MANAGING AGRICULTURAL LAND AND LANDSCAPE IN THE ISLANDS: CHALLENGES AND STRATEGIES

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1. Introduction to Agricultural Land

Agricultural land refers to any land used for agricultural activities, including cultivation, grazing and other farming uses. It is a non-renewable natural resource that requires protection to ensure the sustainability of farming practices and food production. Agricultural land is crucial for Greece's socio-economic sustainability, covering 30% of the country's total area, with arable crops, permanent crops, and horticultural land as the main uses (Paschalidis et al., 2021).

According to the Greek Ministry of Rural Development and Food, High-Productivity Agricultural Land (HPAL) refers to areas distinguished by exceptionally high productive capacity, attributed to factors such as soil quality, microclimate, and other natural resources. These areas are legally protected from land-use changes, including urban development and other non-agricultural activities, to preserve their agricultural function and sustainability (Ministry of Rural Development and Food, n.d.).

Thus, the Greek Ministry considers only High-Productivity Agricultural Land (HPAL) worthy of protection. However, we argue that the sustainable management of all agricultural land, rather than solely HPAL, is fundamental for territorial cohesion, the preservation of cultural heritage within local communities, and the promotion of sustainable development. A broader approach to agricultural land management is essential for ensuring environmental quality, cultural heritage conservation, and social well-being (Fazekaov, 2012; Kuzmich, 2022). This article further aims to explore the role of landscape as a multidimensional conceptual tool for protecting high-value agricultural land, integrating landscape-based methodologies into spatial planning, and enhancing sustainability within the framework of the European Landscape Convention (ELC).

2. Legislative Framework on High-Productivity Agricultural Land in Greece

The existing legislative framework concerning HPAL in Greece primarily addresses construction regulations and photovoltaic (PV) installations, without providing a comprehensive approach to broader land-use and environmental considerations. Over time, legislative amendments have introduced exceptions and allowances, often prioritizing economic interests over the long-term sustainability of agricultural landscapes.

2.1. Construction Regulations

The legal provisions governing construction on HPAL have evolved, gradually allowing for specific exemptions to the initial strict protection measures:

- Law 2945/2001 establishes that "any activity other than agricultural exploitation is prohibited" on designated HPAL.
- Law 3399/2005 introduces an exemption, excluding land within 600 meters of provincial road axes from HPAL classification.
- Law 4178/2013 further relaxes restrictions by permitting construction and building permits for properties within HPAL, provided they have frontage on national, provincial, or municipal roads or are located within 200 meters from the axis of national and provincial roads and 150 meters from the axis of municipal roads.
- Law 5087/2024 reinforces HPAL protection by mandating continued agricultural activity and requiring a study to define the plant species and cultivation conditions for the land in question.

2.2. Regulations on Photovoltaic Installations

Despite the formal protection of HPAL, legislation has progressively allowed for the installation of photovoltaic stations, subject to certain limitations:

- Law 3851/2010 permits PV installations on HPAL, restricting their total coverage to no more than 1% of the total cultivated land in each regional unit.
- Joint Ministerial Decision (JMD) ΥΠΕΝ/ΔΑΠΕΕΚ/74123/2971/2020 (Government Gazette 3149/B/2020) allows PV stations up to 1 MW on HPAL, maintaining the 1% cap, except in Attica and the islands, where the limit is 0.5%.
- JMD ΥΠΕΝ/ΔΑΠΕΕΚ/104605/4389 (Government Gazette 5342/B/2022) reduced the threshold in October 2022, setting a 0.8% limit for mainland Greece, while keeping the 0.5% restriction for Attica and the islands.

The scope of legislation remains narrowly focused on construction and photovoltaic installations, largely disregarding broader agricultural, environmental, and landscape concerns. While HPAL is granted legal protection, the emphasis is placed on intensively cultivated land, overlooking high-nature-value agricultural systems such as low-intensity cropping, pastures, and agroforestry areas. As a result, the regulatory framework reflects a prioritization of economic activities over a holistic approach to agricultural land management, failing to recognize the ecological and cultural significance of diverse agricultural landscapes.

2.3. The Only Comprehensive Legislation on HPAL

Apart from construction and PV-related regulations, the only legislative framework explicitly classifying and assessing HPAL is Joint Ministerial Decision 168040/2010 (Government Gazette 1528/B/2010). This decision classifies agricultural land into productivity categories based on two types of criteria:

- Productivity criteria:
  - Presence of irrigation or existing (or planned) land consolidation projects.

