

Farmers and Nature Together:

High Nature Value Farming and Agri-Environment Payments for the Republic of Macedonia



May, 2012

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Project implementing partners:

Avalon (the Netherlands),
Institute for European Environmental Policy IEEP (UK),
Ecologist's Movement of Macedonia DEM (Republic of Macedonia),
Center for Civic Initiative CCI (Republic of Macedonia)

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Abbreviations

AE	Agri-Environment
CAP	Common Agricultural Policy
CLC	CORINE Land Cover
CORINE	Coordination of Information on the Environment
EAFRD	European Agriculture Fund for Rural Development
EEA	European Environmental Agency
EU	European Union
HNV	High Nature Value
HNVF	High Nature Value Farmland
IACS	Integrated Administration and Control System
IBA	Important Bird Area
IEEP	Institute for European Environmental Policy
IPA	Important Plant Area
IPARD	Instrument for Pre-Accession Assistance for Rural Development
GDP	Gross Domestic Product
JRC	Joint Research Center
LPIS	Land Parcel Identification System
LU	Livestock Unit
MAFWE	Ministry of Agriculture, Forestry and Water Enterprise
MES	Macedonian Ecological Society
MoEPP	Ministry of Environment and Physical Planning
NAEP	National Agri-Environment Programme
NGO	Non-governmental Organization
NPK	Nitrogen, Phosphorus, Potassium
PBA	Primary Butterfly Areas
RDP	Rural Development Programme
UAA	Utilized Agricultural Area

Project partners



Avalon, The Netherland

Avalon is a not-for-profit organization based in the Netherlands. It was established in 1991 to stimulate sustainable rural development in Central and Eastern Europe (CEE). During its early years (1991-1995), Avalon focused specifically upon introducing the concept of organic agriculture, the relationships between agriculture and biodiversity, and the need for national action plans on these issues. From 1996, Avalon began to diversify its activities and provide support for the increasingly important concept of agri-environment support payments as a policy instrument for promoting sustainable rural development and from 1997 - 2001, a consortium led by Avalon (together with several CEE and EU-partners) implemented a programme of PIN-MATRA funded-projects entitled "Agri-Environmental Programmes in Central and Eastern Europe". These projects were undertaken in the 10 then EU pre- accession countries of CEE in response to the clear and urgent need to introduce, promote and develop the concept of agri-environment payments in those countries rapidly approaching EU accession at the time.

These projects made a significant contribution to introducing the principles and practice of agri-environment policy-making in the CEE region and left a clear legacy, including a number of very active national Agri-environment Working Groups that continued to elaborate pilot agri-environment projects for pre-accession SAPARD funding and full national agri-environment programmes for EU co-financing after accession. This approach was further successfully replicated during 2002 - 2004 in Croatia, Turkey from 2006 – 2008 and Serbia from 2008 – 2011.



Institute for European Environmental Policy (IEEP), UK

Institute for European Environmental Policy IEEP is an independent policy studies institute established in 1982 with particular expertise in agriculture, the environment and rural development policy in EU Member States and Accession Countries. In addition to working regularly for the European Commission, the European Parliament and the European Environment Agency, IEEP undertakes studies for a wide range of national and international organisations. IEEP has over 20 years experience in studying the environmental aspects of EU agricultural policy and first developed the concept of HNV farming systems in the early 1990s in conjunction with the Dutch government.

IEEP staff members follow environmental policy developments closely and stay in regular touch with relevant officials in the European Commission and national governments.



Ecologist's Movement of Macedonia (DEM), R. Macedonia

The Ecologist's Movement of Macedonia (DEM) is a non-governmental, non-profitable and apolitical association. It is an active national association that is founded upon an extensive network of 23 local environmental NGOs as full-members. It was established in 1990 in order to co-ordinate the work of the existing local groups and to raise public awareness about sustainable development, the protection of soil and water, and protection of biodiversity. DEM is a member of the Friends of the Earth - International (FoEI) and the International Union for Conservation of Nature (IUCN).

DEM has contributed extensively to the development of national environmental policy, including participation in the National Committee for Sustainable Development Strategy; preparation of the National Biodiversity Strategy for the Republic of Macedonia; preparation of the National Environmental Action Plans I and II, as well as co-ordination of the public campaign for NEAP I, and; representation in the National Committee for GMOs.



Center for Civic Initiative (CCI), R. Macedonia

The Center for Civic Initiative (CCI) is a non-party, non-profit organization that was established in 1997 in the city of Prilep, Macedonia. The primary goals of CCI are to facilitate the development of democracy and civil society in Macedonia, and to involve citizens in education and action to promote positive changes in their community and country through capacity building.

CCI works extensively on capacity building programmes for civil society organizations and networks in order to improve and contribute to their visibility, organizational/institutional management, donor accessibility etc. The organization has 8 full-time staff with the capacity to deliver trainings to a variety of different target groups, including public administration officials, majors, civil society organizations etc. It has a specific interest in supporting NGOs and civil society organizations to participate in the processes associated with EU accession, including the introduction of new rural development policies (which will impact upon a significant proportion of the Macedonian population).

CCI principle is to work with strategic partners and to network with organisations and institutions in favour of the citizen and the development. The impact driven projects are strong principle of CCI work and by this the accountability to the target groups and the beneficiaries.



Introduction

The project

The High Nature Value (HNV) farming concept has emerged and developed over the last 10-15 years in response to the growing recognition that many of the habitats and species upon which we place high nature conservation value in Europe have been created by farmers and their traditional farming practices. Farmers in many EU Member States therefore are increasingly valued as key players in biodiversity conservation, especially in more marginal areas with poorer land where less intensive – and therefore more biodiversity-friendly - farming methods are still practiced.

The HNV concept complements approaches to nature conservation that focus solely upon the maintenance of rare or endangered species and habitats on protected sites, by highlighting the need for large areas of land in the wider countryside, comprising a high proportion of semi-natural habitats, to continue to be occupied by farmers and managed with traditional farming methods to maintain their biodiversity value.

Whilst HNV farming is proving to be a popular and attractive concept for communicating the biodiversity benefits provided by traditional, low intensity farming systems, there remain many challenges associated with putting the concept into practice – especially linking the HNV farming concept to the day-to-day reality of farming in a rapidly changing world. Unfortunately, although the support and maintenance of HNV farming is a key theme of EU rural development policy, the real and practical issues relating to the maintenance of HNV farming systems remain relatively marginal and detached topics on the public agenda with discussion and debate limited to a few specialist (albeit highly motivated) interest groups.

Even assuming full political and public will to support HNV farming there remains one major obstacle standing in the way of a positive and sustainable future for HNV farmland. The unfortunate fact is that those farmers who deliver the greatest biodiversity benefit are typically farming under the most marginal circumstances and are therefore subject to the greatest social and economic pressures to abandon their traditional way of life. Many HNV farming systems across the EU are therefore enduring severe and rapid socio-economic change with increasingly large numbers of farmers abandoning farming. When the farmland is abandoned and the

traditional management practices stop, then the delicate balance of the HNV farming ecosystem is gradually lost and the diversity and abundance of wildlife declines. In other regions HNV farming systems are being lost to more intensive agriculture (e.g. the ploughing of grasslands for arable crops) or to different land uses altogether, such as the construction of tourism and recreation facilities.

Some of the highest concentrations of HNV farming in Europe are still to be found in central and south-eastern Europe, including countries in the Western Balkans. This is largely due to the traditional practices still in used in the region. The Republic of Macedonia is no exception, with large areas managed under HNV farming systems , using traditional, low intensity farming methods.

The Republic of Macedonia is a candidate country and is currently aligning its legislation with that in the EU. Although agri-environment schemes are one of the most efficient tools for supporting HNV farming, action to support these systems is not yet envisaged in the current draft of the National agri-environmental Programme (NAEP) in the country. Many of the contemporary concepts associated with the relationship between agriculture and the environment which are familiar to policy makers in EU Member States do not currently exist in the Republic of Macedonia and are therefore still a long way from being a) accepted by decision-makers and b) fully and effectively integrated into the policy making process.

The aim of this project was to demonstrate why it is important for agricultural policy in the Republic of Macedonia to take account of HNV farming systems and to develop the necessary skills amongst civil society organizations to enable them to develop their understanding of the importance of HNV farming in Macedonia and to promote the need for the continuation of these environmentally important

farming systems, and therefore support through policy in the future.

The project focused on the following activities:

- Training for local partners and local experts on all aspects of the HNV concept, including EU rural development policy;
- Undertaking a study on HNV farming in the Republic of Macedonia and the development of a simple typology of farming systems, a draft map of HNV farming and three local case studies of HNV farming systems, including the identification of their biodiversity and other “hidden values”;
- Preparing an “HNV Handbook for the Republic of Macedonia”, covering the key project outputs;
- Group” (high level) and “Joint Policy Network on HNV Farming” and organising regular meetings of governmental representatives (agricultural, environmental, regional development, social welfare), NGOs and other key stakeholders;
- Dissemination of project results with a series of round tables throughout the country;
- Local seminars for farmers in selected HNV farming areas to a) identify the challenges they face and b) to raise awareness of opportunities for improving their livelihoods;
- Identification and preliminary elaboration of rural development policy measures for supporting HNV farming systems, with particular emphasis upon opportunities for introducing suitable agri-environment payments;
- Development of a communication campaign by DEM local NGO members to promote the “hidden values” of traditional, low intensity farming systems in Republic of Macedonia.

About this handbook

This handbook presents many of the key outputs and recommendations from the project “Promoting High Nature Value Farming and Agri-environment Payments through Civil Society Organisations in the Republic of Macedonia” that was undertaken jointly by the Avalon foundation (the Netherlands), DEM (Republic of Macedonia), CCI (Republic of Macedonia) and IEEP (UK), with the financial support of the Dutch Ministry of Foreign Affairs through the MATRA Social Transformation Programme.

Although the main aim of the project is to build the capacity of civil society organizations in the Republic of Macedonia on the importance of HNV farming, it also has involved carrying out case studies on the occurrence of and issues facing HNV farming systems in three different regions in the country - Lacavica, Mariovo and Rekanski. The main findings of the case studies have been presented to the farmers and responsible institutions and are also presented in this handbook.

The handbook is intended to serve different stakeholders in the agricultural and rural development sector including policy and decision makers, regional authorities and services, non-governmental and scientific organizations addressing social, environmental and agricultural issues and the inter-linkages between them. The book is therefore produced in both the Macedonian and English language and can be used as a reference for future programming in the rural development sector in the country.

Chapter 1 of the publication examines the impact of current agricultural practices on the environment in the country. Chapter 2 then outlines the concept of HNV farming in the EU and its development over the time.

A first attempt to develop a typology of HNV farming systems in the Republic of Macedonia and the case study areas, along with indicative maps of their distribution are found in Chapter 3.

The needs of the HNV farmers and the main problems they face, as identified through the workshops, discussions and face to face meetings with them are presented in Chapter 4 and the link between HNV farming and social capital is further elaborated in Chapter 6. The hidden values of HNV farming systems are also presented in Chapter 6.

In order make the project results as useful as possible, proposals for agri-environmental type measures that could support HNV farming in the Republic of Macedonia were developed. The measures proposed are intended to complement the existing proposal for the NAEP of the Republic of Macedonia and to respond to the needs of the farmers in rural areas as a whole, and the case studies areas in particular. These proposals are presented in Chapter 5.

1. Chapter

The Agricultural and Environmental Situation in the Republic of Macedonia

Vyara Stefanova and Dimce Damjanovski

The Republic of Macedonia is situated in the South Western part of the Balkan Peninsula. It is a landlocked country with an area of 25 713 km² and its population is estimated at 2 million. The territory is predominantly mountainous (79%) intersected by large valleys (19%) and lakes (2%).

The mountains in the eastern part of the country are part of the old Rodope mountains group and are generally below 2000 m altitude. In the west, the mountains are part of the young Dinaric group with a much higher average altitude (over 2500 m). The highest peak in the Republic of Macedonia - Golem Korab (2,764 m) - is situated in this mountain range. The mountains are intersected by river valleys, extending mainly from the banks of Vardar river and its tributaries, and plains, the largest of which is the Pelagonija plain.

Karstic relief is represented mostly by limestone in the central and western part of the country.

1.1. Basic Environmental Profile

Climate

Macedonia is situated at the crossroads of Continental and Mediterranean climates which causes a wide variety of weather conditions. It is dominated by a Sub-Mediterranean climate, with warm and dry summers and cold and humid winters. Eight climate-vegetation-soil regions have been identified with significantly heterogeneous climatic, vegetation and soil conditions¹. The land used for agriculture production is located in the Sub-Mediterranean, Continental-Sub-Mediterranean and warm Continental areas at altitudes of 50-900 m. The summer and autumn seasons are dry and hot, while winters are snowy with short but intense freezing spells. The average annual precipitation is 733 mm distributed unevenly throughout the year and varying between regions. There is higher precipitation in the period from October to December and less from March to May.

The spring and autumn rains tend to be very heavy and often cause landslides, soil erosion and local floods. During the growing season on the other hand, drought is rather common which makes water a limiting factor for intensive agriculture production. Late spring freezing and early autumn frosts are also frequent.

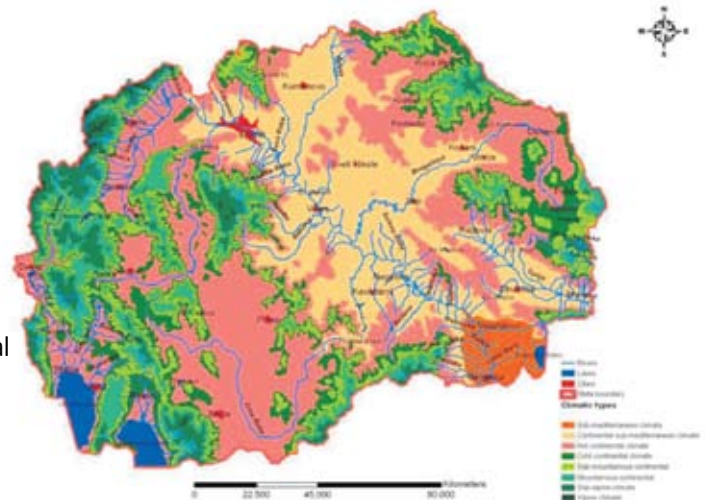


Fig.1.1 Climate map of the Republic of Macedonia

Water resources

Macedonia is considered rich in water resources with 4,414 springs recorded and mapped, and a total capacity of 6.63 billion m³ per year. It is divided in three watersheds: the Adriatic Sea (about 15% of the territory) with the main outflow from the Crn Drim River, the Aegean Sea (about 85% of the territory) with the Vardar River and Strumica River

as its main water flows, and the Black Sea which is not significant in terms of coverage.

