

Rural Infrastructure Using Dry-Stone Walling, an Asset for Sustainable Development in a Regional and Local Context [†]

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[†] Presented at the 17th International Conference of the Hellenic Association of Agricultural Economists, Thessaloniki, Greece, 2–3 November 2023.

Abstract: In this study, dry-stone walling was assessed by the public to map perceptions on the recognition, durability, appeal, food production aspects, biodiversity advocacy, and other characteristics and functions of dry-stone walling. The survey's goal was to define how informed the public is about the functions performed by dry-stone walling. The answers were expected to reveal whether the returns of dry-stone walling are widely acknowledged by the public, what the key factors are for the dissemination of these profits, and if there is solid ground for the reintroduction of dry-stone walling as a cutting-edge choice for new projects.

Keywords: sustainability; dry stone; rural; agri-food; landscape; natural resources; environmental protection; local economy



Citation: Stathopoulou, E.; Theodoropoulou, E.; Rezitis, A.; Vlahos, G. Rural Infrastructure Using Dry-Stone Walling, an Asset for Sustainable Development in a Regional and Local Context. *Proceedings* **2024**, *94*, 53. <https://doi.org/10.3390/proceedings2024094053>

Academic Editors: Elias Giannakis and Stavriani Koutsou

Published: 20 February 2024



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1. Introduction

In view of the growing interest in sustainability and the related challenges that need to be addressed, rural areas play multiple roles with interweaving and often conflicting functions (Guštin et Slavič [1]); they are food providers, keepers of biodiversity and natural resources, economic components, social cohesion buffers, and cultural treasuries. To motivate synergies that can promote sustainability, it is important to make the most of opportunities, reconcile conflicts, and address challenges in a positive way. We need to be innovative, resourceful, and willing to examine new solutions, but we should also note the possibilities and context of reintroducing longstanding and effective solutions.

As such, dry-stone (DS) building (building without the aid of mortar) is an asset, mainly in rural areas, that conveys the identity of a place, as in the past, it supported a range of agricultural and community infrastructure (Allport, [2]). The technique has produced elements that have shaped landscapes and facilitated the interrelation of humans with the natural environment through the development of culture and socioeconomic organization. It represents the anonymous rural builders who combined their efforts, intelligence, and expertise to create amazing infrastructure that was fully integrated in the natural environment.

Mediterranean landscapes are characterized by DS walling, where the construction of terraces allowed the transformation of steep terrains into highly productive agricultural land (Druguet, A. [3]). The use of DS walling also supported a whole range of agricultural and community infrastructure, such as field boundaries, livestock amenities, supportive huts for storage and shelter, threshing floors, mills, irrigation canals, retaining walls, bridges, housing, and more. Cultural changes resulted in the abandoned and rapidly forgotten DS walling technique since the knowhow was transmitted orally and through observation and experience according to the special characteristics of each area. (Pagratiou, [4])

Nowadays, dry-stone walling is recognized as an important cultural element of rural communities (UNESCO, [5]) and an excellent example of optimizing natural and human resources (Picuno, [6]); however, it is not confined to that. Due to the technique, the produced infrastructure offers a wide range of advantages for the environment, the biodiversity (Manenti, [7]), the development of socioeconomic capital through culture (Rose, [8]), local jobs (HISTORIC ENGLAND, [9]), and rural tourism (Grefe, [10]).

The scientific community acknowledges the environmental, sociocultural, aesthetic, and economic value of DS walling, which therefore integrates all three aspects of sustainability. Consequently, DS walling—although marginalized in the past—is becoming more relevant in accordance with the 2015 United Nations action plan “Transforming our World: the 2030 Agenda for Sustainable Development” (COUNCIL OF EUROPE, [11]).

It is of interest to systematically examine the sustainability aspect of DS building and the advantages it can produce for local and regional sustainable development. The identification of the whys and wherefores of DS walling will provide a thorough understanding on the benefits that can be produced and the potentials that emerge, aiming to provide insights on opportunities and restrictions as well.

On this basis, in this paper, dry-stone walling capital was assessed by the public to map perceptions on the recognition, durability, appeal, food production aspects, biodiversity advocacy, and other characteristics and functions of DS walling. The objective of this work was the pilot-phase implementation of an upcoming questionnaire survey, and we intended to check the questionnaire for structural failures and weaknesses in the utilization of the information it produced. The pilot survey was implemented in a small scale; however, some interesting findings were noticed regarding the public perceptions of DS walling. The answers to the future survey are expected to reveal whether the returns of the DS capital are widely acknowledged by the public, what the key factors are for the dissemination of these profits, and if there is solid ground for the reintroduction of DS walling as a cutting-edge choice for new projects.

2. Methods

The survey was quantitative; the data were collected through an Internet questionnaire survey (Google Forms) and analyzed using SPSS 22.0. The target group consisted of individuals older than 16 years old that lived in Greece. In total, 132 participants self-administrated the closed-format questionnaire between 3 March 2023 and 27 March 2023. Due to the pilot character of the survey at this stage, focus was not set on the composition of the sample, which resulted in imbalances that were expected. For the measure of rank correlations, Spearman’s correlation coefficient was used. To investigate whether there was a statistically significant difference between the means of two independent groups, the non-parametric Mann–Whitney U rank test was used.