- Environmental criteria:
  - Formation of natural units with local characteristics and multiple uses.
  - Traditionality and uniqueness of crops, special soil composition.
  - Insularity, recognizing the specific role of agricultural land on islands.
  - Proximity to protected areas (e.g., NATURA 2000).

This framework attempts to prioritize land protection based on both productive potential and broader spatial, social, ecological, and cultural values. However, even the wording of the Joint Ministerial Decision reflects a bias toward productivity criteria, emphasizing economic considerations over environmental and cultural significance. Notably, one year later, proximity to protected areas was removed from the list of criteria, weakening the framework's environmental safeguards. Furthermore, while areas meeting productivity criteria are clearly defined, no official delineation exists for environmental criteria, making them impractical to implement and easy to overlook.

The evolution of legislation regarding HPAL indicates that legal protection remains limited and conditional, with a strong bias toward economic productivity. While regulatory measures exist, they primarily focus on intensively cultivated land, construction allowances, and renewable energy development, largely neglecting high-nature-value agricultural systems, such as low-intensity cropping, pastures, and agroforestry areas. As a result, land-use policies fail to integrate a holistic perspective, prioritizing short-term economic gains over long-term environmental sustainability, cultural heritage preservation, and landscape resilience.

3. Effectiveness of Protection of Agricultural Land

Agricultural land in Greece is undergoing significant transformation, with vast areas being converted into urban land. This process not only affects agricultural production but also disrupts biodiversity and the cultural heritage associated with rural landscapes. The loss of meadows and shrublands, areas that are often used as pastures, exacerbates the degradation of the rural environment, particularly on the Greek islands, where agriculture has long been a cornerstone of local economies and cultural practices.

The Greek rural landscape is under attack from a variety of multi-dimensional threats, which collectively contribute to the decline of agricultural spaces. The major forces reshaping the rural environment include:

1. *Urbanization*: The expansion of real estate development, including the rise of second homes and various constructions, leads to the rapid conversion of agricultural land into urban areas (Stathakis, and Baltas, 2024; Zambon, et al, 2018). This not only reduces land available for agriculture but also fragments ecosystems (Salvati, 2016).
2. *Industrialization and Land Grabbing*: The increasing demand for industrial development and land grabbing often results in the exploitation of rural areas for non-agricultural purposes. Pollution from industrial activities and the uncontrolled installation of industrial wind parks and photovoltaic systems on agricultural land lead to unfavourable consequences for local communities and the environment (Kati et al, 2023; Siamanta, 2019).
3. *Touristification*: The rapid growth of mass tourism in many Greek islands has intensified the pressures on rural spaces. While tourism brings economic benefits, it also leads to the over-exploitation of land for tourist facilities, transforming

agricultural land into tourist infrastructure, thus reducing the capacity for food production and local sustainability (Sarantakou & Terkenli, 2019; Lagarias et al, 2023).

4. *Erosion, Land Degradation & Desertification*: Soil erosion, land degradation, and desertification are significant challenges facing Greek agricultural land, particularly in areas exposed to overgrazing and poor agricultural practices. These processes contribute to the decline of land quality, affecting agricultural productivity and ecological resilience (Cherif et al, 2023; Paschalidis et al., 2021)
5. *Climate Change and Poor Protection Measures*: Climate change exacerbates existing vulnerabilities, contributing to more extreme weather events, such as droughts and floods, which negatively impact agricultural productivity. The ineffective implementation of protection measures, combined with a lack of comprehensive land-use planning, further undermines the sustainability of agricultural land (Gklavopoulos, et al, 2024; Kalogiannidis, et al, 2023).

Given the multitude of threats facing Greek rural spaces, a critical question arises: "Is the Greek rural space merely a sum of plots that can be built upon indiscriminately?" This question underscores the growing tension between the economic pressures to develop rural areas and the need to preserve agricultural landscapes that are vital for food security, ecological balance, and cultural heritage. The unchecked conversion of agricultural land into urban and industrial spaces is not just a land-use issue, but a societal challenge that requires urgent attention to protect the environmental, cultural, and economic values embedded in rural spaces.

Focusing solely on productivity as a selection criterion for agricultural land protection overlooks significant areas that provide essential ecosystem services and possess diverse cultural, ecological, and socio-economic values. This narrow approach risks neglecting multifunctional landscapes that contribute to biodiversity, water regulation, and cultural heritage. A more comprehensive framework is needed, incorporating additional criteria that reflect the multifunctionality of agricultural landscapes. Existing quasi-operational criteria, such as those related to biodiversity and water resources (Dimopoulos et al., 2020), offer a foundation for expanding the assessment framework. Prioritizing land based on multiple values rather than productivity alone is crucial for sustainable landscape management and informed policy decisions.