The Vardar River is the longest river (388 km), 300 km of which runs through the centre of Macedonia. The Vardar's major western tributaries are the Crna River (207 km) and the Treska River (138 km), while the longest eastern tributaries are the Bregalnica River (225 km) and the Pchinja River (135 km).

Being a land-locked country, natural lakes are an important source of water for the Republic of Macedonia and they are also important from a cultural and landscape perspective. The most attractive lakes are the tectonic lakes of Ohrid, Prespa, and Dojran. Prespa and Ohrid Lakes, situated in the west of the country, border Albania and Greece. Lake Ohrid, the largest lake, covers an area of 358.8 km² (of which 229.9 km² are situated in the Republic of Macedonia). The lake is connected hydrologically with the upper Prespa Lake (274 km²). The smallest, Lake Dojran is situated in the south-east (42.7 km²) and crosses into Greece.

Soil

The Republic of Macedonia comprises over thirty different soil types with can change significantly over quite small distances. Almost all relief forms, geological formations, climatic influences, plant associations and soils that appear in Europe (with the exception of podzols) are represented² in Macedonia. The main soil types present are brown forest soils (around 28% of the territory), lithosols (around 15% of the territory) and regosols (around 12% of the territory).

Soils that are considered suitable for agricultural production are divided into eight fertility classes. Classes I-IV represent the highest productive quality. Around 59% of the total area of the country is covered by soil classes V-VIII which are mainly pastures and meadows.

Biodiversity and Natural Values

Similar to other East European and Mediterranean countries, the Republic of Macedonia is rich in biodiversity, both in terms of species richness and species diversity. This includes 1,580 algae species, 340 lichens, 1,250 fungi, 3,700 plant species and 9,339 animal species (8,833 invertebrates and 506 vertebrates). There are 854 endemic species (135 algae, 117 plants, 579 invertebrates and 23 vertebrates)³. Some of the largest remaining European populations of threatened mammals (brown bear (*Ursus arctos*), wolf (*Canis lupus*), Balkan lynx (*Lynx lynx martinoi*), wildcat (*Felis silvestris*), otter (*Lutra lutra*), marbled polecat (*Vormela peregusna*), lesser mole rat (*Spalax leucodon*), souslik (*Spermophilus*

citellus), chamois (*Rupicapra rupicapra*) and bats(as well as birds of prey survive in the mountains and gorges in protected areas. This is a direct result of the fact that large areas of habitats remain undisturbed, with their original species composition remaining largely intact. In recent decades, the increasing exploitation of wildlife species for commercial purposes has had a negative impact on the basic components of biological diversity, especially diatoms, medicinal plants, invertebrates and vertebrates.

Nature protection is regulated by the Law on Nature Protection (OG 67/04, 14/06 and 84/07). It is harmonised with the relevant EU legislation⁴ and incorporates the obligations from those international agreements in the field of nature conservation that have been ratified by the Republic of Macedonia⁵. Six categories of protected areas exist, in keeping with the classification of the International Union of Conservation of Nature (IUCN).

The network of protected areas comprises 81 sites and covers a total area of 231,385 ha⁶ (9% of the national territory). The protected areas include:

- 3 national parks, covering an area of 115,713 ha (4.5% of national territory);
- 4 strict natural reserves (covering 11,481 ha - 0.45% of national territory);
- 3 protected landscapes with special natural characteristics (5,387ha - 0.21% of national territory);
- 14 nature parks (1,457 ha - 0.06% of national territory);
- 57 nature monuments,(70,424 ha - 2.4% of national territory);
- 1 multipurpose area (26,923 (1.05% of national territory).

The development of the Emerald network⁷ in the Republic of Macedonia started in 2002. Currently it includes 19 areas covering 198,145 ha. However, the total area of conservation interest is much larger, comprising 35 sites with a total area of 752,223 ha (approximately 29% of the national territory).

According to estimates, 33 of the bird species listed in Annex 1 of the EU Birds Directive⁸ are found in the Republic of Macedonia.

Important Bird Areas (IBA) were first designated in 1989 for 10 IBAs in the Republic of Macedonia, covering an area of 2,709 km² (10% of the country's territory). A proposal by Birdlife International (2008) suggests increasing this to 21 sites, covering 6,538 km² (25% of the country). The first national inventory of IBAs in Republic of Macedonia was produced in 2012, through a partnership between MES (BirdLife in Macedonia) and DOPPS (BirdLife in Slovenia). The number of the sites proposed is 24 with a total area of 6,907

km², covering 27% of Macedonia. The publication also highlights that the existing network of protected areas is insufficient to protect the breeding sites of many of the priority bird species.

There are 42 Important Plant Areas (IPAs) identified in the Republic of Macedonia, with a total area of 459,425 ha (17.9% of country's territory). Forests are found in 85% of IPAs and grasslands in 80%. Of these grassland, the most common are dry pastures, found in 20 IPAs, and alpine and sub-alpine pastures found in 12 IPAs.

There are 8 Primary Butterfly Areas (PBAs) which are proposed currently, three of which are already protected at national level.

diversity because the grass communities are more heterogeneous and richer in species.

The majority of the pastures are still owned by the state and managed by the Public Enterprise of Pastures Management. Historically, Macedonian agriculture was dominated by small-scale private farming and this generally had a positive impact upon the environment with:

- the creation of a diverse agricultural landscape of mixed farms and small fields in the lowland regions;
- the creation and maintenance of semi-natural grasslands through upland and mountain grazing systems; and
- the breeding and use of local animal breeds and crop varieties.

Major changes occurred after 1945 with the expansion and intensification of agricultural production. Firstly, the traditional agricultural landscape of the lowlands was lost to intensive agriculture and secondly, almost all of the major swamps and marshes were drained to acquire new agricultural land (and to combat malaria). Because of this, most marsh ecosystems became seriously endangered, fragmented or threatened with extinction.

In recent years however, it is no longer the conversion of natural habitats into agricultural land that represents a serious threat to biodiversity. On the contrary, the most striking trend now is the large number of pastures (in the foothills and mountain areas) and meadows (in the lowlands) that are being lost to land abandonment and the cessation of the traditional farming practices that maintained these valuable semi-natural grasslands. According to the Biodiversity Strategy and Action Plan, "The diversity and mosaic-like distribution of habitats characteristic of traditional agriculture are seriously threatened. As a result, it is expected that, in two or three decades, this portion of the landscape will disappear, having been modified into shrubs and low forests".

This is reflected in the statistical information, which shows that between 2006 and 2008 the agricultural area decreased by almost 13% to 1,064, 000 ha, with the largest decrease (almost 22%) in pastures - from 687,000 ha to 542,000 ha. The abandonment of arable land is mainly due to the rural-urban migration and usage of the land for urban purposes and other non-farming activities.



Fig.1.2. Key biodiversity areas in the Republic of Macedonia

1.2. Basic Agriculture and Farming Profile

Land use and land use change

Agriculture represents 11% of GDP (2009) in Macedonia. In 2010 agricultural land covered 1.12 million ha divided between cultivable land (45%) and pastures (55%). The majority of the cultivable land is arable land. Permanent crops cover 7% of the agricultural area (35,000 ha) and meadows 59,000 ha. Forest areas cover 960,431 ha.

Pastures in Macedonia are mainly natural and semi-natural and are mostly situated in the larger mountain areas - Shar Planina, Bistra, Korab, Jakupitsa, and the Suva Gora mountains – although there are also pastures in the lowland. Depending on their use they are divided into summer and winter pastures. The average carrying capacity for these mountain and lowland semi-natural pastures is 3 heads of sheep and goat per hectare. This allows for the grazing of two million sheep and goats without any need for changes to be made to the grass composition. However, according to official statistics, the current number of ruminants is less than one million. Therefore the grasslands are being significantly under-grazed and are degrading due to the expansion of shrubby vegetation (e.g. juniper (*Juniperus*) and wild blueberry (*Vaccinium corymbosum*)). The dominance of this shrub vegetation reduces species

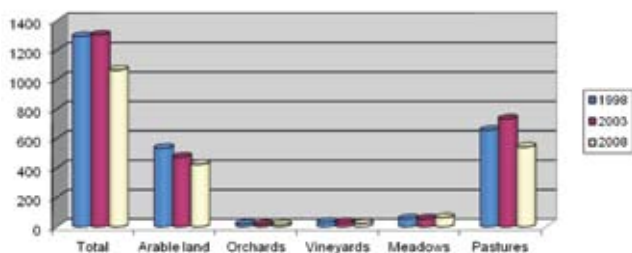


Fig. 1.3. Changes in agricultural land use in Macedonia 1998-2008

Agriculture

The structure of the agricultural sector is characterised predominantly by small-sized family farms. Around 80% of the agriculture holdings are estimated to be between 2.5 – 2.8 ha on average. They are owned or leased, and are highly fragmented into small parcels.

The main crops in the country (2009) are wheat (19.4% of arable area), barley (10.8%), maize (7.9%), and field vegetables (8.4%). The larger agricultural holdings specialise in the production of these crops. An estimated 20% (2008) of arable land is left fallow each year. Orchards are also a very important part of the agricultural sector in the Republic of Macedonia. The total area of orchards⁹ is 14,000 ha (8,789 ha of which are productive orchards), concentrated at altitudes of 300-800m. The most common fruits are apples (62%), plums (13%), sour cherries (7%) and peaches (7%). Vineyards cover more than 24, 777 ha (2009).

In terms of livestock in the Republic of Macedonia, the official statistics from 2010 reported 259,887 heads of cattle, 778,404 sheep and goats, 190,552 pigs, 1,994,852 poultry and 76052 beehives. Livestock farming is a traditional practice for farmers in rural areas given the high share of mountainous pastures and meadows. Extensive beef production is carried out by individual farmers producing for their own consumption and market oriented family farms. Sheep breeding in the mountainous areas along the northern, western and eastern borders is semi-nomadic and the breeds most commonly used are for both milk and meat production. The sheep farms are usually family-owned businesses. Recently, an increasing number of commercially oriented sheep farms have been established.

The traditional local breeds of farm animals have played an important role in the economic and social development of the country. They contribute to the preservation of traditional farming practices which provide environmental benefits. They help protect

important cultural landscapes characteristic of the areas that are associated with the rearing of specific indigenous breeds of farm animals in the typical regional manner and the production of healthy and quality food. The official data¹⁰ show that there are still significant numbers of local breeds of livestock being farmed in the country, although these numbers have declined over time. For example, in 2010 there were 26,952 Busha cattle (and its hybrids), 202,978 Ovchepolska sheep and 157,782 Sharplaninka sheep. The Karakachan sheep breed is under particular threat, however, and its status is considered to be critical, with only 627 left.

The share of arable land under organic production is still very small (0.27% in 2009). The introduction of state support, however, has resulted in an increase in the number of organic farms and farms in conversion. This is most evident in the wild plant gathering and organic cattle and sheep sectors (204,830 ha of pasture registered as organic in 2009), mainly because of the level of subsidies paid per head of livestock.

1.3. The Impact of Macedonian Agriculture on the Environment

Biodiversity and Landscape Conservation

In the Republic of Macedonia, the loss, modification and fragmentation of habitats have occurred from prehistoric times to the present; however, the nature of these processes have changed over the past few decades. Agricultural development has had a particular impact on habitats in the decades since World War II. Most of the marshes and swamps were drained and arable land expanded into natural habitats without taking into account their importance for biodiversity. The focus on increasing the area of agricultural land during the period of nationalisation has been another serious threat to biodiversity, and led to areas of natural vegetation at the edges of cultivated fields being destroyed. This, in turn, led to a loss of important wildlife corridors. More recently, the reduction of agricultural activities in rural (especially hilly) areas has contributed to the a complete change in the centuries-old appearance of the Macedonian landscape. Land abandonment is considered to be the most significant problem currently related to biodiversity and landscape conservation. In marginal and remote areas in particular, land abandonment has led to the deterioration and part disappearance of semi-natural grassland habitats



and traditional landscapes. Traditional management of grasslands as well as low input, high crop diversity mixed farming, which maintained high nature value habitats, have ceased in many marginal but environmentally valuable areas.

The genetic erosion of local breeds and varieties¹¹ has been given little attention or financial support. As is the case in other countries, during the past 50 years, new, more productive breeds have been imported. Both the original imported breeds and crosses with local ones are present today.

Use of Mineral Fertilisers and Pesticides

According to the limited data available, the use of mineral fertilisers in the country is low - approximately 104 kg NPK¹² per hectare of arable land or 12 kg NPK per hectare of agricultural land.¹³ However this is not a result of heightened environmental awareness among farmers, rather it is mainly due to the high prices of these products. From an environmental perspective, therefore, the core issue with the use of fertilisers does not relate to the quantities used, but to the frequency, timing, appropriateness and the quality of the mineral (chemical) fertilisers applied. Data on the use of fertilisers at the farm level do not exist.

It is also difficult to estimate whether and to what extent farmers in Macedonia overuse pesticides. Until recently, the application of pesticides has been entirely calendar-based, due to the absence of pest and disease monitoring systems. The number of pesticide applications in the course of one year varies between 6 to 11 (12), depending on the micro-climatic conditions in various parts of the country and perceived pest and disease incidence conditions during the year. However, based on information from informal analysis carried out in the past, the estimated level of pesticide residues in the end-products is far below the maximum level set by the EU standards. It would appear that, as in the case with fertilizers, farmers do not use excessive quantities of pesticides due to high cost and financial limitations.

