprise active members bearing knowledge that must be preserved to ensure the future of their landscapes. These social groups are validators of scientific knowledge [1, p. 248] framed in the Participatory Action Research (PAR) based on analyses of the reality of local rural communities that serve to empower and improve their social structure. Citizen participation or 'socialization' thus implies a democratization of research, involving and creating spaces for public participation as well as an alternative to the different approaches of heritage valorization [3].

The objective of this type of initiative is thus to create a framework that favors generating, reflecting on, and exchanging traditional knowledge of intangible heritage [1, p. 270]. Moreover, this tool of social intervention aims, above all, to provoke, stimulate, and put in place participatory thought processes linked to action.

Cultural landscapes, in this sense, are privileged spaces for the recognition, memory, identity, and participation which allow deploying a strategy of Participatory Action Research linked not only to scientific knowledge but to the social utility of Science in general and of Archaeology in particular. This type of activity has promoted the preservation of cultural landscapes stemming from the interaction of humans and nature that represent cultural, historical, and environmental heritage. In this specific case, the cultural landscapes are associated with water. Agricultural practices tied to water have molded cultural landscapes of indubitable heritage value that assume a key role in maintaining biodiversity and the environment [1, p. 193]. The cultural landscape of the Barranco de Jérez must thus be understood beyond the realm of the aesthetic as a productive space that is not only agricultural but a producer of numerous environmental values.

3. Recuperating the Barranco of Jérez

3.1. Study area: the Barranco of Jérez del Marquesado

The Municipality of Jérez del Marquesado extends to the north from the peaks of the Sierra Nevada Mountains to the Plain, where the narrow torrents of the Jérez and Lanteira Rivers intersect to open the Hoya (Plain) of Guadix. Jérez del Marquesado is the most populated town in the area of Marquesado del Zenete. Furthermore, it is that which best preserves its traditional urbanism characterized by narrow streets and white unadorned clean houses covered with red tiled roofs [6, p. 44]. The Municipality possesses a rich archaeological and ethnographic heritage marked by numerous features dating since prehistory [7] (Figure 2).

Figure 2. Location of the Municipality of Jérez del Marquesado (Granada, Spain) and features of archaeological heritage (by authors from QGIS)

The intersection of the Alhorí and Alcázar Rivers in the southern, upper sector of the town yielded the Jérez River that cut the ravine. After leaving the slopes of the mountains, the ravine is boxed in between two large platforms that form part of the irrigated agricultural space. The town developed to the west while the Plain of Alcázar, the setting of the old *alquería* (village) and later quarter bearing the same name, extended to the east. Toward the center on a rocky outcrop above a meander, stands the Castle of Jérez raised in the 12th century [8].

The actions of the 'Escuela de Balates' were carried out on the slopes of the eastern slope, next to the Torre de Alcázar. This old defensive feature today forms part of the current agrarian structure made up of cultivation terraces that characterize the ravine. It bears a rectangular floor plan (7.40 x 6.90 m) oriented NE-SW with a base set on footings 25-30 cm wide. Its walls were raised with a technique specific to the area consisting of arranged masonry adorned by rows of slabs reinforced by corner ashlars and a surface plastering still preserved in certain areas. The work's upper section is adorned with numerous rows of small slag fragments [7], [9].

This tower registered as Asset of Cultural Interest (BIC) nº155 on the 29th of June, 1985, serves as an element of the identity of the Municipality. It even appears on the town's coat of arms. It likewise plays a particularly vital role in the landscape of the ravine and formed part of the old *alquería* quarter in the area called Los Caserones, only 150 m away. The locals still maintain in their collective memory its abandonment after the

expulsion of the Moriscos in 1568. It not only is significant to them at a historical level but also as a symbol of its surrounding plowed and kept terraces full of chestnut trees that formed an indivisible part of the town.