3. Results and Discussion

The research analyzed data collected from 132 participants whose main characteristics are summarized in Table 1. Most of the participants regarded most features of rurality, such as nutrition and health, culture, recreation, and environmental protection, as moderately important. Regarding DS walling recognition, 49.2% of the respondents claimed to be aware of DS walling; however, up to 62.1% of them chose the correct definition of DS walling when asked.

The main fields in which the importance of DS walling is highly acknowledged are culture, natural resource depletion, and resilience/durability. It is important to note that significant features of dry-stone walling did not appear to be highly accredited. Its role in landscape, biodiversity, tourism, and local development was most often stated of to be of fair importance.

Table 1. Sample characteristics.

Characteristic	Percent
Women	63.6
Age 40–49	48.5
University, Polytechnic, master’s degree	48.4
Employed in the private sector	35.6
Scientific and technical professional experience	32.6
Residents of urban areas (over 2000 residents)	94.7
Apartment-dwellers	54.5
Rare visitors of rural areas (3–6 times per year)	37.1

As for attitudes towards the adoption of DS walling in new private constructions, 71.8% of the respondents were in favor mainly due to the aesthetic value of the construction, the use of ecological material, and its resilience/durability over time, while biodiversity advocacy was a key factor for only 28.4% of them. Interestingly, as far as public constructions are concerned, approval reached 78.3% among the individuals, while case resilience/durability was not so highly considered, and the biodiversity factor seemed to gain impact when the public space was considered (42.3%).

The main types of construction preferred by individuals mainly regarded enclosures and elements such as benches, water features, etc.; however, for public constructions, it is interesting that bigger-scale interventions were highly preferred. These include the incorporation of DS walling in the design and development of open public spaces and building surroundings, as well as the layering of surfaces.

Concerning the willingness to pay for the assignment of dry-stone walling, 75.8% of the respondents preferred DS over another type of construction, if it would not cost more, with only a small amount of the respondents being willing to pay up to a maximum of 20% more for this.

Furthermore, age is a significant factor that affected the participants’ opinions regarding the importance of DS walling over various criteria. Older individuals expressed more positive opinions regarding the criterion “In favor of the landscape”, “Biodiversity advocacy”, and “Use and reuse of natural resources and the avoidance of environmental pollution” ($p < 0.05$).

Additionally, the type of area of the respondents’ main residence is a factor that differentiated their opinions regarding the importance of DS over various criteria; in particular, citizens whose main residence was in a rural area expressed more positive opinions regarding the criterion “Durability and endurance over time” than citizens whose main residence was in an urban area ($p < 0.05$).

4. Conclusions

In conclusion, our main results indicate that DS walling branding is not especially strong, although the particularity of the technique (the absence of mortar) is well identified, maybe because of the name itself. As a practice of the past, it plays an important role in terms of tradition, which can be beneficial but also confining. Perceptions over the significance of DS walling do not highly acknowledge important components and synergies that are involved, such as the impact on the landscape and the connection with tourism, the protection of biodiversity, and the promotion of local masonry jobs, although the Mediterranean landscape is characterized by agricultural terraces and other DS constructions.

This points out the necessity of promoting DS branding to increase recognition and raise awareness of the profits that DS walling can provide locally, at an environmental as well as a socioeconomic level. Additionally, older participants were more aware of the beneficial role that DS walling plays in various criteria for sustainability, while residents of rural areas had a better understanding of the fact that DS walling is a competent, long-lasting choice for construction. It seems that there is a gap in information and awareness, possibly due to alterations in lifestyle and urbanization. Nowadays, more people, and

especially younger individuals, are more detached from rurality, resulting in the loss of valuable tools that can be important assets for development.

Nevertheless, DS walling is generally highly accepted as a choice for contemporary works, especially in public spaces, which perhaps also pinpoints a need to differentiate construction methods because of the uprising concerns over the environment and the consequences of climate change. In this respect, rebranding DS walling as a modern choice would empower recognition and the diffusion of the rewards to a much wider audience. Supposing that DS walling costs more than the alternatives, cost may be an issue. In this case, subsidies for the extra cost could be necessary to support the maintenance of existing DS structures before they become ruins and to further develop dry-stone walling capital with the implementation of new works. This fact seems to be recognized by policy makers, since specific Rural Development Policy measures are supporting such endeavours.

Overall, DS walling is a multidimensional asset that provides benefits to all aspects of sustainability. Although it is a traditional practice, DS walling still could address present and future concerns; thus, it is crucial to ensure the survival of the traditional technique. While environmental and socioeconomic crises are becoming more common globally, there is considerable skepticism about the choices that have been made. In this setting, DS walling seems to have the dynamics for a comeback that would produce opportunities for local and regional development.

Author Contributions: All the authors, E.S., E.T., A.R. and G.V., have contributed equally to all stages of the paper. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data are contained within the article.

Conflicts of Interest: The authors declare no conflict of interest.

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