Soil degradation

Soil erosion is the major form of soil degradation in the Republic of Macedonia and is one of the most important environmental issues. According to the map of erosion of the Republic of Macedonia (Institute for Water, 1993) 96.5% of the total area is subject to processes of erosion and 38% of the territory experiences medium to severe erosion processes. Water erosion dominates and the recent report from the European Environment Agency ranked Macedonia in the so-called "red zone of water erosion in Europe"¹⁴.

Soil erosion has increased in the last decade. The combination of natural vulnerability (sloping terrain, vulnerable soil structures and

intensive rain events), inappropriate land use (destruction of natural flora, conversion of grasslands for intensive crop cultivation, establishment of large fields involving the removal of former shelterbelts, landscape elements and field margins) and farming practices (overgrazing, use of monocultures, limited application of organic materials, ploughing of steep slopes, lack of soil conservation tillage techniques, insufficient use of winter cover crops) have contributed to the acceleration of erosion processes.

Water pollution

Water pollution from nitrates and phosphates as well as pesticides and organic manures associated with agricultural production is reported in the Republic of Macedonia. Although untreated municipal and industrial wastewater discharge is the main cause of water pollution, diffuse pollution of ground and surface waters with nitrates and phosphates (due to excessive application of mineral fertilisers and animal manures, especially in highly erosion-prone soils) occurs in areas where there are many intensive farms. The large livestock farms also can be point sources of water pollution as a result of inappropriate use of livestock manure (organic fertiliser), its storage and processing. Organic manure production is reported to amount to about 3 million t/year, of which 40% is from sheep, 40% from large ruminants and pigs and 20% from poultry¹⁵. The pollution from the large industrial pig and poultry farms has declined, but more attention is needed to improve facilities for manure storage on cattle and sheep farms.

Irrigation

The irrigated area in the Republic of Macedonia has been decreasing over the last 15 years. However, the construction of new irrigation systems and the low efficiency/high water use of old irrigation systems impose increasing water demands, especially in the driest months of the year when river flows need to be maintained downstream to protect fish, other freshwater species and their predators. Water-saving on-farm irrigation techniques (e.g. using drip irrigation) may alleviate the pressure on limited water resources and improve runoff of agro-chemicals, but these techniques are still not yet wide-used in agriculture in the Republic of Macedonia.



1.4. Conclusions

Macedonia is a biodiversity rich country both in terms of its species and habitats. Many of them are dependent on extensive farming practices, especially in the hilly and mountainous regions. The regional tendency in the Western Balkans of intensifying agriculture in the plains and lowlands and extensifying to the extent of abandonment in the mountainous areas is also experienced here. The challenge that the country is facing is to introduce and consciously implement good farming practices in the intensive agriculture areas to reduce environmental problems such as soil erosion and water pollution; and at the same time to encourage continued management of more marginal and remote mountainous regions particularly important for biodiversity conservation.

Footnotes

1. Second national communication on climate change, Ministry of environment and physical planning, 2008
2. T. Mitkova, J. Mitrikeski, Soils of the republic of Macedonia: Present situation and future prospects, European soil bureau, Research report No.9
3. Fourth National report on the implementation of the implementation of CBC in the Republic of Macedonia (2006-2008)
4. Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitat directive) and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (The Birds Directive)
5. Convention on biological diversity, CITES convention, etc.
6. Environmental statistics, State Statistical Office of the Republic of Macedonia, 2011
7. Emerald Network was set up under Bern Convention in 1996 to supplement the Natura 2000 Network, on a similar basis, in non-Community countries, based on the highest possible methodological synergy.
8. Directive 79/409/EEC on the conservation of wild birds ('The Birds Directive').
9. MAFWE, Facts and Numbers 2009
10. Department for Identification and Registration of Domestic Animals within the Veterinary Administration in the MAFWE, 2010
11. Country study for biodiversity of the Republic of Macedonia, 2007
12. Nitrogen, Phosphorus, Potassium
13. Agricultural land includes arable land and grasslands. Arable land includes land for arable crops, orchards, vineyards and improved pastures
14. Environmental statistics, State Statistical Office of the Republic of Macedonia, 2011, (chapter 5.1 Area affected by soil erosion)
15. Water Strategy for the Republic of Macedonia, draft version, 2010, MoEPP



2. Chapter

The background and principles of the HNV Farming concept

Kaley Hart

The concept of High Nature Value (HNV) farming has attracted significant interest from agricultural policy-makers and environmentalists in Europe because of its importance for biodiversity conservation. Because of this, the maintenance of HNV farming has been introduced as one of a suite of indicators for measuring the success of rural development programmes in all EU-27 Member States. The concept is described below along with an approach to its identification. Chapter 4 then illustrates how this concept can be applied in practice and sets out the different types of HNV farming systems that exist in Macedonia and where they are located.

2.1 What is HNV Farming?

The concept of “High Nature Value” (HNV) farming has emerged and been developed over the last 15-20 years in response to the growing recognition that certain types of farming are extremely valuable for wildlife and for maintaining biodiversity.

HNV farming systems were first described by Baldock *et al.* (1993) as “predominantly low-intensity systems which often involve a relatively complex interrelationship with the natural environment. They maintain important habitats both on the cultivated or grazed area (for example, cereals steppes and semi-natural grasslands) and in features such as hedgerows, ponds and trees, which historically were integrated with the farming systems....The semi-natural habitats currently maintained by HNV farming are particularly important for nature conservation in the EC because of the almost total disappearance of large scale natural habitats.”

This observation challenges the more usual contention that farming activities have a mainly negative impact on biodiversity. Instead it recognises instead that:

- many of the semi-natural habitats upon which we place high nature conservation value in Europe have been created by

farmers and their traditional farming practices; and

- in order to conserve these habitats and prevent further declines in biodiversity, it is necessary to maintain these farming systems.

In many parts of Europe, these types of farming systems also sustain rural communities and shape rural culture and traditions.

The HNV concept is different, albeit complementary, to the traditional approach taken to nature conservation. Instead of focusing solely upon the maintenance of rare or endangered species and habitats on protected sites, it embraces the need for significantly larger areas of land (including a high proportion of semi-natural habitats) to continue to be occupied by farmers and managed according to traditional farming methods (Beaufoy *et al.*, 1994).

One of the reasons that it is so important to use the concept of HNV farming to communicate the biodiversity benefits provided by certain types of farming, is the fact that the ongoing existence of these farming systems is not secure. One key challenge is the fact that HNV farming systems tend to be found in the more marginal areas of Europe where agricultural productivity is constrained by factors such as poor soils, steep slopes, high altitude and low rainfall. The other key challenge these farming systems face relates to their economic viability. Due to the constraints on their productivity,

their distance from markets and the fact that a significant proportion are semi-subsistence farms, HNV farmers tend to have much lower incomes than those farming in more fertile agricultural areas.

Those farmers who deliver the greatest biodiversity benefit are therefore typically farming under the most difficult circumstances (economic, social and environmental) and are subject to the greatest pressures to abandon their traditional way of life. Consequently across Europe, many traditional agricultural landscapes which are rich in biodiversity and culture are being lost to abandonment, intensification and changes in land use.

2.2 Approaches to identifying High Nature Value farming systems

Drawing on a definition developed by Andersen *et al.* (2003), HNV farming in Europe is defined as occurring where:

- agriculture is a major (usually the dominant) land use;
- agriculture supports or is associated with a high diversity of wildlife species and habitats, or the presence of species of European conservation concern, or both; and
- the conservation of these wildlife habitats and species is dependent upon the continuation of specific agricultural practices.

HNV farming systems are typically characterised by a combination of:

1. **Low intensity land use** - biodiversity is usually higher on farmland that is managed at a low intensity. The more intensive use of machinery, fertilisers and pesticides and/or the presence of high densities of grazing livestock greatly reduces the abundance and diversity of species on cropped and grazed land;
2. **Presence of semi-natural vegetation** - the biodiversity value of semi-natural vegetation, such as unimproved grasslands that are used for grazing, is significantly higher than intensively-managed agricultural land. Plus the presence of natural and semi-natural landscape features such as mature trees, shrubs, uncultivated patches, ponds and streams, rocky outcrops etc, greatly increases the number of ecological niches for wildlife to co-exist alongside farming activities;

3. **Diversity of land cover and land use** – the number and diversity of species and habitats that are able to thrive is significantly higher when there is a “mosaic” of land cover and land use, including low intensity cropland, fallow land, semi-natural vegetation and numerous landscape features. This creates a much wider variety of habitats and food sources for wildlife and therefore supports a much more complex ecology than the simplified landscapes associated with more specialised and intensive forms of agriculture.

It is not necessary for all three characteristics to be present within one farming system for it to be considered as HNV. Instead the three characteristics can be considered to interact as shown in Figure 2.1.

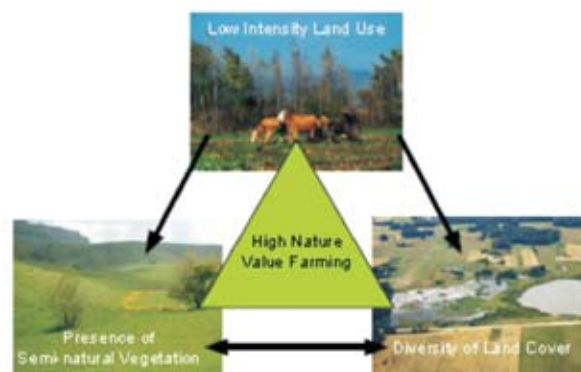


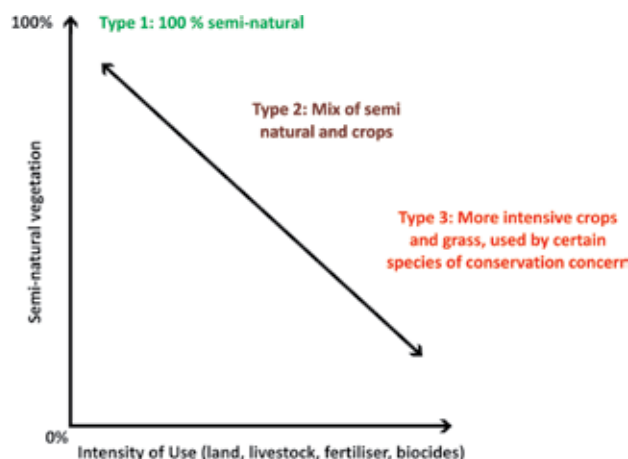
Fig. 2.1: The Three Key Characteristics of HNV farming

As shown in this diagram, the dominant characteristic of HNV farming is low intensity land use. Also essential is a significant presence of semi-natural vegetation. In some situations, however, this may also be found in combination with low intensity cropped areas, creating a mosaic landscape with a greater diversity of land cover. In line with this approach, three types of HNV farmland have been identified (Andersen *et al.*, 2003):

Type 1	Farmland with a high proportion of semi-natural vegetation, such as species rich grassland
Type 2	Farmland with a mosaic of low intensity agriculture and natural and structural elements, such as field margins, hedgerows, stone walls, patches of woodland or scrub, small rivers etc
Type 3	Farmland supporting rare species or a high proportion of European or World populations

The categorisation of HNV farmland into these three types is a useful aid to identifying HNV farmland on the ground. They are not intended to be precise categories with distinct boundaries. Rather they should be seen as a continuum ranging from those with a higher proportion of semi-natural vegetation and lower intensity use (Type 1) to more intensively managed farmland that still supports species of conservation value (Type 3) as shown in Figure 2.2 (IEEP, 2007).

Fig. 2.2: The continuum of HNV farming types 1, 2 and 3



Source: Beaufoy and Cooper (2008)

HNV Farmland Type 1: High proportion of semi-natural vegetation

The most common and widespread type of HNV farmland consists of semi-natural vegetation grazed under low intensity by livestock, often with traditional local breeds. The grazed semi-natural vegetation may be grassland, scrub or woodland, or a combination of these. In many instances, the semi-natural grazing may not form part of the farm holding, but has some other form of ownership, for example common land, state-owned land etc.

HNV livestock farms will usually have more than one type of forage land. This can range from semi-natural vegetation that is never cultivated, sown or fertilised, through grasslands that may be occasionally cultivated and/or lightly fertilised, to more productive or “improved” pastures, and cereal crops for fodder. Although more productive, these fields are generally still managed at a low intensity compared to conventional farming.

Determining which pastures are semi-natural, and which are not, is to some extent a value judgement. One approach is based on the presence of certain indicator species. Another approach is to decide that a pasture that has not been resown or fertilised for 20 years (for example) can be considered semi-natural. Very occasional cultivation may be compatible with semi-natural status. This is especially relevant in Mediterranean regions, where grasslands may be cultivated occasionally for scrub

control, without significantly reducing their semi-natural value. Spontaneous vegetation in olive groves and on low-intensity fallow land may also be counted in the same category if it is not affected significantly by fertilisers or biocides.

The fact that the vegetation is grazed by livestock (or mown for hay) is important, as this confirms that it is part of a farming system. Semi-natural grazing land is not necessarily always grassland. Scrub and forest are an important forage resource in some parts of the EU (especially southern and eastern regions). However, semi-natural woodland that is not grazed should be considered as a separate, non-farming land use. Semi-natural vegetation that is grazed primarily by wild herbivores, such as deer should not be counted as HNV farmland (Beaufoy and Cooper, 2008).

HNV Farmland Type 2: Mix of Semi-Natural Vegetation and Low Intensity Cropland

Farms and landscapes with a lower proportion of semi-natural vegetation, existing in a mosaic with arable and/or permanent crops, can also be of high nature value. Nature values will tend to be higher when the cropped areas are under low intensity use, providing a mix of habitats that are used by a range of wildlife species.

Because the proportion of land under semi-natural vegetation is less in Type 2 HNV farmland compared to Type 1, and the proportion of cultivated land is greater, the management of the cultivated land and the existence of an “ecological infrastructure” of landscape features is especially critical for wildlife. More intensive use of the cultivated land and the removal of features would lead to a rapid decline in biodiversity values.