3.2. Antecedents

The actions in the Barranco de Jérez represent an attempt to recover the uses and customs of a traditional landscape without altering the environment or introducing foreign elements. As noted, the task formed part of a line of tasks of social participation and traditional practices recovery carried out by the MEMOLab-UGR. Prior ventures of this type in Jérez del Marquesado focused on recovering *acequias* of the Sierra Nevada with members of the irrigation associations, the town council, and both local and foreign volunteers. The interventions of 2018, 2019, and 2021 restored five *careo acequias* (to irrigate pastures) and established the annual clearing of many others.

The Jérez del Marquesado Municipality itself backed by various local associations launched an initiative in 2017 to regenerate and recover the Barranco de Jérez, which was suffering from neglect and deterioration. The ravine served as a great element of identity for its residents not only due to its aesthetic value and proximity, but because of its orchards and, above all, its impressive grove of centuries-old chestnut trees that are particularly attractive for recreational, gastronomic and cultural perspectives. It is also a particularly complex space, not only due to its orography accentuated by the narrow terraces that resemble flowerpots but also by the very structure of the division of the property accented by smallholding. This is especially marked by a clear distinction between elements pertaining to the *vuelo* (in the trees) and those of the *suelo* (on the ground). Thus, it was possible for a person to own a whole chestnut tree, or only part of it (a quarter, a branch...) on land belonging to a neighbor, one more feature of its Andalusian heritage. The abandonment of the area began with the emigration in the 1970s and was aggravated in the second half of the 1980s with the neglect of the *balates* (terraces), *acequias*, and the trees themselves. The trees at this time were affected by the ‘chestnut disease’ or what was known as the *tiña* (ringworm) which dried out numerous specimens, including many centenarians. Today the panorama of many areas of the ravine is bleak as, in addition to dried-out tree trunks and branches, it suffers from collapsed *paratas* or *portillos* (dry stone walls), eroded soils, thickets, and signs of aridification (Figure 3).

Figure 3. View of the Barranco de Jérez before the recovery actions (source: MEMOLab)

The city council thus contacted the MEMOLab as it had already conducted several regional participatory interventions linked to *acequias* and community archaeology through the FP7 MEMOLA project. The initiative initially benefitted from an important reception among the residents. Moreover, a team of archaeologists entrusted with the task of leading the recovery of a historically agricultural area (most likely originating between the 8th and 10th centuries) marked by a vast amount of environmental, cultural, agronomic, and social values represented an important milestone for the MEMOLab. The task nonetheless quickly became excessively complex precisely due to the intricate system of properties (notably stemming from emigration and the absence of owners and inheritors), as well as the economic challenges to the local administration.

In reality, the ravine project, despite arousing great interest, appeared to die at the moment of its inception. However, another option of intervention in the ravine sprung up as a result of a call from the Granada Provincial Council to finance archaeological projects in rural municipalities. The city council thus was given ownership of the Torre de Alcázar thus leaving the way for the MEMOLab project to be accepted. The 'Intervención Arqueológica y puesta en valor de la Torre de Alcázar, Jérez del Marquesado, Granada' ('Archaeological Intervention and valorization of the Torre de Alcázar, Jérez del Marquesado, Granada') thus served as the seed to put in place intervention in the area extending beyond the defensive feature itself and served as an incentive demonstrating the value of recovery of Jérez Barranco that had been planned years before.

3.3. Methodology: education as a tool for awareness-raising

3.3.1. Teaching the dry stone technique

The 'Escuela de Balates' dry stone walling instruction took place between January 29 and 30, 2022. More than 90 volunteers from different fields and interests participated in the recovery of the cultivation spaces around the Torre de Alcázar. The intervention was conceived as participatory and open, in line with actions previously carried out by MEMOLab *acequia* recovery. The task directly involved the City Council and the "Comunidad de Regantes" of Jérez del Marquesado who were joined by the Barranco de Alcázar Mountain Club, the Sened Cultural Association, and the 'Sened' Public School of Jérez.

