CULTURAL PRACTICE

SEMI-NATURAL HABITAT

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SEMI-NATURAL HABITATS ARE HABITATS THAT HAVE BEEN ALTERED IN THEIR COMPOSITION, BALANCE OR FUNCTION BY HUMAN INTERVENTION.

They can vary from grazed habitats to numerous cultural elements, such as traditional farmsteads or plantations. Although not being natural, they still hold high values for both biodiversity and culture. Since they have been modified through human activity during long periods of time, these habitats depend on continuing use or management for their survival. However, the current rapid economic and social changes are threatening the survival of these habitats and the species that depends on them (Pita et al. 2009).

Many semi-natural habitats evolved through traditional agricultural and pastoral activities, and have left their mark on the landscape in the Mediterranean region. But the pervasive trend for land-use intensification is causing the loss of many of these habitats (Pita et al. 2009). With the Mediterranean region being one of the highest yielding agricultural areas globally, the current transformations could result in major population declines of farmland species across the region (Pita et al. 2009; Segre et al. 2019). Therefore, more research is needed to allow policy makers and farmers to make informed decisions on their landscape-use (Segre et al. 2019).

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THREATS TO THE PRACTICE

All across the world, semi-natural habitats are disappearing from the intensively used agricultural landscapes (Grashof-Bokdam & van Langevelde 2005). These habitats include field margins, ditch banks, hedgerows, dry stone walls, woods, ponds and many more. The agricultural practices in different countries have led to a high diversity of semi-natural habitats that host a specific biodiversity and are linked to the culture and history of the local population (Pita et al. 2009). With the increase in high-intensity used agriculture, the semi-natural elements have lost their economic values of providing fuel and partitioning fields (Grashof-Bokdam & van Langevelde 2005). More homogenous landscapes are favoured, that are also increasingly under the pressure from several stressors such as climate change. Although there have always been transformations happening at the landscape level, the current trend is shockingly rapid and shows a strong decline in habitat diversity.

RECOGNITION AND FUNDING

Since semi-natural elements no longer provide the values to the farmers in the intensively-used agricultural landscape, they often are seen as a loss of valuable space for the crops or livestock. Semi-natural elements are therefore removed to allow for higher yields from the area, without considering the possible beneficial effects the habitat bring. Incentives to guide and inform farmers on the value of semi-natural habitats as well as compensation schemes for their temporary loss of yield could aid in the survival of these elements (Segre et al. 2019).

Some of the semi-natural habitats are already being supported through funding from the European Union (Holland et al. 2017). Through the Common Agricultural Policy (CAP), the European Union allows the implementation of compensation schemes to protect or establish seminatural habitats, defined as "any habitat within or outside of the crop containing a community of non-crop plant species" (Holland et al. 2017). Since the Millenium Ecosystem Assessment, there has also been an increase in interest on researching the benefits that semi-natural habitats bring to the agricultural ecosystem (Holland et al. 2017).

Dry stone walls as semi-natural elements in agricultural terraces © Shouf Biosphere Reserve

Mosaic Landscape with hedgerows as semi-natural elements © GOB Menorca

1. CULTURAL SUSTAINABLE LAND-USE PRACTICES

It is not possible to clearly define or scrutinise what a semi-natural habitat precisely is, but it refers to a habitat that has been modified by human activity over a long period of time. Consequently, the number of examples of this habitat type are numerous, such as field margins, road verges, ditch banks, hedgerows and wooded banks (Grashof-Bokdam & van Langevelde 2005). But the remnants of buildings, parks, graveyards, woodlots and ponds are also considered semi-natural habitats.

Besides the fact that they provide heterogeneity at multiple spatial and temporal scales in the agricultural landscape, semi-natural habitats serve many purposes for the local community. A high proportion of semi-natural habitats boosts the populations of natural enemies (Alejandro Alvarez et al. 2019). They also provide a habitat for wild pollinator species, by increasing the availability of flowers and nesting positions (Alomar et al. 2018). Many farmland species depend on the semi-natural habitat for reproduction, while other use it for foraging or dispersal (Grashof-Bokdam & van Langevelde 2005). Many invertebrates use it as wintering or refuge habitat, and it provides the living habitat for sessile species such as plants (Grashof-Bokdam & van Langevelde 2005).