Peripheral unfarmed semi-natural features, such as hedges, other field margins and trees are often found on Type 2 HNV farmland. These provide additional habitats for species and will tend to increase the biodiversity value of the farming system. However, their total surface area is usually small compared to the area of productive farmland. It is therefore the characteristics of the productive area which determine whether the farmland in question is HNV - the presence of unfarmed features alone is not sufficient (Beaufoy and Cooper, 2008).

HNV Farmland Type 3: Intensive Crops and Grassland Used by Certain Rare Species

At the more intensive end of the HNV spectrum are farmland types whose characteristics of land cover and farming intensity would not necessarily suggest HNV farming, but which nevertheless continue to support species of conservation concern - either rare species or a high proportion of European or World populations (Beaufoy and Cooper, 2008).

2.3 Why is HNV Farming a Priority for the European Union?

The European Environment Agency has estimated that around 30% of the EU's total agricultural area can be considered to be HNV, covering about 74 million hectares (Paracchini *et al.*, 2008). As shown in Figure 2.3, however, HNV farmland is not evenly distributed in the EU and much larger concentrations are found in southern and eastern Europe.

Unfortunately the extent and condition of HNV farmland in Europe declined greatly during the 20th century (with serious consequences for biodiversity such as farmland birds) due to the combined pressures of

- i) abandonment of all farming activities;
- ii) intensification and conversion of HNV grassland to arable land; and
- iii) loss of HNV farmland through change of land use.

Since the early 1990s, millions of hectares of farmland in central and eastern Europe have been abandoned as the agricultural industry has re-structured following the collapse of Communism. This abandoned farmland includes huge areas of species-rich semi-natural grasslands and low intensity arable land with a subsequent loss of floral diversity, feeding areas for wintering birds, breeding sites for birds of European importance and many other important habitats (Keenleyside and Baldock, 2007). Prior to this, the expansion and intensification of agriculture

throughout Europe since the 1940s contributed to a significant loss of biodiversity due to the conversion of grassland to arable land, the drainage of wetlands, removal of field boundaries and other unfarmed features to create larger field sizes and the increased use of fertilisers and pesticides.

In 2001, the European Council made a commitment to halt the decline in biodiversity in the EU by 2010 as a signatory to the Convention on Biological Diversity (CBD). Two years later, European Ministers of Environment recognised the specific importance of farmland biodiversity, and the urgent need to take care of it when they agreed that: "By 2006, the identification, using agreed common criteria, of all high nature value areas in agricultural ecosystems in the pan European region will be complete. By 2008, a substantial proportion of these areas will be under biodiversity sensitive management by using appropriate mechanisms such as rural development instruments, agri-environment programmes and organic agriculture, to inter alia support their economic and ecological viability" (UNEP, 2003).

The 2010 biodiversity has not been met. As a result, in March 2010, the European Council adopted a new biodiversity headline target for 2020, '*to halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, restore them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss*'. To achieve this, additional policy efforts to maintain HNV farming will be needed. Indeed, the EU's current Biodiversity Action Plan refers to "optimising the use of available measures under the reformed CAP...to prevent intensification or abandonment of High Nature Value farmland, woodland and forest" and to ensure that adequate financing is provided for HNV farmland and forests.

The preservation of HNV farmland first appeared as an EU policy priority in 1999 when the Rural Development Regulation (Council Regulation No. 1257/1999) stated that support for rural development should be directed towards "the preservation and promotion of a high nature value and a sustainable agriculture respecting environmental



requirements". The same Regulation also stated that support for agri-environment measures shall "promote the conservation of high nature value farmed environments which are under threat".

Under the current European Agricultural Fund for Rural Development (EAFRD) (Council Regulation No. 1698/2005) and the accompanying Community Strategic Guidelines for Rural Development (2007–2013) (Council Decision 2006/144/EC), the provisions made for maintaining HNV farming are much more robust and put a number of obligations upon EU Member States. This includes identifying the preservation of HNV farming as a strategic priority for Member States as follows:

'To protect and enhance the EU's natural resources and landscapes in rural areas, the resources devoted to axis 2 should contribute to three EU level priority areas: biodiversity and the preservation and development of high nature value farming and forestry systems and traditional agricultural landscapes; water; and climate change.' (emphasis added).

This translates into an obligation upon EU Member States to conserve HNV farmland and associated farming systems:

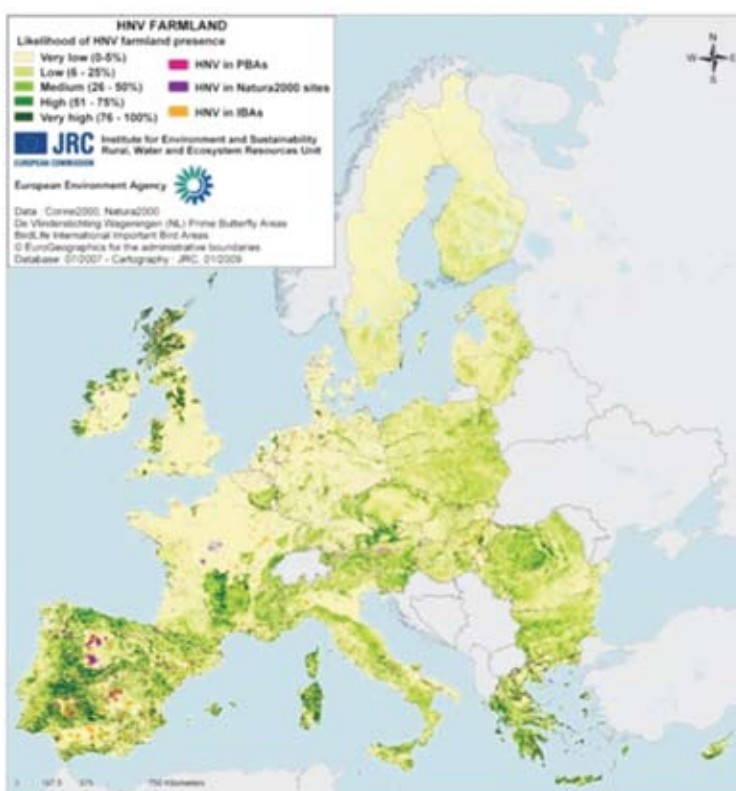
1. Firstly, each Member State should identify what "HNV farming" means in their own national context;

2. Secondly, they should support HNV farming systems and the preservation of HNV farmland by including appropriate measures in their national rural development programmes; and
3. Thirdly, they should monitor and report changes in the total (baseline) area and quality of HNV farmland in order to assess the impact of rural development programmes and measures.

The commitment to maintaining HNV farmland continues in the European Commission's proposals for rural development policy for 2014-2020. These state that the newly named agri-environment-climate measure should give specific attention to the additional needs of farming systems that are of high nature value (COM(2011) 627 final/2).

These are ambitious objectives, but with the political will to ensure that appropriate policy measures are in place and sufficient budgetary resources made available for their implementation, these valuable farming systems can be maintained for future generations.

Fig 2.3: Likelihood of the presence of HNV farmland in the EU-27 Member States



Source: High Nature Value Farmland in Europe — An estimate of the distribution patterns on the basis of land cover and biodiversity data (Paracchini *et al.*, JRC-IES and EEA, 2008). http://agrienv.jrc.ec.europa.eu/activities_HNV.htm



3. Chapter

High Nature Value Farming Systems in the Republic of Macedonia

Suzana Kratovalieva, Vyara Stefanova, Dusko Mukaetov, Svetozar Petkovski and Vesna Sidorovska

3.1. Extensive Farming Systems in the Republic of Macedonia

Similar to other East European and Mediterranean countries, Macedonia has very high levels of biodiversity associated with low intensity and traditional farming practices. Most of the typical cattle and sheep breeding systems are grazed on the country's natural and semi-natural grasslands associated with type 1 HNV farmland (extensive grasslands). In some of these systems pure local breeds still can be found. The main farming systems associated with the natural and semi-natural grasslands in the country are listed below.

Extensive livestock systems (pastoralism)

Extensive pastoralism is still practiced in the mountain regions of the Republic of Macedonia. Most of the herds are from different strains of *Pramenka* sheep and/or hybrids with *Württemberg*, *Merino* and east Frisian sheep. *The Sharplaninska* strain is found in Western Macedonia and the *Ovchepolska* strain still exists along the Vardar River and Eastern Macedonia.

The grazing periods depend on the altitude and climatic characteristics of the vegetation belts. Lowland meadows and hilly pastures are used in spring and early summer, then the animals climb vertically to high meadows where grazing continues. In the region of Reka and Makedonski Brod sheepfolds for animals are built in the mountains. High altitude allows the shepherds and their flocks to move from the central part of Macedonia towards Lakavica in the west, where grazing continues for a further period of 2-2.5 months (July, August, mid September).

Pastoral herds in the Shar mountain, Korab, Stogovo, Bistra, Mavrovo and Jakupica are usually guarded by the "Sharplaninec" shepherd dog. On average 4-5 dogs protect herds of about 150 sheep from wolf attacks.

Breeding of Balkan indigenous sheep *Pramenka*, strain *Karakachanska*

The main pure breed herd of *Karakachanska* sheep (60 heads) is located in the region of Kumanovo. This race is bred mainly for the subsistence needs by the Vlach population. Although no precise statistical data exist, estimates show that around 600 heads can be found in the Republic of Macedonia as a whole. The *Karakachanska* strain of *Pramenka* sheep are still bred in nomadic or semi-nomadic systems. One of the best known products is the hard yellow cheese known as *kashkaval*, which is still prepared using a traditional hundred-year old recipe of Shar mountain shepherds.

Domestic Balkan goat

The traditional breeding of domestic *Balkan* goat is widespread in Western Macedonia. It is associated with extensive grazing on meadows and hilly pastures near the villages. The rich natural and semi-natural grass vegetation is mown and used for feed in the winter. The total estimated number of domestic *Balkan* goats is around 38,000 heads. They are raised mainly on individual holdings with 50-100 heads, and herds are rarely larger than 150. Trebishte village is one of the few where *Balkan* goats are found in almost all households.

Alpina goat

In the high mountainous regions the *Alpina* goat (so-called *Alpine goat*) is bred, with around 10,500 heads remaining. It is estimated that one third

of the population are pure breed and the rest are hybrids with the highly productive Sanska breed. Extensive grazing is typical in the hilly-forest systems and in the forest belts in Western Macedonia. Grazing is nomadic or semi-nomadic (horizontal and vertical) and depends on the seasonal changes.

Balkan horse

A common practice in small, less developed villages in Western Macedonia and some central regions is breeding of the *Balkan horse* (Bosnian-Herzegovinian autochthonous breed). Horses are still used as indispensable means of transport and are found sporadically in farm families and small holdings. The main population used to be found in the village of Vitachevo, near Kavadarci, and in Mariovo but the number has reduced drastically in recent years. Nowadays it is more common to find between 1-5 Balkan horses being bred in herds with more than 100 sheep. Horses can be found also grazing extensively in rural areas surrounding villages.

Re-introduction of domestic buffalo

The total number of domestic buffalo was estimated to be around 55 heads in 2009. The animals are grazed and fed with hay from natural meadows in a few individual farms near Stip (Vrsakovo), Strumica (Radovo), Prilep (Debreshta) and Makedonski Brod.

Autochthonous Macedonian honey bee

The autochthonous *Macedonian honey bee*, commonly known as the “Marioska bee” (*Apis mellifera macedonica*) forage for nectar on meadows and pastures near the forest belts, thus assuring species pollination and self-renewal of the grass areas especially within the open meadows near Krushevo. Besides producing honey, pollen, wax and other bee products, this system supports the rich biodiversity in the region. Chestnut honey is widely known as a local product in the regions of Debar and Reka and households with more than 20 beehives are considered agricultural holdings producing honey.

Semi-extensive livestock breeding

Semi-extensive systems of livestock production (cattle, sheep, and goats) are based on grazing on natural grassland, meadows and pastures bordering forest belts or at the bottom of the high mountains. Very often livestock graze also on mountain plateaus. The systems are characterised by seasonal grazing practices: summer grazing in Western Macedonia (Reka region, Mavrovo), extended summer grazing in Eastern Macedonia (Plavica, Ratkovica, Stalkovica, Kratovo) and summer-winter grazing in Central Macedonia (Lakavica). These livestock systems are often associated with dairy farms and sheepfolds.

Milk is stored in so called “gjumovi”¹ and the main products are soft white cheese (sheep, cow, goat), hard yellow local cheese “korabski kashkaval” and the famous “Stip’s pastrmajlija”. A well known Macedonian cheese product produced from these types of semi-extensive systems is the so called “bieno” cheese. It originates from the XV century, when it was produced only from sheep’s milk in the region of Mariovo. Nowadays the recipe is changed and the cheese is produced as a mixture of cow and sheep milk, cow and goat milk or pure cow milk throughout the Republic of Macedonia and is known under various names, such as “Kumanovo’s yellow” cheese or “Mariovo’s baked on the sun” cheese.

Cow-calf (suckler cow) systems

One of the most efficient, relatively long-term and economically viable farming systems is the cow-calf (suckler cow) system for fattening of cattle. The animals are usually hybrids with at least 20% of the local *Busha* (Common grey) breed. This system is practiced in the Bitola part of Mariovo (Staravina), the Prilep part of Mariovo (Vitolishte), Bogdanci, Osogovo mountain, Delchevo, Kratovo, Kriva Palanka and Stip. Extensive grasslands are used almost throughout the year (summer-winter grazing) and the animals are additionally fed with hay and concentrate.

Temporary grasslands for hay production

These temporary grasslands are created to provide feed for livestock on larger individual farms. They consist of grass-leguminous and leguminous vegetation and are cut 5-7 times per year in the Ovce Pole region, Stip region and Rankovce and 3-4 or 5 times in the Debar region. These grasslands are managed in a traditional way with only manure spread on them.