One of the main objectives from the outset was the recovery of the bond of identity and rendering both the local and foreign populations conscious of how vital it is to conserve these landscapes that are not only productive but of heritage and environmental character. The project counted on local dry walling specialists dubbed *maestro balateros* to carry out the repairs and reconstructions (Figure 4). Moreover, it was they who were tasked to instruct the volunteers on the practice of this traditional craft. The work was carried out manually through traditional techniques adopting materials from the surroundings.

Figure 4. A *maestro balatero* instructing on the dry stone walling technique (source: MEMOLab)

The task required a full weekend, plus a day at the primary school of Jérez del Marquesado. It counted at all times on four *maestros balateros* as well as other individuals with a greater or lesser knowledge of the technique. On the first day, the volunteers were formed into three groups working on the *paratas* (walls) and another on the acequia that had once channeled water to the terraces (Figure 4). On the second day, work focused on the walls and the regeneration of the soil.

The project not only rebuilt four of the ravine's cultivation terraces, but a section of the Alcázar *acequia* that irrigated them. In addition, the soils were cleared and regenerated, and autochthonous fruit trees were planted. The impact of the work can be clearly perceived from the town on the other bank of the ravine. The area thus changed in appearance and recovered part of its values (Figure 5).

Figure 5. Before (left) and after (right) views of the recovery project of the Barranco de Jérez (source: MEMOLab)

The recovery of the space initially required repairing the *portillos* around the tower. The *portillos*, a term specific to the Municipality of Jérez del Marquesado, are the retaining walls of the terraces fashioned by the dry stone technique. The stones serving for the task were local: notably chloritoid schists from the Nevado-Filábride complex. These were for the most part small rolled river slabs and pebbles from the zones of contact between the metamorphic environments of the slopes and those of sedimentary nature from the plain and ravines. In certain cases, the entire *parata* had to be rebuilt whereas others only required repairing the cracks, reinforcing or eliminating the bulges, and crowning. The action was applied to a total of 56.74 linear meters of wall.

Raising new dry-stone walls (Figure 6a) required manually digging a foundation trench with picks and hoes. Once dug the trench received a first course of larger stones intended to offer better support. A string line guide ensured the correct alignment of the ensuing rows. The wall was thus raised little by little, locking and fitting the stones one by one. This sort of ‘trial and error’ process consisted of testing stones until identifying the best suited for each position. It was key that the rows of stones be well interlocked, leaving as few gaps as possible. Smaller stones called *ripios* (gravel) served as fillers and wedges (Figure 6b). The great height of one of one case rendered it necessary to design a setback (known as *balate* and *contrabalate*) to give more solidity to the structure (Figure 7).

Figure 6a. Dry stone terrace wall (*portillo* or *parata*) reconstruction work (source: MEMOLab)

Figure 6b. Dry stone terrace wall (*portillo* or *parata*) reconstruction work (source: MEMOLab)

Figure 7. High dry stone terrace wall (*portillo* or *parata*) with a setback after reconstruction (source: MEMOLab)

Furthermore, as noted, the task also included restoring a section of the *acequia* supplying water to all these terraces that suffered from partial clogging, and collapse and was overgrown with weeds. The task focused on 260 m of its course including a segment partly raised by a *parata* and another bypassing the base of the Torre de Alcázar. The action was cut short a little before the medieval tower to prevent humidity from damaging its structure.

Certain fills of these cultivation terraces had to be recovered after constructing the dry stone walls as erosion had eliminated at times both the upper fertile soil and part of the substrate. The earth serving to refill these terraces was spoil removed during the archaeological excavation of the "Torre de Alcázar" of September 2021 which was left for this purpose (Figure 8).

Figure 8. Transporting soil to refill the cultivation terraces (source: MEMOLab)

3.3.2. Planting autochthonous trees

Using the educational activities organized by the MEMOLab such as “Aprender a ser científico con el regadío histórico” (Learn to be a scientist through historical irrigation), it is possible to confirm that historical water management systems and Cultural Landscapes generate curiosity among the young, and thus foster their interest in their environment. This also bolsters an awareness and sensitization of these spaces and recognition of the necessity of preserving the local traditional knowledge they offer [11]. The youngest (and not only them) have now become aware of the importance of grasping how these systems work and their use by their family and closest friends. These activities, often perceived as a game by the young, thus promote the transmission of knowledge and values of intergenerational tradition.

