

Dehesa: A Systematic Literature Review to Assess Its Potential in Romania

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Abstract

Keywords: *dehesa, biodiversity, literature review, agroforestry*

This study systematically reviews the potential of the dehesa agroforestry system for adaptation to Romania's climate and agricultural landscape, addressing both environmental and social sustainability. The dehesa, widely implemented across Spain and Portugal, integrates holm and cork oak trees with grazing and traditional farming practices, promoting biodiversity and offering a low-impact, high-diversity model adaptable to climate variability. Given the environmental pressures from Romania's industrial agriculture and habitat loss, this study synthesizes findings from 151 articles on dehesa systems, narrowing them to 11 key studies. The review categorizes findings into two primary themes: environmental benefits, such as enhanced microclimate stability, soil carbon sequestration, and reduced greenhouse gas emissions, and the perceptions of diverse stakeholders—including farmers, consumers, and policymakers—toward sustainable agroforestry. Environmental findings underscore dehesa's role in lowering temperatures and increasing soil water retention, which could mitigate Romania's summer droughts. Socially, stakeholder engagement highlights a robust interest in sustainable land-use practices. These insights provide a framework for integrating traditional agroforestry with contemporary agricultural policies, fostering sustainable agricultural practices in Romania.

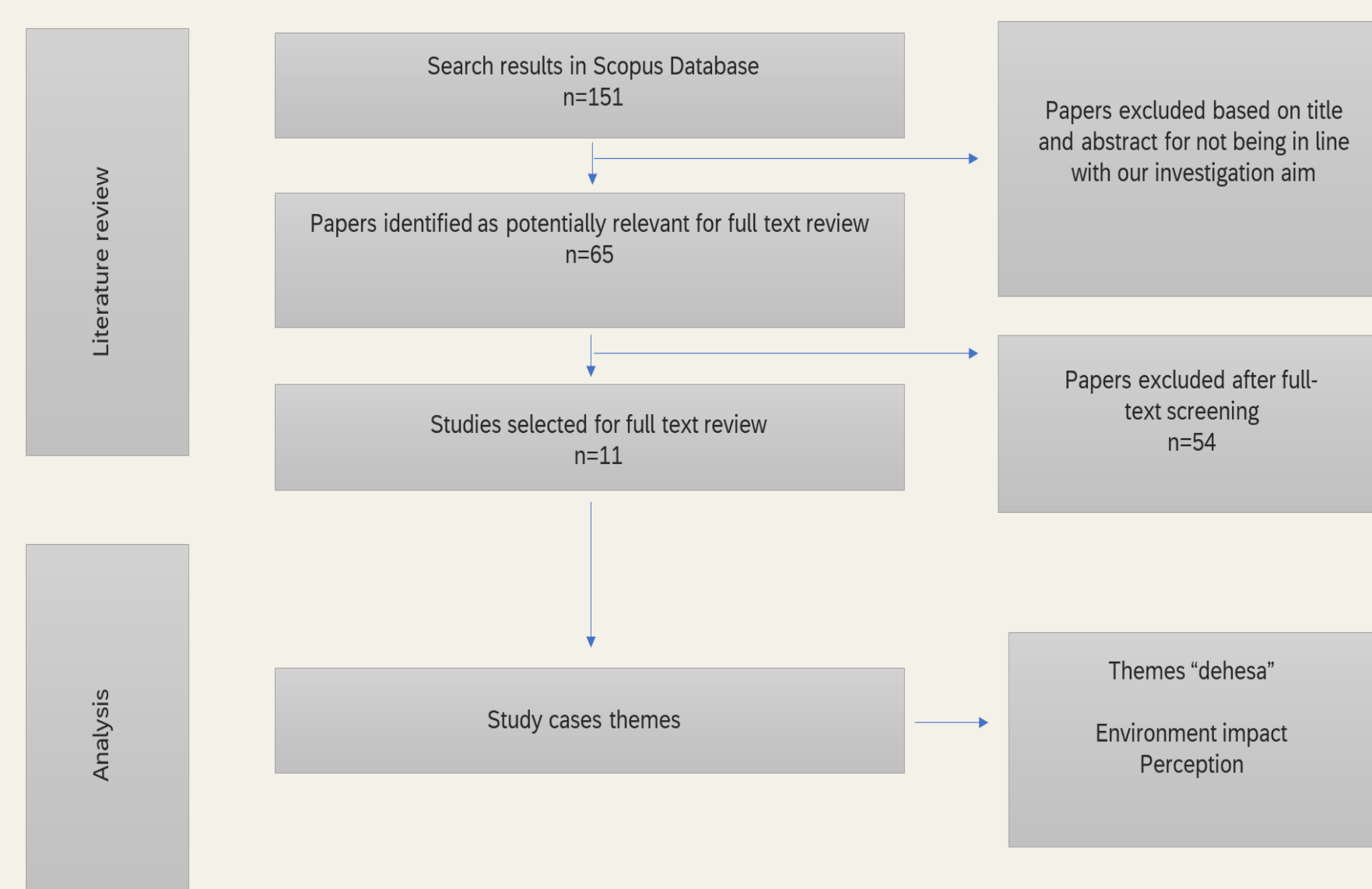
Introduction

The effects of climate change have intensified in recent years, causing academics to pay closer attention to environmental problems and solutions. It is commonly known that discussions about returning to old traditions and fusing them with contemporary technologies are frequently brought up while considering environmentally friendly techniques (Amundson, 2022; Snow, 2020; Sumberg, 2022). The idea of returning to tradition in agriculture is hotly discussed because this industry is responsible for ensuring food security while also operating within the constraints of the earth. Although maintaining food security should remain a top priority, researchers and experts are working to delve deeper into the traditional, old methods. One of the practices well studied is dehesa seen as a traditional, vast, low-input agroforestry system made up of holm oak (*Quercus ilex*) and cork oak (*Quercus suber*)

with open, diverse canopies and a shrubby, annual herbaceous understory (Ivezic et al., 2021). There are roughly 2.3 million hectares of dehesas in Spain and 0.7 million hectares of "montados" in Portugal (Moreno and Cáceres, 2016). As a result, the current study's objective is to systematically analyze the literature to provide a snapshot of the dehesa system, originated from Spain, its benefits and applicability for Romania.

Methods