4. Agricultural Land: A Rural Landscape Matter

The protection of agricultural land is inherently linked to the broader challenge of safeguarding, managing, and planning the rural landscape. A comprehensive approach to agricultural land protection must go beyond productivist criteria and incorporate ecosystem services, cultural heritage, and landscape values. However, two common concerns arise when expanding these criteria:

a) the absence of formal delineation and
b) the lack of an established assessment or classification process.

While robust methodologies already exist for evaluating biodiversity and water management, landscape remains a critical yet often overlooked factor. The rural landscape plays a fundamental role in shaping cultural identity, particularly in island regions where the smaller scale of landscapes makes agricultural areas with traditional crops and practices even more

significant. These landscapes not only support biodiversity and ecological functions but also preserve cultural heritage and maintain a sense of place for local communities (Meinig, 1979). In the following discussion, we will focus on the role of landscape in agricultural land protection

Landscape serves as a medium through which the relationship between humans and space is depicted, demarcated, manifested, and expressed (Pavlis and Terkenli, 2023). It functions as both a cultural reflection and a palimpsest, where historical, cultural, and environmental transformations accumulate over time, revealing the evolution of land use and its associated meanings. Beyond its physical form, landscape embodies a complex interplay of relations, images, ideas, and values—ranging from aesthetic and historical to ecological and national significance (Wylie, 2007).

In rural contexts, landscapes contribute to tourism by shaping visitors' experiences and reinforcing local identity. The protection of agricultural land is thus critical, not only for preserving rural landscapes but also for fostering sustainable tourism development through its link to local production (Carneioro, et al, 2015). However, rural landscapes are subject to continuous transformation due to shifts in agricultural and forestry practices, industrial and extractive activities, spatial and urban planning, infrastructure expansion, and tourism development. These forces accelerate landscape change, underscoring the need for effective management and policy interventions (Primdahl, 2014).

5. The Landscape Concept

Historically, the term landscape has been associated with physical land and territorial organization, with definitions referring to a collection of lands, an organized system of rural spaces, a piece of plowed land, or the extent of immovable property of a village (Pavlis, 2012). These older definitions primarily emphasized land ownership, use, and management within agrarian societies.

In more recent conceptualizations, the meaning of landscape has evolved significantly. The transition from the natural to the visual perspective positioned landscape as an image or scenic view, reflecting a way of perceiving and representing the world (Cosgrove, 1984). However, contemporary theories have moved beyond this visual representation toward an experiential understanding of landscape. This shift redefines landscape as dwelling, emphasizing its role as a lifeworld shaped by human interactions. This perspective introduces the concept of landscaping—a dynamic process shaped by embodied acts such as walking, cycling, driving, climbing, and gardening, reinforcing the idea that landscapes are continuously created and lived rather than merely observed (Wylie, 2007).

6. Landscape and Ecosystem: Interconnected Realities

Landscape embodies the intersection of nature and culture, forming an integral part of everyday life that is experienced through all senses. It encompasses both material and intangible dimensions, reflecting historical, ecological, and socio-cultural values. Strongly influenced by scale, landscape is recognized as a public good and a valuable resource, inherently linked to quality of life. Its significance extends beyond aesthetics, involving both rights and responsibilities for individuals and communities.

Similarly, an ecosystem consists of living and non-living elements that interact within a dynamic regulatory framework. While ecosystems possess mechanisms for maintaining stability, they remain vulnerable to human interventions that can either sustain or disrupt their balance. In particular, small-sized island ecosystems exhibit heightened sensitivity to external pressures such as environmental degradation, climate change, and unsustainable development. Recognizing the interdependence between landscape and ecosystem is essential for ensuring sustainable management and resilience in both natural and cultural contexts.

7. Landscape and Policy

During the 2023-2027 period, the Common Agricultural Policy (CAP) is organized around ten main objectives that address social, environmental, and economic goals. These objectives form the foundation of the Strategic Plans developed by EU countries for the CAP.
Among the key goals are:

- Support for maintaining agricultural activity across regions, especially for the smaller Aegean islands.
- Incentives for the cultivation of threatened species facing genetic erosion.
- Subsidies aimed at landscape protection, particularly for unique agricultural landscapes such as the vineyard of Santorini and the maintenance of terraced cultivation systems.
- Funding for the construction and restoration of agricultural terraces.
- Preservation of high natural value agricultural systems and landscapes.