Mosaic systems of arable/grassland

The combination of arable agricultural land separated by natural boundaries (hedges, stone walls, bushes ...) and natural and semi-natural pastures and meadows forms the typical mosaic landscape in Central Macedonia (Lakavica), high-mountain villages in eastern Macedonia (Osogovo mountains, Maleshevi mountains), above the villages Rostushe and Bitushe in Western Macedonia and at the base and on the slopes of the Shar mountain and in the South-eastern part of the country (Rankovce, German Mountain).

Fruit and vegetable production is also typical for the country. The main vegetables grown are tomatoes and peppers. Only a proportion of the produce is marketed, with the rest being used for own consumption. Small parcels of traditional varieties of apples, pears, plums and vineyards are grown in family gardens or near villages. Orchards are also often combined with beehives.

¹ Milk-cans

3.2. Simple classification of potential HNV farming systems in Republic of Macedonia

A simple classification of potential HNV farming systems in the Republic of Macedonia is presented in Table 3.1.

Table 3.1. Potential HNV farming systems in the Republic of Macedonia

No. on the map	Potential HNV farming system	Key characteristics – short description	Distribution in Macedonia (where it occurs)	Valuable landscapes/ habitats associated with potential HNV farming system	Associated autochthonic breed
1.	Combined system of extensive grazing of semi-natural grasslands and semi-extensive farming	Grazing around the villages and production of own fodder on small plots of arable land. The so called cow –calf livestock system (suckler beef) has long traditions in MK. Cows are usually hybrids with at least 20% of the local Busha breed, and thus are more adapted to local conditions. Extensive grasslands are used almost throughout the year (summer-winter grazing) and combined with feeding with hay and concentrate.	Widespread in mountain regions across Macedonia, especially in Staravina-the Bitola part of Mariovo, Vitolishte-Prilep part of Mariovo, Delchevo, Makedonski Brod, Bogdanci, Osogovo mountain and Stip region (v. Selishte)	Variety of grassland communities (<i>Chrysopogon gryllus</i> , <i>Andropogon ischaemum</i> , <i>Haynaldia villosa</i> , <i>Trifolium arvense</i>), Aromatic and medicinal plants (<i>Hypericum perforatum</i> , <i>Mentha longifolia</i> , <i>Achillea millefolium</i> , <i>A. compacta</i> , <i>Tanacetum vulgare</i>) Small scale mosaic landscape Variety of birds nesting in grasslands (<i>Ciconia nigra</i> , <i>C. ciconia</i> , <i>Coturnix coturnix</i> , <i>Merops apiaster</i> , <i>Streptopelia turtur</i> , <i>Parus montanus</i>) Berries such as <i>Rubus fruticosus</i> agg., <i>Rosa cannina</i> , <i>Ribes</i> spp. and wild plums (<i>Prunus cerasifera</i>)	<i>Busha</i> autochthonic breed “ <i>Mariovska</i> bee” <i>Pramenka</i> sheep <i>Balkan</i> horse
2.	Semi-natural meadows or sown meadows used for hay	Small scale mosaic landscape including semi-natural grassland and production of fodder crops. To meet the additional dietary needs of livestock on the larger individual farms, sown fields (grass-leguminous, leguminous in monoculture) are mown several times per year. Only livestock manure is used on the sown fields.	The semi-natural grasslands are cut 5-7 times per year in the region of Ovce Pole (Stip region, Rankovce, Staro Nagorichane) and 3-4 (5) in the region of Debar.	Variety of birds nesting in hay meadows, depending on late mowing (<i>Lanius collurio</i> , <i>L. minor</i> , <i>Galerida cristata</i> , <i>Alauda arvensis</i> , <i>Parus major</i>) Sown meadows of grass-leguminous mixture (<i>Dactylis glomerata</i> + <i>Lolium perenne</i> + <i>Trifolium pratense</i>)	<i>Ovchepolska</i> sheep

3.	Winter pastures	Semi-extensive system of livestock production (cattle, sheep, goats) based on grazing on natural grassland, meadows and pastures bordering forest belts based at the base of the high mountains or in the plain areas. The grasslands can be used through the whole year (also the winter period)	Valleys along the rivers, Stip region, Lacavica, Ovche Pole, Sveti Nikole, slopes of Konechka Mnt.	<p>Hunting game, Spur-thighed Tortoise (<i>Testudo graeca</i>)</p> <p>Grassland habitats such as <i>Koeleria macrantha</i>, <i>Stipa pennata</i>, <i>Arrhenaterum elatius</i>, <i>Festuca</i> spp., <i>Poa pratensis</i>, <i>Agropyron repens</i>, <i>Trifolium echinatum</i>,</p> <p>Birds: winter visitors such as <i>Anas crecca</i>, <i>Circus cyaneus</i></p>	
4.	Summer grazing of alpine (highland) pastures	Extensive (or semi-intensive) sheep grazing of high mountain pastures, with hay cutting for winter fodder. The great difference in altitude is reflected in the length of the grazing period and the effective utilization of grass cover. Lowland meadows and hilly pastures are used in spring and early summer, after which cattle and sheep climb vertically to high pastures where grazing continues. This semi-nomadic livestock system is dynamic, changeable and dependent on the climatic characteristics of the vegetation belts. After summer months some of the shepherds move their flocks to the central part of Macedonia, where grazing continues in July, August and part of September.	Commonly found in Reka region, Shar planina and the regions of Makedonski brod, Korab, Stogovo, Bistra, Mavrovo, Jakupica where usually summer 'sheepfolds' are built for the sheep and cattle	<p>Variety of grassland communities (<i>Nardus stricta</i>, <i>Poa violacea</i>, <i>Bromus riparius</i>, <i>Anthoxantum odoratum</i>), Aromatic and medicinal plants (<i>Origanum vulgare</i>, <i>Mentha pullegium</i>, <i>Hypericum olympicum</i>, <i>Salvia officinalis</i>, <i>Sideritis raeseri</i>, <i>S. scardica</i>, <i>Thymus</i> spp.)</p> <p>Wild berries such as <i>Rubus idaeus</i>, <i>Vaccinium myrtillus</i>, <i>Rubus tomentosus</i></p> <p>Birds : <i>Aquila chrysaetos</i>, <i>Falco peregrinus</i>, <i>Alectoris graeca</i>, <i>Crex crex</i></p> <p>Fauna closely related with grasslands and managed agricultural pastures (<i>Lacerta agilis</i>, <i>Vipera ursinii</i>, <i>Dinaromys bogdanovi</i>)</p>	<p><i>Alpine</i> goat including hybrids with the local breed <i>Sanska</i></p> <p><i>Pramenka</i> sheep</p> <p><i>Sharplaninka</i> sheep</p> <p><i>Karakanchanska</i> sheep</p> <p><i>Sharplaninets</i> (dog)</p>

5.	Old extensive or semi-intensive orchards	Old orchards with grass cover and beehives. Main income from the honey. Small plots, usually 0.1 -0.3 ha	Resen , Ohrid, Prespa, Krushevo	Old varieties of apple, pears, cherries Grassland habitats such as lowland meadows (<i>Lolium perenne</i> , <i>Poa bulbosa</i> , <i>T.resupinatum</i> , <i>T.balansae</i> , <i>T.medium</i>))	
6.	Mosaic systems	The combination of arable land separated by natural boundaries (hedges, stone walls, bushes ...) and natural pastures and grassland areas grazed by sheep, cattle and goats form a mosaic of habitats.	Found in Central Macedonia (Lakavica), as well as the hilly parts of the south-east (Kratovo, Kriva Palanka, Rankovce, Negotino, Kavadarci), high-mountain villages in eastern Macedonia (Osogovo mountains) and in some of the villages in western Macedonia (Rostushe, Bitushe).	Grassland habitats such as clover-grass pastures (<i>Trifolium pratense</i> , <i>T.resupinatum</i> , <i>T.alpestre</i> , <i>Festuca pratensis</i> , <i>F.arundinacea</i> , <i>Poa pratensis</i>) <i>Testudo hermanni</i>), <i>Emys orbicularis</i> , <i>Lutra lutra</i> Farm birds (<i>Alectoris graeca</i> , <i>Crex crex</i>) migratory birds (<i>Ciconia nigra</i> , <i>Aquila chrysaetos</i>)	

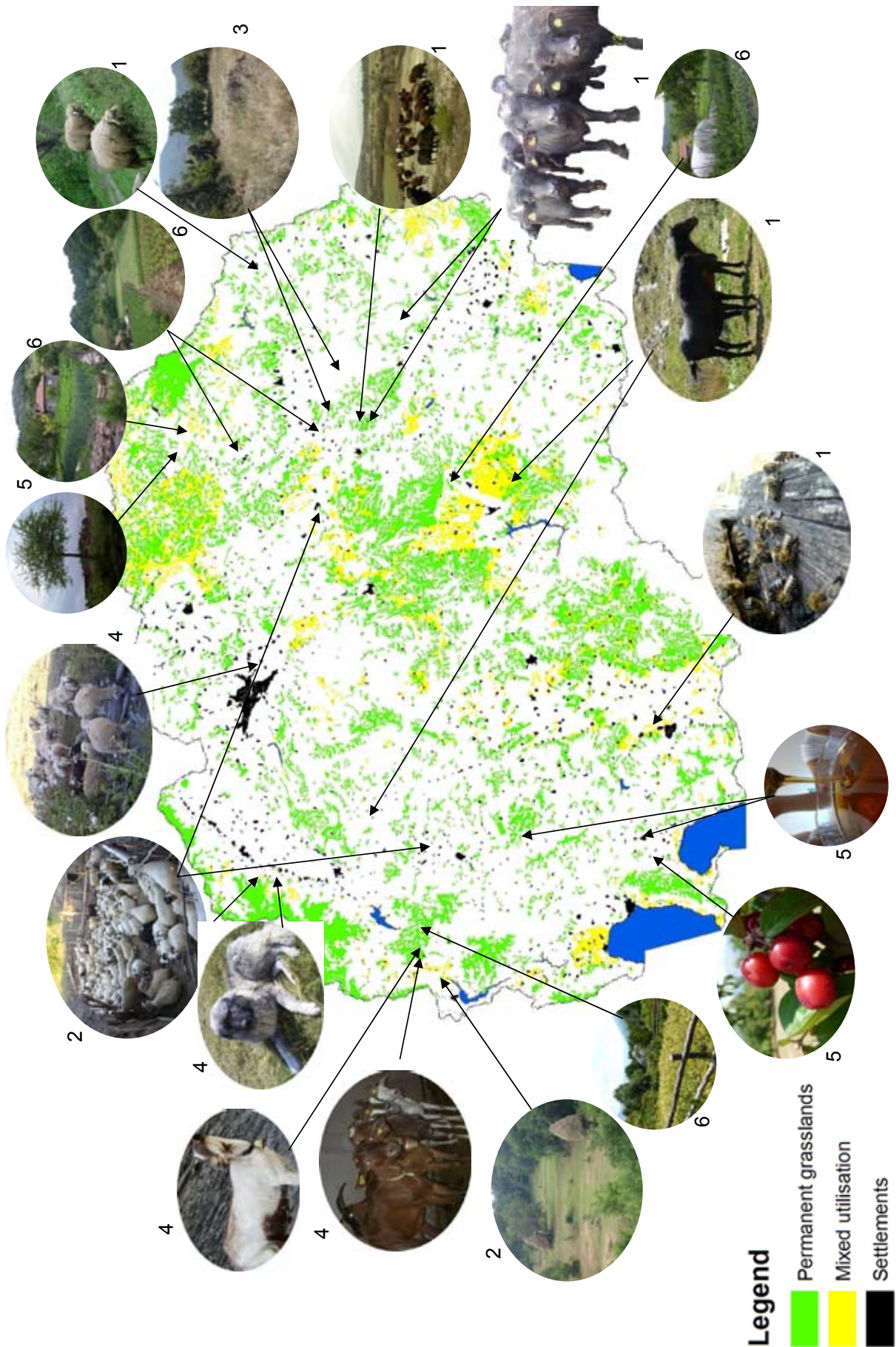


Fig.3.1. Annotated map of the potential HNV farming systems in the Republic of Macedonia

3.3. Mapping HNV farmland in the Republic of Macedonia

In order to illustrate spatially the distribution of HNV farming systems in the Republic of Macedonia a digitised map was produced, using the following databases:

- CORINE Land Cover classes – Database provided by the EEA (European Environment Agency);
- Important butterfly areas – low resolution raster map 1:1,000,000, provided by the Ministry of Environment and Physical Planning;
- Important bird areas – GIS coverage provided by the Ministry of Environment and Physical Planning;
- Emerald sites – GIS coverage indicating the ecological network for conservation of flora and fauna and their natural habitats in Europe;
- Aerial photos of the selected case study areas – provided by the State authority for geodetic works; and
- Digital elevation model provided by the Ministry of Environment and Physical Planning.

The process of mapping HNV farming systems consisted of several steps, as follows:

1. Collection of the input material and its transformation into an appropriate coordinate system and resolution;
2. Reclassification of the CORINE land cover and calculation of the output layer;
3. Vectorization of protected areas, PBA, and IBA areas into GIS;
4. Overlay of the GIS coverage of PBA, PA and IBA areas with the CLC data in order to develop the HNV map for the whole territory of Macedonia.
5. Elaboration of HNV maps.

The main source of data used for identification of HNV farming in Macedonia was the CORINE Land Cover 2000. The projections used for the development of the geo-database in GIS was Gauss–Krüger at a scale of 1:100,000. CLC is organised in 44 classes at its third output level. Out of these, 8 classes were selected according to experts' opinion and EEA methodology as potential HNV farmland (Table 4). A reselection of CLC classes was made accordingly and a new output layer was derived, consisting of 8 classes.