A three-step methodology from Tranfield, Denyer, and Smart (2003) and Merli, Preziosi, and Acampora (2018) was used in the research. The first stage is to create the procedure and decide on the study question or subject. The applicability of dehesa system is the subject of this paper's investigation. The search was carried out in the second step, with a focus on study selection, extraction, and synthesis. And, finally, the interpretation of the results categorized by themes. All the steps are illustrated in the following figure.



Framework for selecting the papers from Scopus database
Source: Created by authors based on the methodology

Results

"Dehesa*" was searched in title, abstract and keywords, in Scopus database. Then the results were limited to agriculture, environment and earth and planetary sciences as subject area, from publication stage final status was chosen, document type was set to article, keyword – dehesa, and source type journal. This resulted in 151 articles for the review. The review was done in two steps, first step consisted in abstract review and during this step 65 papers were excluded. The second step consisted in full text review where a number of 54 papers were removed as their focus was not in line with our paper aim. Finally, 11 papers were selected for an in-depth review. For the final review, a form was created to capture all the relevant information such as: methods, study case findings, and proposals for future research from the authors.

The topic was approached from different perspectives by researchers, some of them focused on the practicability of the dehesa system while others focused on the involved actors (e.g. consumers, farmers, specialists) perception of the system. This made easy to split the themes found in the literature into two categories: environmental impact and different actors' perception of the system.

Dehesa findings



Dehesa clusters
Source: Created by authors based on the findings

The findings suggest a positive effect of dehesa seen in practice through the benefits to the environment but also a positive perception of all actors regarding the system (Mhatre et al., 2021). The results are synthesized in the scheme 2 – Dehesa findings.

Conclusion

The literature review regarding dehesas, classified as a "high nature value" farming system, illustrates how traditional Mediterranean land management practices have fostered a social-ecological system distinguished by a robust diversity of participants, practices, biodiversity, and ecosystem services. Moreover, the findings underscore the increasing importance of dehesas for cultural identity in Spain and their role in nature conservation, particularly in light of the values and expectations of a more urbanized society. Researchers have emphasized the environmental benefits of the Dehesa or agroforestry system, their results noting its potential to address several ecological challenges in Romania as well, such as drought and extreme summer temperatures. The southern parts of the nation, which have been severely affected by deforestation, may benefit most from this approach. The Dehesa system offers a variety of ecosystem services that could help local residents, especially in terms of recreational activities and environmental sustainability, in addition to providing a safe habitat for wildlife.