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The diversity of types of semi-natural habitats makes it hard to get a general overview. There are some types that are more heavily investigated than others, mainly hedgerows, woodlands and grasslands (Holland et al. 2017). Also, many studies focus on the management intensity of the semi-natural habitats instead of the amount or spatial configuration (Grashof-Bodam & van Langevelde 2005). Overall the effect on biocontrol, pollination, soil conservation or cultural values have been investigated less than biodiversity (Holland et al. 2017).

Several types of semi-natural habitats can be found in the research sites across the Mediterranean region. Most of the sites have heterogeneous landscapes with semi-natural habitats specific to the region. The *mandras* building system in Lemnos (Greece) or the *agdals* in the High Atlas (Morocco) are examples of semi-natural habitats that exhibit high value for local community and biodiversity. The heterogenous landscapes of the Dehesas y Montados (Iberian Peninsula) or on the island of Menorca (Spain) provide a diverse agricultural ecosystem for farming species, while preserving the traditions and culture of the local community.

2. BENEFITS OF THE PRACTICE

2.1. BIODIVERSITY

A review on the relationship between semi-natural habitats and agricultural biodiversity (Grashof-Bokdam & van Langevelde 2005) found seven out of nine studies with a significantly higher species diversity in agricultural landscapes with greater proportions of semi-natural habitat. These studies focused on different taxonomic groups from plants to spiders and butterflies. Other studies (Pita et al. 2009; Segre et al. 2019; van Halder et al. 2010) have found similar positive effects of semi-natural habitats on biodiversity. Semi-natural habitat was shown to be accountable for the highest level of arthropod, birds and plant richness compared to cultivated land and higher than field margins (Segre et al. 2019).

The most important factors determining butterfly diversity were the presence of semi-natural habitats, as these allow for the maintenance of a diverse herbaceous layer (van Halder et al. 2010). A higher abundance of carnivore mammals was found in mosaic landscapes with small agricultural fields and high cover of semi-natural habitats (Pita et al. 2009). However, especially ground-nesting bird species might be negatively affected by the higher predation pressure from these carnivores, favouring the occurrence of open farmland landscapes (Pita et al. 2009). A diverse heterogeneous agricultural landscape seems to be the most beneficial for the highest species diversity (Grashof-Bokdam & van Langevelde 2005; van Halder et al. 2010).

2.2. CULTURAL

Semi-natural habitats also reflect important cultural and historical values, but these are often hidden in the structures and the composition of the landscape. The value does not solely refer to the built environment and the visible constructions, but also the various types of vegetation and land patterns that were formed through centuries of human impact. Many of these semi-natural habitats are linked to traditions and practices of the local communities, and have historical links to their ancestors. Other examples of semi-natural habitats, such as natural parks or graveyards are actively being utilised by humans, culturally significant and important in aiding the human well-being.

2.3. CLIMATE CHANGE

Besides their cultural and natural values, semi-natural habitats are important advocates in the combat against climate change. In comparison to high-intensive agricultural patches, semi-natural habitats aid in the removal of air pollution, not only slowing down climate change but also reducing health costs for governments. These habitats can sequester carbon within both vegetation and soil, and help prevent soil erosion (Holland et al. 2017). They are an integral part of the human-affected landscape and have the potential to support many ecosystem services, from nutrient cycling to carbon storage, but more research is necessary to highlight their value for sustainable agriculture (Holland et al. 2017).

Mosaic landscape with semi-natural elements in the High Atlas
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2.4. SOCIO-ECONOMICAL

Semi-natural habitats are valuable for the ecosystem services they provide, that support not only the biodiversity but also contribute to the economy and the social structure of our society. Although the aesthetic and recreational value are hard to quantify, nobody can deny the effects on human well-being. An overwhelming consensus in literature agrees on the positive effects on food production and global biodiversity from heterogeneous landscapes, instead of the uniform high-intensive agriculture (Morrison et al. 2017).

Most research on ecosystem services provided by semi-natural habitats are on pest control and pollination, with a slight increase of interest in soil-related aspects (Holland et al. 2017). Semi-natural habitats provide food resources, shelter, breeding sites and overwintering zones for agents delivering biological control and pollination (Holland et al. 2017). Their prosperity affects food production and therefore are important for the global economy (Morrison et al. 2017). The investment on the preservation of semi-natural patches should be key, as they are generally more cost-effective, support wildlife-friendly farming with low sociological and economical conflicts (Segre et al. 2019).

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