Table 3.2. CORINE Land Cover classes selected as a basis for the identification of HNV farmland in the Republic of Macedonia

CLC code	Description
221	Vineyards
222	Fruit trees and berry plantations
324	Transitional woodland-shrub
241	Annual crops associated with permanent crops
242	Complex cultivation patterns
243	Land principally occupied by agriculture, with significant areas of natural vegetation
321	Natural grasslands
231	Pastures

In the second stage of elaboration of the map the selected CLC classes were grouped in two groups: group 1 consisted of two classes - 321 Natural Grasslands and 231 Pastures which are assumed to be type 1 HNV farmland (extensive grasslands); and a second group consisted of the remaining 6 classes assumed to comprise type 2 HNV farmland – CLC codes 221 Vineyards, 222 Fruit trees and berry plantations, 324. Transitional woodland shrubs, 241 Annual crops associated with permanent crops, 242 Complex cultivation patterns, 243 Land principally occupied by agriculture, with significant areas of natural vegetation.

After merging the data into these two groups, these were overlaid with the PBA, PA and IBA layers. The main goal of this exercise was to create a layer with polygons fulfilling one of the following preconditions:

- To be located in one of the PBA, protected areas or IBA layers; AND
- To belong to the first group of CLC classes and thus to result in type 1 HNV farmland; OR
- To belong to the second group of CLC classes and thus to result in type 2 HNV farmland.

The map of potential HNV farmland areas in the Republic of Macedonia is not a final and definitive one, but a preliminary draft version using the available data within a limited time frame and budget. Therefore this broad identification should be considered as indicative only and further analysis in the future is needed.



Table 3.3. First (rough) classification of HNV farmland in the Republic of Macedonia

HNVF type	Area (ha)	% of the agricultural land (2008)
HNV farmland Type 1 (Permanent grasslands)	386,267	36%
HNV farmland Type 2 (Mixed utilization)	126,321	12%
Total	494,588	48%

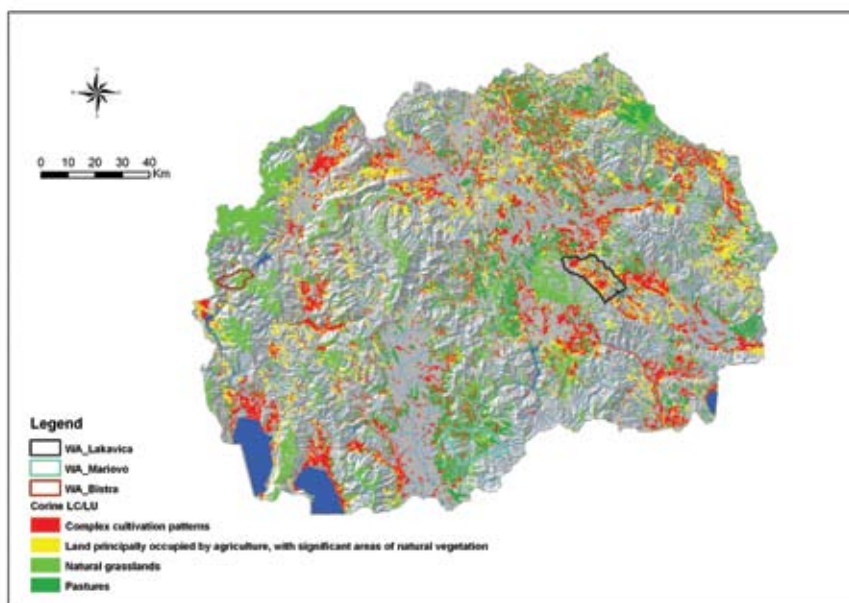


Fig.3.2. Potential HNV farmland in the Republic of Macedonia



3.4. Case study areas

The project focused on 3 case study areas to identify the biodiversity and other “hidden values” of HNV farming systems and the main threats faced by them. The areas examined were:

- **Mariovo** - Bitola area,
- **Region of Reka** - Mavrovo National Park
- **Lakavica region** - along the river Lakavica (Region of Stip).

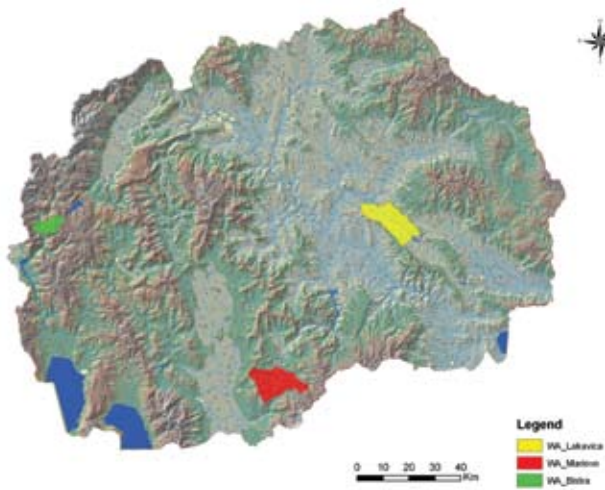
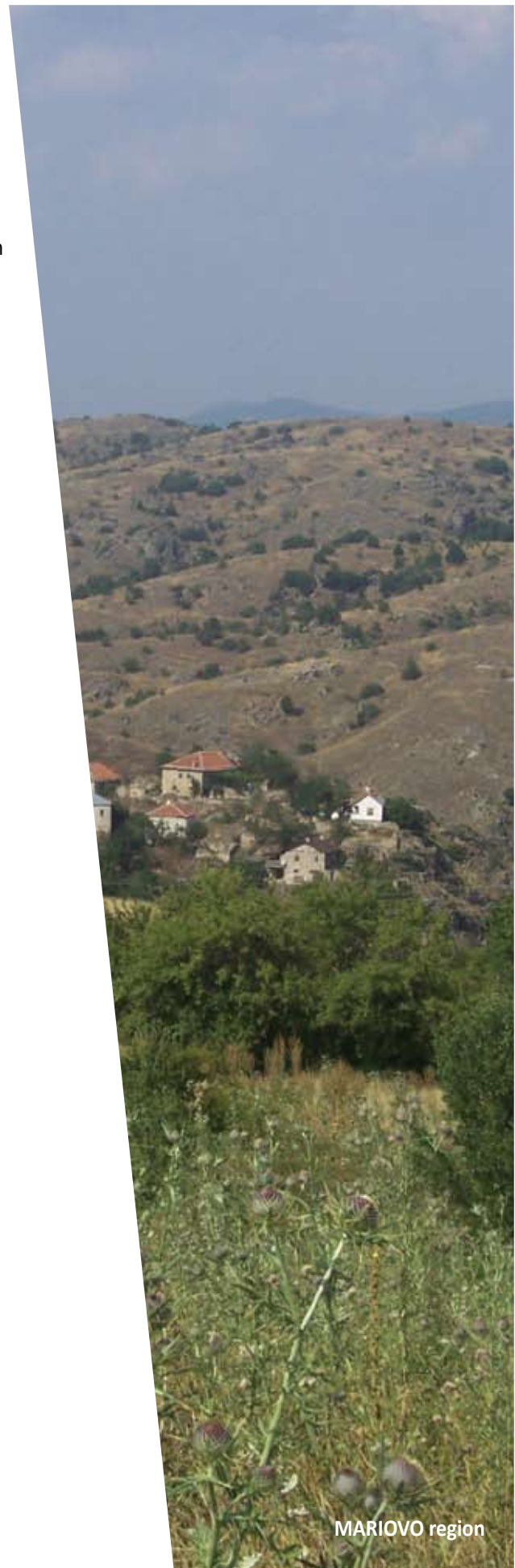


Fig.3.3. Case study areas



3.4.1. *Mariovo region*

Short description of the region

Mariovo is situated in the Central part of the Republic of Macedonia. Its total area is 1,038 km² and the average elevation is 1,090 m. Mariovo is one of the most isolated regions in the Republic of Macedonia; from Bitola there is only one asphalt road which leads to the village of Rapes, whereas the rest of the villages are reachable only by dirt roads. Administratively, Mariovo is divided into three areas: Prilep, covering an area of 495 km² (47%); Bitola, accounting for 333 km² (32%); and Kavadarci, covering 210 km² (20.3%). There are no transport links between each of these areas.

According to the latest census (2008), the total population is 1,160 people, of whom 1,148 are ethnic Macedonians (98.88%). The population is of "Brsjak" origin and is fairly poor, but highly intelligent and hardworking. The local economy and livelihood of the people are based on animal husbandry. The hard living and working conditions have led to high levels of migration to the surrounding towns or other regions. As a result, Mariovo today has an increasingly ageing population (>60 years of age).

The 222 km long Crna River flows through the region, and the Skochivir gorge which is 100 km long gives this region a specific character. Mariovo is known by different names, depending on which side of Crna River the land is located - Malo Mariovo is on the left hand side of the river, going downstream and Staro (Golemo) Mariovo is the area to the right hand side of the river..

The study was carried out in the Bitola part of Mariovo, which features a large number of villages including: Makovo, Rapes, Staravina, Gradeshnica, Zovikj, Grunishte, Budimirci, Orle, Brnik, Iveni and Petalino (Table 5). A number of these were visited as part of the project (Makovo, Rapes, Staravina, Gradeshnica, Zovikj and Grunishte), where there stock-breeding farms exist and there are possibilities for developing rural tourism. In the past Mariovo used to be a lake (lake Mariovo) the center of which was in today's villages of Staravina, Zovikj and Gradeshnica, where fossils from that time, for example clams and crabs can be found.

Nature values of the area

Mariovo is a region that contains a wealth of biodiversity, important landscapes and species of conservation interest.

Although it is not included in the National System of Protected Areas, the area is completely within the Emerald Area of Special Conservation Interest "Mariovo" under the Site Code: MK0000032. The whole region is designated as an Important Bird Area and an Important Plant Area.

Two Corine Biotopes¹ sites are partly included or into close neighbourhood with the territory of the Mariovo Region:

- Staravina Region, Corine Biotopes Site Severna Stena, under the Site Code: P00000032
- Staravina Region, Corine Biotopes Site Kajmakchalan, under the Site Code: P00000033

Wooded areas in the region are characterized by Mediterranean species of fauna. These are distributed across the region, with more sensitive species found in the lowland areas and more common species at high altitudes (up to 1,200m). The oak and/or beech woodlands situated in the lowlands are associated with fauna of greatest conservation importance.

Another group of characteristic fauna (classified as the Eremial group), includes species that originate from the Black Sea-Caspian Region that have adapted to survive in dry steppe-like and semi-desert conditions and species from the Aegean-Anatolian semi-desert areas. In the Mariovo Region these species are mostly present within the Crna Reka river valley.

Species of Boreal (Siberian) fauna are less common in the Mariovo region. Where they do exist they inhabit the higher altitudes of the Nidze/Kajmakchalan mountains, descending into the valleys during the winter.

Table 3.4. Assessment of the fauna species in Mariovo region

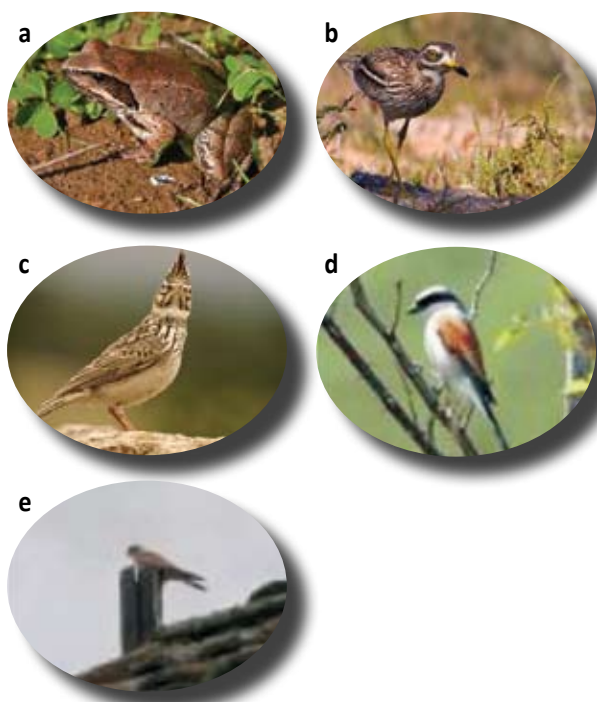
Representative taxonomic groups	Number of species
Crustaceans (Crustacea)	85
True Bugs (Heteroptera)	50
Butterflies & Damselflies (Lepidoptera)	45
Amphibians (Amphibia)	11
Reptilians (Reptilia)	19
Mammals (Mammalia)	19
Birds (Aves)	84
Total	313 species, including birds

¹ Corine Biotopes database is an inventory of major nature sites initiated by the EEA to enhance reliable and accessible information about vulnerable ecosystems, habitats and species of importance and to act as background information for Community environmental assessment.

Table 3.5 Species of European conservation importance in Mariovo region

Conservation legislation	Total number of species	Types
The Habitats Directive		
- Annex II	15 species of Community Interest	one (1) Crustaceans species two (2) Amphibian species five (5) Reptilian species seven (7) Mammal species
Annex IV	34 strictly protected species	one (1) Butterfly species seven (7) Amphibian species 16 Reptilian species 10 Mammal species
The Birds Directive		
Annex I	26 Bird species	

There are 5 key species associated with grass ecosystems and HNV farming for the region of Mariovo: the greek stream frog (*Rana graeca*), stone curlew (*Burhinus oedicephalus*), crested lark (*Galerida cristata*), red-backed shrike (*Lanius collurio*) and lesser kestrel (*Falco naumanni*)

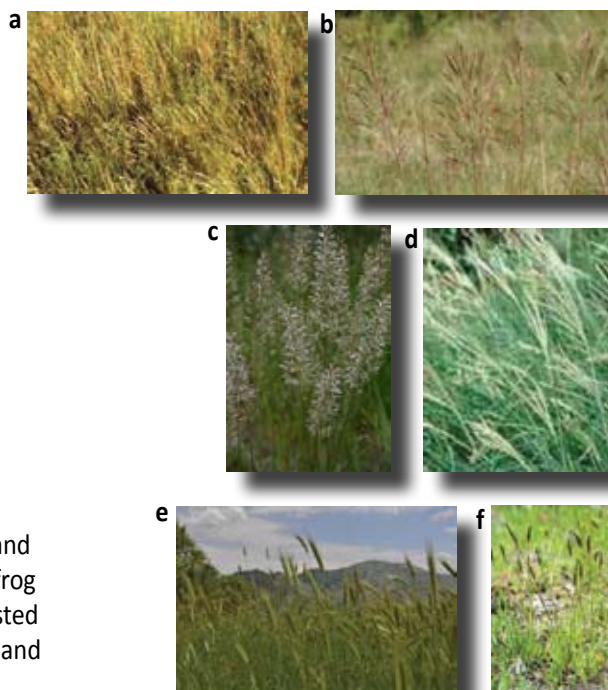


Pictures 3.1. a) Greek stream frog, b) Stone curlew, c) Crested lark, d) Red-backed shrike and e) Lesser kestrel

Land use and farming systems

The region mostly comprises pasture – 13,403 ha (40%), followed by forests – 11,935 ha and arable land – 7,406 ha (22%). Grasslands in Bitola, as in Mariovo region in general, are particularly species diverse. A number of different plant communities exist, associated

with different forest types. The pastures consist of different dominant grass species, including those with *Agrostis vulgaris*, *Festuca pseudovina*, *Koeleria macrantha*, *Chrysopogon gryllus*, *Andropogon ischaemum*, *Haynaldia villosa*, *Anthoxantum odoratum* and *Deschampsia caespitosa*.