In the case of this proposal, we were able to count on the participation of 21 pupils from the SENED Rural Public School of Jérez del Marquesado aged between 7 and 11, the youngest being the protagonists. The aim was to create a link between the ravine and these young inhabitants of the town who had never seen or experienced the chestnut grove or the cultivation area in all its splendor. Moreover, in many cases, due to the abandonment and marginalization of traditional production systems, these students were unaware of the traditional techniques that had given rise to these productive spaces (Figure 10).

The first step of this task consisted of an introductory session highlighting the key role of historical irrigation systems through animated audiovisuals raising the following questions: *What are traditional irrigation systems?* [4] and *why are traditional irrigation systems important?* [5]. The session also explored the nature of planting native fruit trees as well as the value of preserving the space. They then were divided into groups and given tools to plant chestnut and rowan trees that had been previously collected from various surrounding areas by the “Comunidad de Regantes” (Figure 11). Ditches were dug to guide water to the trees allowing the students to view the entire irrigation process on each of the terraces in the company of members of the irrigation association (Figure 12). Each tree was then given a name and the students pledged to care for them, actions that strengthened their bond with the trees and the environment. Each tree was later surrounded by a mesh to protect it from animals and the town hall committed itself to maintain and water them in the framework of the space assigned to the intervention of the Torre de Alcázar and its surroundings.

Figure 10. Introductory session with students of the CPR SENED primary school (Jérez del Marquesado, Granada) (Source: MEMOLab)

Figure 11. Planting and protecting chestnut and rowan trees by students of the CPR SENED primary school (Jérez del Marquesado, Granada) (Source: MEMOLab)

Figure 12. Irrigating the chestnut trees (Source: MEMOLab)

During the days after the planting, the teaching staff and students made drawings depicting how they imagined the Barranco de Jérez to appear in a few years, with grown trees and the ravine returned to its previous state (Figure 13).

Figure 13. Drawing of the Barranco de Jérez by one of the students of the CPR SENED primary school of the Barranco de Jérez (Source: CPR 'Sened', Jérez del Marquesado)

4. Discussion

The participatory recovery of the Barranco de Jérez is undoubtedly a very enriching process involving the local community in the reconstruction of a historical space valued by the residents of Jerez. It is not the first experiment of its type. Dry stone constructions bear a series of intrinsic characteristics that render them of special interest to participatory and communal work. It must nonetheless be taken into account when planning this type of activity that it is a difficult task. As noted above, other similar experiences were undertaken by work camps by local associations and environmental volunteers to rebuild different types of dry stone constructions. Worth highlighting are those collected in the publication "Guías prácticas voluntariado ambiental: Construcción en piedra seca" (Practical guides to environmental volunteer work: dry stone construction) by Antonio Camacho [10]. An example is the activities of 2005 and 2007 by the Favencia Youth Association of the Sierra Nevada, the Sierra Nevada National Park, and the Sierra Nevada Natural Park to reconstruct shepherd huts in Doña Mencía (Córdoba) [10, p. 60]. Another case is that of the Municipality of Lanjarón, through the network of environmental volunteers of the Sierra Nevada, to rebuild two *albarradas* (large drystone walls) as part of the recovery of the 'Barranco Tornacano' [10, pp. 61–62]. Furthermore, the Association of Friends of the Sierra Mágina Natural Park constructed from 2006 to 2008 a series of *hormas* (*paratas* or *portillos*) and stone huts to combat slope erosion [10, p. 63]. There are other examples beyond Andalusia such as a La Fatarella (Tarragona) where the Fundación el Solá organised the building of dry stone walls by an international work camp in 2007

to improve a trail. Interventions of this type in many cases have continued over time involving local populations, associations, and public bodies [10, p. 64].