Additionally, the concept of Globally Important Agricultural Heritage Systems (GIAHS), as defined by the United Nations Food and Agriculture Organization (FAO), recognizes landscapes of outstanding aesthetic and cultural value that serve as multifunctional ecosystems. These landscapes provide essential goods and services, supporting millions of smallholder farmers worldwide. GIAHS areas face threats from climate change, economic unsustainability, loss of biodiversity, and abandonment of traditional farming practices, yet they also serve as sources of agricultural innovation and cultural preservation.

In this context, the European Landscape Convention (ELC) emphasizes the need for landscape protection, management, and planning. The landscape is not only a natural and cultural asset but also a common good that belongs to everyone, ensuring quality of life through public participation and the acknowledgment of shared rights and responsibilities. The character of a landscape, as defined by the Council of Europe (Florence 2000) and Greek Law 3827/2010, results from the interaction between natural and human factors, emphasizing the need for integrated management approaches.

8. Landscape Policy & Methodology

An effective practice for protecting High-Value Agricultural Land (HVAL), which provides essential ecosystem services, can be achieved through the implementation of the ELC. "Landscape policy" refers to the principles, strategies, and guidelines developed by competent public authorities to guide the protection, management, and planning of landscapes (CoE, 2000)

A critical step in the ELC's implementation was the inclusion of the Landscape Parameter in 12 Regional Frameworks for Spatial Planning and Sustainable Development through the addition of Special Sections for Landscape (2014-2015). These sections

categorized landscapes into different zones, based on qualities such as aesthetic and natural beauty, recognizability, and rarity, alongside already recognized protected elements. They also involved the documentation of landscape characteristics, landscape values, the identification of threats, and proposals for protection and management measures (Kyvelou & Gourgiotis, 2019).

The ELC advocates for the creation of new institutional tools dedicated to landscape protection, management, and planning across Europe. Landscape Character Assessment (LCA) is a systematic process used to identify, describe, and map distinct landscape characteristics, offering a framework for landscape management and conservation while preserving unique character.

LCA involves observing and recording aesthetic and experiential qualities, identifying landscape types and areas, and engaging stakeholders through consultations. The process aims to recognize the intrinsic value of landscapes without making subjective judgments about their quality. Key components analyzed in LCA include landforms, land cover, settlement patterns, hydrology, cultural context, aesthetic factors, and socio-cultural influences. LCA also considers distinctiveness and scalability, making it an important tool in understanding public perceptions of landscapes, influencing decisions related to land use, conservation, and development (Senetra et al. 2015; Smyth 2011).

9. Example of Methodology Application

Gkoltsiou, Athanasiadou, and Paraskevopoulou (2021) present a methodological framework based on theories and applications involving Landscape Character Assessment (LCA), Globally Important Agricultural Heritage Systems (GIAHS), and UNESCO World Heritage Cultural Landscapes. This framework integrates knowledge from geography, landscape architecture, and landscape ecology.

The proposed criteria cover both natural and cultural landscape factors, including morphological and functional aspects, and values related to biodiversity, ecosystem services, and land and water management. It also encompasses aesthetic beauty, sustainable food practices, cultural values, traditional agricultural systems, cooperative structures, rules and regulations, and customs such as religious ceremonies and traditions.

To evaluate the applicability of these criteria, a comparative analysis was conducted using three Greek case studies: the mastic cultivation landscapes of Chios, the raisin vineyards of Aigialeia, and the olive groves of Thassos. This analysis aimed to identify strategic steps for applying the framework in real-world settings.

10. Conclusions

Agricultural land is a critical resource, providing a range of ecosystem services, yet its loss continues, with protection primarily granted to highly productive land. However, the current institutional protection mechanisms fall short in addressing the complexities of land use planning. A multidimensional conceptual tool, such as landscape, is needed to offer a more comprehensive approach to land protection.

The concept of landscape has evolved from a static "image" to a dynamic "experience," with actions like walking, cycling, driving, and gardening playing a role in shaping the landscape as a "lifeworld". There are methodologies available for applying landscape criteria

and developing policies, particularly within the framework of the European Landscape Convention (ELC), which could be adapted to the Greek context, especially on its islands.

Agricultural ecosystems not only offer vital ecosystem services but also constitute significant rural landscapes, which are particularly vulnerable on islands where the smaller scale of landscapes makes them more sensitive. While providing incentives for agricultural conservation is helpful, it does not address broader external pressures such as urbanization and tourism. Therefore, there is a need to combine regulatory measures with existing incentives, such as those provided by the Common Agricultural Policy (CAP), while focusing on stricter, more integrated strategies. Prioritizing additional criteria and regulations could help ensure more effective landscape management, and there is a pressing need for Greeks to reconnect with their landscapes and rediscover them as "places of life" before they are irreversibly lost (Terkenli, 2005).

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