Pictures 3.2. a) *Festuca pseudovina*, b) *Chrysopogon gryllus*, c) *Koeleria macrantha*, d) *Andropogon ischaemum*, e) *Haynaldia villosa*, f) *Anthoxantum odoratum*

The main economic activity for the population of Mariovo is animal husbandry. This has been associated with low production levels in the past, but these have started to increase in recent years. Local breeds of cows and sheep are mainly raised in a traditional manner. In the 1950s the local sheep breed was crossed with more productive breeds, such as the “Wirtemberg”, “Pramenka” and “Merino”. Herds graze extensively and are moved from summer to winter pastures. Shepherds work “from St. George’s Day to St. Dimitrija’s Day” (May - October).

Cattle-breeding has less of a history in the region. The “Busha” was the main breed raised, which produced little milk and was mainly used for selling calves. However, there has been significant out-migration from the area over the past 20-30 years, and those who remained in Mariovo started developing the stock-breeding industry in the region. Today, the following quantities of products

are produced annually in Mariovo: 1,000 t of meat, out of which 300 kg of lamb, 300 kg of goat meat and 400 kg of beef; 1,200 t of milk, 300 t of cheese and 150 t of wool. One third of total production is used for subsistence purposes needs, with the remaining two thirds being sold off farm.

A key characteristic food product from Mariovo is the widely known “hard” cheese with a long tradition of many different types of production, known under their folk names of “bieno”, “yellow” and “old” cheese. It is specific for the fact that it is made during the late lactation period, whereas white soft cheese is made out of the other milk. Every household makes hard cheese for their own consumption during the winter period.



Picture 3.3. Draining of cheese

An interesting and expanding sector is bee-keeping, owing to the favorable geographical, climatic and floristic/vegetation conditions. The excellent conditions, including the availability of high quality pasture for the bees, are preconditions for developing of the sector. The endemic breed of *Mariovo bee*, that can live only in the geography and climate symbiosis of Mariovo, is another proof of the specificity of this region and of its importance for both biological diversity and HNV farming.

The local farming systems in the region today can be divided into three main types.

- Subsistence and semi-intensive sheep breeding which has the longest tradition in the region and relies on traditional grazing systems.
- Extensive mixed dairy farming (cows, sheep and goats) is practiced by almost 55% of the families in the region. Due to the difficult winter conditions there is a need for additional fodder, so the farmers produce cereals: wheat, barley, rye and oats. Fruit and vegetable production is not common and only produced for own consumption. Only a few of households have irrigated crops and plantations, thus yields are low, often below national average.
- Extensive livestock farming (mainly cattle breeding and in a few cases sheep breeding as well) is practiced by 45% of the farms. Cattle are grazed near the settlements or in the mountains. The typical cow-calf (suckler cow) system is practiced.

Identification of HNV farming systems

Potential HNV farming systems in the Bitola part of Mariovo are presented in Table 3.6.

Table 3.6. Potential HNV farming systems – key characteristics

Farming systems	Key characteristics	Traditional breeds and sorts/ populations
Subsistence and semi-intensive sheep-breeding	Traditional raising with seasonal grazing (summer-winter), with supplements of concentrated feed during winter	“Ovcepolska” sheep breed and its crossbreeds with “Merino” and “Wirtemberg”
Suckler cow system	Cows graze near the villages or at the hilly-mountainous pastures	“Busha” breed and its crossbreeds with at least 20% of “Busha”
Extensive mixed dairy farming	(1) Combination of raising cows, sheep and goats for milk; (2) farmers grow cereals: wheat, barley, rye and oats (for winter supplements); (3) a low number of households have systems for irrigating crops and plantations, but the yields are below the average or close to minimum.	

Description of farmed habitats

The Bitola part of Mariovo includes various habitats such as terraces, semi-humid meadows, natural and semi-natural dry grasslands with extensive grazing. Vertical ravines are fairly common. There are also dry pastures, mosaic characteristics of high nature value and grasslands with bushes marking the beginning of successive changes in floristic composition, and oak tree forest on dry soil between the grassland areas. Many of these natural habitats have high significance for the overall biological diversity in the region. Two main types of HNV farmland can be found: HNV Type 1 and in certain areas HNV Type 2 (Table 3.7.).

Table 3.7. Type of HNV farmland in the Bitola part of Mariovo

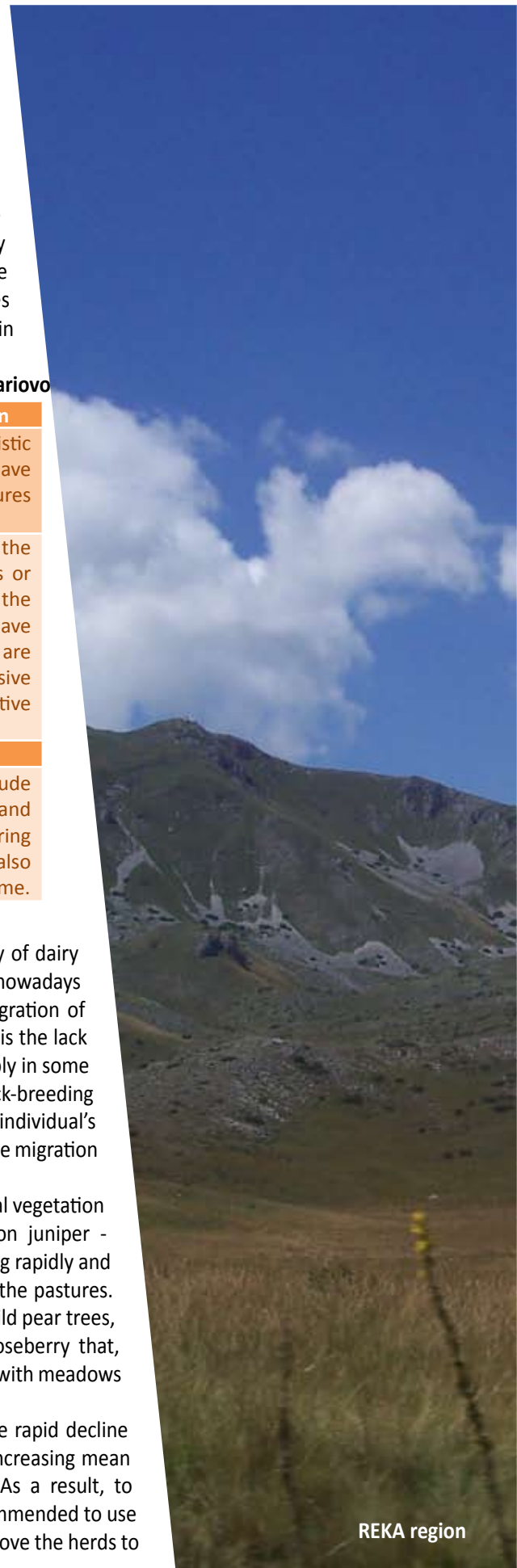
HNV Type1	Natural and semi-natural vegetation
Natural grasslands	Pastures with typical floristic composition, although successions have already been detected; dry pastures with a rapidly reduced cover.
Semi-natural grasslands	The local population in some of the villages uses the riverine meadows or the plains for extensive grazing by the cattle; these transitional habitats have a large environmental value and are maintained by extremely extensive grazing practices, which have a positive influence on biodiversity.
HNV Type2	Small mosaic formations
Arable areas	Some farming practices also include the cultivation of wheat, barley and alfalfa as feed for the livestock during the winter period. Bee-keeping is also developed and generates good income.

Identifying threats to HNV farming

Once famous for both livestock raising and great quality of dairy and processed meat products, the region of Mariovo nowadays has become extremely depopulated due to the out-migration of the population to urban areas. A key issue in the region is the lack of adequate infrastructure such as roads, electricity supply in some villages, and ponds for water. Bearing in mind that stock-breeding is the sole enterprise in the region, this heavily affects individual's economic situation and livelihood and is the reason for the migration to the towns and resulting land abandonment.

As a result of the decline in the livestock numbers, natural vegetation such as scrubland (in this particular case the common juniper - *Juniperus communis* L.) has started to grow. It is spreading rapidly and is aggressive in the way that is expanding over parts of the pastures. However, besides the common juniper, one often sees wild pear trees, wild plum trees, blueberry, rose-hip, hazelnut and gooseberry that, unlike the common juniper, are food for birds associated with meadows and pastures (permanent or temporary).

Another serious threat to pastures and grasslands is the rapid decline of grass cover as early as the beginning of July due to increasing mean annual temperatures as a result of climate change. As a result, to maintain the biodiversity value of these areas, it is recommended to use the lower parts of the grasslands for early grazing, and move the herds to higher pastures as the summer progresses.



REKA region

3.4.2. Reka region

Short description of the region

The Mavrovo region covers almost the entire territory of the Mavrovo national park and the municipality of Mavrovo–Rostushe, as well as the western non-populated part of the municipality of Gostivar. Its total area is 731 km². The territory is mostly mountainous, with high mountains such as Bistra, Deshat, Korab, the highest peak being Korab (2764 m).

The Reka region is situated between Mavrovo and Debar on one side and the border between the Republic of Macedonia and Albania and the Kichevo region on the other side. Geographically, the Reka region borders the southern slopes of the mountain Shar Planina to the north and the northern parts of Deshat mountain to the south. The mountains Korab and Krchin form the western border, and the Bistra and Stogovo mountains form the eastern border. The region is named after the river Radika (Reka Radika) and its tributary Mala Reka (small river). Due to the mountainous character of the area, with numerous peaks higher than 2,500 meters, communication between the settlements takes place along the river courses. The main communication lines are along the rivers Radika and Mala Reka (also known as the Garska). The Reka region consists of several areas: Gorna (Upper) Reka, Dolna (Lower) Reka, Golema (Big) Reka, Mijachia and Mala (Small) Reka. Almost all the villages in Gorna Reka are now abandoned. The majority of the villages that are populated and more developed are situated in Dolna Reka.

The total population of the Reka region is around 10,000, with almost 70% living and working outside the Republic of Macedonia. The main activity of those who live in the region was and still is animal husbandry. Many famous fresco painters and wood carving and mosaic artists originate from this region. It is interesting to note that in the past the white soft and hard cheese made in the region of Reka was exported to North America (through Thessalonica). Before World War II, 2.5 million sheep and more than 150,000 horses used to be raised in this region.

The study included visits to many areas of pasture near Govedarnik, Draga, Banski Dol, Mlache, Smreka and Trebishka Rupa. Most of the pastures are located in the sub-alpine mountainous area, which is characterized by a mountainous climate, featuring a very low number of summer days (12 on average), and a high number of icy days (149) per year. Only the pasture in Mlache is located in a different (cold continental) climatic zone.

Nature values of the area

At a national level, since 1949 the whole territory of the Reka region has been situated within the boundaries of the Mavrovo National Park. As an integral part of the National Park, the region is subject to a range of international designations.

Table 3.8. International conservation designations of Mavrovo region

Conservation Designation	Name	Site number
Emerald Area of Special Conservation Interest	Mavrovo	MK0000007
Important Bird Area	River Radika Catchment	MK002
Prime Butterfly Area (partially)	Radika Gorge	MAK-02
Important Plant Areas	Korab-Deshat Mountains	
	Mavrovo	
	Bistra Mountain	
Corine Biotopes Site	Mavrovo	P0000009

A general characteristic of the fauna of the Reka region is its high degree of species diversity. Faunal elements of Boreal (Taiga) or Siberian origin are dominant, although those of Oreo-Tundral (Arctic-Mountain) origin are also found in the area – mainly relict Palaeo-mountain species rather than Arctic (Tundral) species. Mediterranean and Eremial species (associated with the steppes/semi-deserts/deserts) are less represented.