To verify the effectiveness of the recovery and evaluate the results this study developed a survey entitled Perception of the dry-stone technique of the 'Escuela de Balates', Jérez del Marquesado (Granada). Its objective was to obtain quantitative and qualitative data to discuss and propose potential improvements to these types of future actions. A compelling query was intended to determine if the participants were acquainted with the dry stone walling. Surprisingly, 66.7% of those surveyed responded negatively (while 33.3% positively). Therefore, the 'Escuela de Balates' not only contributed to reconstructing certain structures of traditional agricultural spaces but also to disseminating ancestral knowledge that stretches throughout the rural areas of the Mediterranean.

All those surveyed agreed on the importance of maintaining and recovering traditional knowledge and cultivation spaces. They likewise coincided with the need to preserve the identity of the local community by practicing these traditional techniques, understanding the relationship of the population with its environment, promoting food sovereignty and the resilience of territories, and solving environmental problems such as the loss of soil. Those surveyed also highlighted the scope, effectiveness, and coordination of communal work, as well as the importance of intergenerational transmission of traditional knowledge.

A video entitled Escuela de Balates a piedra seca (MEMOLab) summarising the activity was uploaded to YouTube to help in transmitting the processes of recovery of cultural heritage to society. Dissemination of the participatory process and the results through social networks is essential to involve society, and swiftly and simply present scientific findings. It is for this reason that the communication strategy of the MEMOLab not only feeds its own media but also other local and regional entities and groups and the press.

The 'Escuela de Balates' as a tool of social intervention, similar to the recovery of *acequias*, not only offers great potential but is multifaceted and multifunctional. After attaining the primary objective of restoring a minute sector of this historical agricultural space, the project also contributed to the dissemination and awareness of patrimonial, cultural, landscape, environmental, agronomic, and social values that form part of a multitude of aspects of a recovery process - or that the recovery attempts to approach. The project provoked a debate as to the need and the possibility of recovering the *barranco*, a notion raised years before. Accomplishing it thus reveals that it is possible to carry this out through very simple and inexpensive means and that communal efforts allow undertaking a task that is almost impossible to assume individually.

5. Conclusions

The participatory project presented in this paper repaired a cultivation space that had been totally abandoned for about 40 years. The action restored not only a number of the dry stone walls of the cultivation terraces but reinstated irrigation through the Alcázar *acequia*. It also reconstructed the aspect the area might have formerly had by planting 20 new chestnut and a dozen rowan trees and recuperating many others that were practically lost through irrigation and pruning.

The recovery and subsequent clearing of a section of the main *acequia* in MEMOLab's campaign of 2022 led the *acequia* of Alcázar to be designated as part of the historic irrigation systems valorized by a cultural itinerary within the framework of the INCULTUM project (INnovative CULtural ToUrisM in European peripheries). This project related to innovative and sustainable cultural tourism aims at establishing an itinerary using the service road crossing the historic *acequias*, always taking into account the traditional knowledge harbored by irrigation associations as well as the ecosystem services offered by these structures.

This activity, framed within environmental and cultural volunteerism, contributed to improving the surroundings while simultaneously maintaining the cultural and ethnological legacy of rural areas. This all derives from a case of Participatory Archaeology involving the local population in all the different steps. Of essence was encouraging citizen involvement, favoring creating a sustainable social and economic fabric,

advancing proposals of alternative development, and improving of governance, territorial planning, asset management, etc. In other words, the goal strived to achieve a real and positive impact on the life of the communities and their territory, always through an integrated, long-term approach. The results are impressive and highly remarkable as they have led to the rebuilding of a series of destroyed *balates* and recovering a rural, agrarian, cultural, and historical heritage in need of preservation.

Recovering this knowledge is essential not only due to its heritage significance, but also because it has proven to be highly sustainable and resilient, and in most cases is scientifically valid. The construction and management of cultivation terraces are not only linked to water and all its ramifications but to soil, levels of humidity, vegetation, and the microecosystems generated by dry stone walls. The socio-ecosystems that form the basis of Cultural Landscapes thus stem from highly profound historical co-evolutionary processes. As highlighted in this study, they have proven to be enormously sustainable and resilient over generations, and have generated landscapes teeming with cultural, social, productive, environmental, and aesthetic values that not only represent an enormous capital but are key to guaranteeing future species.

Funding

'Escuela de Balates': Transmission and dissemination of traditional dry stone construction techniques are part of the project "IRIS: Inspiring rural heritage: sustainable practices to protect and conserve upland landscapes and memories" (REF PCI2020-112195), funded by MCIN/AEI/10.13039/501100011033 and by the European Union "NextGenerationEU"/PRTR".

It is also framed in the 'INnovative CULtural ToUrisM in European peripheries' (INCULTUM) project funded by the European Union's HORIZON 2020 research and innovation program under grant No. 101004552 stemming from the call 'Innovative approaches to urban and regional development through cultural tourism' (https://incultum.eu/).

Acknowledgments

We want to thank the City Council of Jérez del Marquesado, the Comunidad de Regantes of Jérez del Marquesado, the Barranco de Alcázar Mountain Club, and the Sened Cultural Association for their collaboration in carrying out the 'Escuela de Balates'. We especially recognize the participation of the local and foreign volunteers, the management team, and the students of the SENED Rural Public School for their role in planting the trees.

References

[1] L. Delgado Anés, "Gestión, comunicación y participación social en los paisajes culturales de Andalucía: El caso del Proyecto MEMOLA," Universidad de Granada, 2017.

[2] S. Martos Rosillo *et al.*, "Recuperación de sistemas ancestrales de manejo del agua que utilizan soluciones basadas en la naturaleza. Las acequias de Jérez del Marquesado (Granada)," in *XI Congreso Ibérico de Gestión y Planificación Del Agua*, 2020, pp. 349–369.

[3] F. Criado-Boado and M. González Méndez, "La puesta en valor del Patrimonio arqueológico desde la perspectiva de la arqueología del paisaje.," in *Conservación Arqueológica. Reflexión y debate sobre teoría y práctica*, Conserjería de Cultura y Medio Ambiente. Junta de Andalucía. and Instituto Español de Arquitectura, Eds. 1994, pp. 76–104.

[4] MEMOLAproject, "What are traditional irrigation system?," 22-Dec-2017. [Online]. Available: https://www.youtube.com/watch?v=YGekmwjodxk. [Accessed: 15-May-2024].

[5] MEMOLAproject, "Why are traditional irrigation system important?," 22-Dec-2017. [Online]. Available: https://www.youtube.com/watch?v=-IfiDn8TUCI. [Accessed: 15-May-2024].

[6] R. Ruiz Pérez, *Granada en tus manos: Guadix y su Comarca*. 2006.

[7] J. M. Martín Civantos, *Poblamiento y territorio medieval en el Zenete (Granada)*. 2007.

[8] J. M. Martín Civantos, "Arqueología y recursos naturales: notas para la Arqueología del paisaje," in *Medio ambiente y arqueología medieval*, no. 12, J. M. Martín Civantos, Ed. Nakla. Colección de arqueología y patrimonio, 2008, pp. 17–40.

[9] M. Martín García, J. Bleda Portero, and J. M. Martín Civantos, *Inventario de Arquitectura Militar de la Provincia de Granada (siglos VIII-XVIII)*. Granada: Diputación de Granada, 1999.

[10] A. Camacho Mesa, *Construcción en piedra seca. Guía práctica de voluntariado ambiental*. Sevilla: Consejería de Medio Ambiente. Junta de Andalucía, 2008.

[11] J. M. Martín Civantos, E. Correa Jiménez, M. T. Bonet García, and M. Toscano, "Aprender a ser científic@s con el regadío histórico," *Rev. UNES. Universidad, Esc. y Soc.*, vol. 12, no. 12, pp. 87–100, 2022.

This page intentionally left blank