Table 3.9. Assessment of the 767 fauna species in Mavrovo region

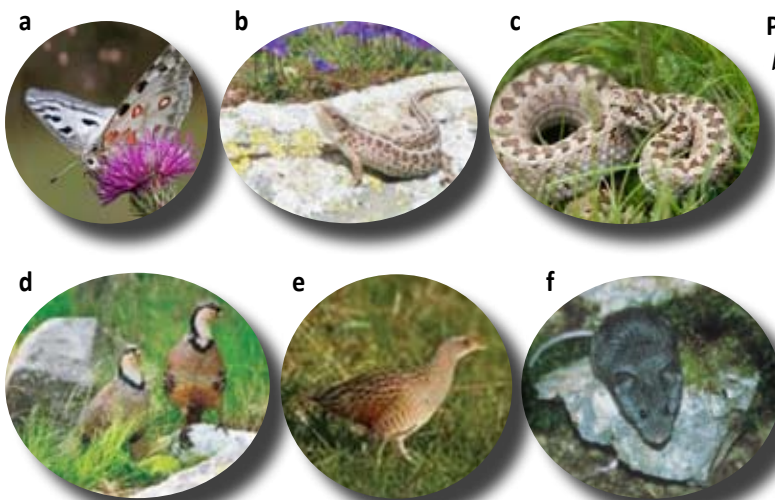
Representative taxonomic groups	Number of species
Spiders (Araneae)	23
Crustaceans (Crustacea)	92
True Bugs (Heteroptera)	141
Butterflies & Damselflies (Lepidoptera)	122
Sawflies, Wasps & Bees (Hymenoptera)	75
Beetles (Coleoptera)	114
Dragonflies & Damselflies (Odonata)	24
Amphibians (Amphibia)	10
Reptilians (Reptilia)	14
Mammals (Mammalia)	48
Birds (Aves)	104
Total	767 species

Table 3.10. Species of European conservation importance in Mavrovo region

Conservation legislation	Total number of species	Types
The Habitats Directive		
- Annex II	16 species of Community Interest	one (1) Crustaceans species one (1) Dragonfly species three (3) Butterfly species two (2) Amphibian species two (2) Reptilian species seven (7) Mammal species
Annex IV	35 strictly protected species	six (6) Butterfly species two (2) Dragonfly species four (4) Amphibian species 10 Reptilian species 13 Mammal species
The Birds Directive		
Annex I	16 Bird species	

Altogether 34 faunal species are ascertained as endemic, of which two (2) species of Spiders, seven (7) species of Crustaceans, 20 species of Beetles, two (2) species of Amphibians and three (3) species of Mammals.

The following seven (7) Key Species of conservation interest are closely associated with grassland ecosystems and HNV farming in the Rekanski Region: the Mountain Apollo butterfly (*Parnassius apollo*), the Sand Lizard (*Lacerta agilis*), Orsini's Viper (*Vipera ursinii*), the Rock Partridge (*Alectoris graeca*), the Corncrake (*Crex crex*), the Balkan Snow Vole (*Dinaromys bogdanovi*) and the Balkan Chamois (*Rupicapra rupicapra balcanica*).



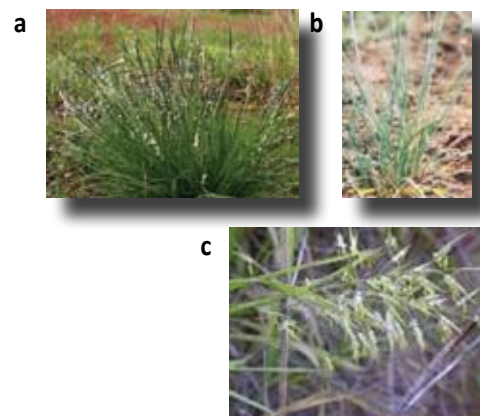
Pictures 3.4. a) Mountain Apollo (*Parnassius apollo*), b) Sand Lizard (*Lacerta agilis*), c) Orsini's Viper (*Vipera ursinii*), d) Rock Partridge (*Alectoris graeca*), e) Corncrake (*Crex crex*), f) Balkan Snow Vole (*Dinaromys bogdanovi*)

Land use and farming systems

Almost 60% of the case study area in the Reka region is covered by forests. Natural grasslands (alpine and high mountain pastures, meadows) are found on 3,203 ha of the area and arable land covers only 370 ha, with significant areas under natural vegetation.

Pastures are characterized by a lush grass cover and their species composition varies with altitude as the types of forest they are associated with changes (forests comprising beech, Norway maple and wych elm are all found as well as sub-alpine beech forests at higher altitudes).

The pastures are home to the common juniper (*Juniperus communis*, *J. nana*), raspberries, stinging nettle (*Urtica dioica*.), single-seeded hawthorn (*Crataegus monogyna*), bilberry (*Vaccinium myrtillus*), dog rose (*Rosa canina*), woolly blackberry (*Rubus tomentosus*) and others. The most common pastures are those dominated by grass species *Nardus stricta*, *Festuca herzegovinica*, *Bromus riparius*, *Deschampsia caespitosa*, and *Anthoxantum odoratum*.



Pictures 3.5. a) *Nardus stricta*, b) *Festuca herzegovinica*, c) *Bromus riparius*

Pastures are used for only 4.5 - 5 months in the year. In the late summer period the herds are moved down to the lower areas where the animals receive feed supplements consisting of straw and hay, most of which is sourced from the meadows and pastures. Grazing is extensive and animal husbandry is the only source of income for the population. The pastures are also used during summer for grazing sheep from other regions of Macedonia.

Many written documents confirm the long traditions of livestock breeding in the region. In the past there were 32

sheepfolds on Bistra mountain, of which only 9-10 still function today, as a result of significant declines in sheep numbers. According to Dr. Toma Smiljanic the mountain was divided into “units” with clear borders. Every unit had a farm. In 1932, there were 60,600 sheep and 1,210 horses on the mountain, with as many as 90,000 sheep grazing on Bistra during the summer period.

The current local farming systems can be divided into two types:

- Extensive livestock breeding (mainly sheep and few cattle). Households generally raise cattle for their own needs. Mountainous and high mountain pastures are used by farmers under concession (50 denars per head per year), and the grazing is from April until the end of September. During the winter months livestock are kept in sheepfolds and grazed in the vicinity of the village. The livestock is provided with additional feed, comprising straw and feed prepared from corn, wheat and oats. In this region the farmers produce and prepare the fodder by mowing, collecting and baling the

hay from natural meadows and pastures. This is especially useful for the meadows as it prevents the invasion of the surrounding scrub species. The shepherds have built sheepfolds on the high mountain pastures and prepare high quality products there (yogurt, white cheese, yellow hard cheese, cottage cheese).

- Extensive mixed farming dominated by cattle breeding near to the villages. The farmers’ income comes from milk and its processing. During the winter the cattle are provided with additional feed including meadow hay and concentrated fodder, prepared from wheat, barley, rye and oats which are mainly produced for the needs of the farmers. Old traditional varieties of plums, Turkish hazel, rosehip, cornel tree and other plants are located in the villages and their surroundings. Forest fruits are collected, processed and consumed.

Identification of HNV farming systems

Potential HNV farming systems in Reka region are presented in Table 3.11.

Table 3.11. Potential HNV farming systems – key characteristics

Farming systems	Key characteristics	Traditional breeds and sorts/ populations
Extensive sheep breeding	Nomadic type of sheep-breeding by moving the herd from summer to winter pastures. Sheepfolds are located on the pastures. Traditional processing of the milk into white mature cheese salted in brine. The highest sheepfold in this region is at 1937m above sea level	(1)Sharplaninska and Ovcheploska and crossbreeds thereof. (2)Endemic botanical composition of the pastures and grasslands
Seasonal/transhumance sheep breeding	The sheep are moved (transported by train) from some areas of the country (dry grass cover) during the summer period.	Crossbreeds between Sharplaninska and other breeds.
Extensive cattle breeding	Cattle are grazed in the vicinity of the the villages. Farmers have small land plots where they grow (produce) wheat, barley, rye and oats for nutritional supplements during the winter.	Old varieties of plums, Turkish hazel, rosehip, cornel tree, etc. located around the villages.
Collection of herbs and forest fruits	The fruits are collected during the summer. They are either sold fresh or are processed for one’s own consumption and needs.	

Description of farmed habitats

The Reka region is almost pristine nature. Part of it is actually a protected area – the national park Mavrovo– with high mountains and wide pastures with a very lush grass cover that looks like a green “carpet”. Pastures are natural and located on mild or steeper

slopes. In some places they are interspersed with a geological substrate that has emerged on the surface and with juniper. Forest fruits such as raspberries, rosehip and others can be found along the edges of the pastures. The area is dominated by HNV farmland Type 1 (Table 3.13.).



Table 3.12. Type of HNV farmland in the Reka region

HNV Type1	Natural and semi-natural vegetation
Natural grasslands	Lush grass cover with endemic botanical composition. Succession is already starting to take place in some areas, where juniper has started to appear, which tends to expand rapidly and change the species composition of the pastures.
Semi-natural grasslands	The local population in some of the villages, whose livelihoods are based on stock-breeding, raise only a few heads of cattle that graze on the nearby semi-natural grasslands. Grazing happens throughout the year, and in the winter months it is supplemented by adding concentrated feed made of cereals produced for meeting one's own needs. Bee-keeping is also developed, though not just for domestic needs but for an additional income as well.

Identifying threats to HNV farming

In the case of the Reka Region, the landscapes of significant aesthetic value with high species richness, produced by the interaction of local people and nature over centuries through traditional HNV pastoralism, are slowly disappearing. The idyllic, flowering wet meadows near the village of Bitushe, as well as along the Tresonechka Reka River that were regularly mown in the past for haymaking now are mainly abandoned.

The management of high-mountain pastures by traditional sheep and cattle grazing practices has severely declined. This has led to former grasslands undergoing successional change into scrublands and forests. As a result of a lack of grazing, the mountain pastures have become overgrown with tall grass that dry up during the late summer, which creates a fire hazard. This was illustrated a few years ago in the Galicica National Park, when large areas of tall grasslands in the high mountain belt were completely burned, causing significant damage to the flora and fauna. With climate change, the risk of forest (dry grassland) fires will become ever greater in the future. On the contrary, if the pastures are grazed, than the short swards are less exposed to fires.

There is no large distribution or purchase center in the Reka region for milk and dairy products and this poses a serious threat for the continuation of livestock farming in the region.

Another threat for the biodiversity of the Reka Region is the plan to construct a hydro-electric power plant at Boshkov Most. It is intended that the water will be collected from the Mala Reka Watershed, by capturing the head waters of all tributaries and by channeling this through pipelines into the power plant. This would lead to the river beds of the mountain rivers becoming almost dry, which would lead to very little water being available for the wet meadows along the rivers. Within the Mavrovo National Park a similar situation already exists where the head waters of the Adzina Reka River are completely captured and the river bed has completely dried out along its entire length.



LAKAVICA region

3.4.3. *Lakavica region*

Short description of the region

With a total area of 8,465 ha, the Lakavica region extends to the south-east of the town of Stip in the region between Stip and Radovish, between two mountain ranges: the western slopes of Plachkovica known as Jurukluci and the north-eastern slopes of Konechka mountain, known as Cert. The biggest river is Lakavica, which cuts through the area and flows into the river Vardar. The highest peak in the area is Goloshac Chanak Tepe (923 m). The region experiences two main types of climate: moderate steppe climate (50%) and steppe climate (40%). The mild slopes and the elevation of around 600 m have created a favorable climate for various types of vegetation. This region encompasses valleys and low hills as well.

Eleven villages were visited as part of the case study, all between 299 and 599 m altitude. These were: Geren, Erdzelija, D. Vrashtica, Selishte, Vrapchalishte, Matevec. Makriman, Dolensko, Ushite, Cheshmite, Gramadi and Piperovo.

Nature values of the area

Although the Lakavica Region is important from a biodiversity point of view, it is not included in the National System of Protected Areas and it is not designated as Emerald Site. It is partly included within the territory of the “Manoto & Lakavica” Important Bird Area. However the region borders Ovche Pole, which is proposed as a special site of community interest according to the national report on Emerald important areas.

The fauna of the Lakavica Region is only partially investigated, and information related largely to vertebrates and certain invertebrate taxonomic groups. The fauna which is recorded is notable for its richness and heterogeneity: Mediterranean species exist alongside Euro-Siberian species and there a variety of species also exist that are typical for steppes and semi-desert areas. From a bio-geographical point of view, two types of fauna exist: Eremial and Arboreal. Eremial species include those that originated from the Black Sea-Caspian region and are adapted to survive in dry steppe-like and semi-desert conditions as well as species from the Aegean-Anatolian semi-desert areas. In the Lakavica Region these species are mostly present within the *Sub-Mediterranean* part of the region (up to 600 m above sea level). Arboreal species consist mainly of those associated with the Mediterranean, which encompasses species connected with broadleaved woodlands. Within the Lakavica Region the species that belongs to this group are present in the *Sub-Mediterranean* part of

the region (up to 600 m) and the *Sub-Continental* part of the region (600-1200 m).

Table 3.13. Assessment of the 332 fauna species in Lakavica region

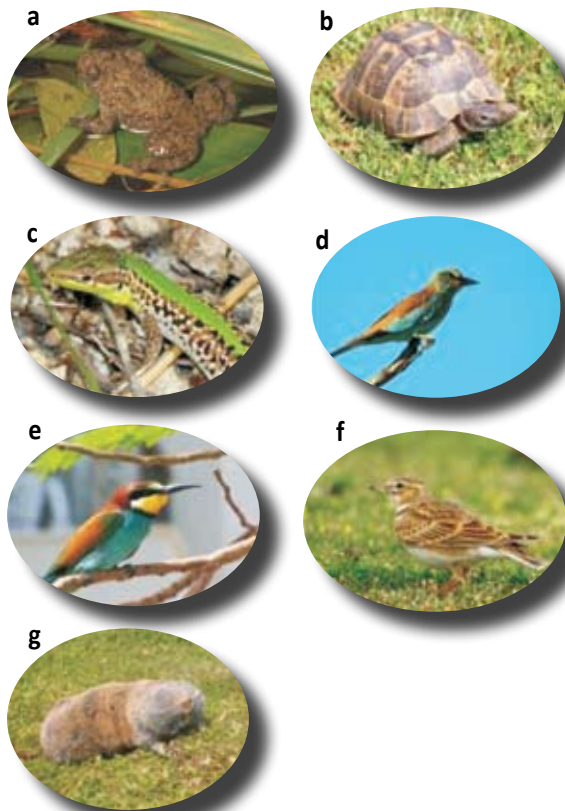
Representative taxonomic groups	Number of species
Crustaceans (Crustacea)	86
True Bugs (Heteroptera)	55
Butterflies & Damselflies (Lepidoptera)	23
Grasshoppers & Crickets (Orthoptera)	39
Amphibians (Amphibia)	9
Reptilians (Reptilia)	14
Mammals (Mammalia)	28
Birds (Aves)	78
Total	332 species

Table 3.14. Species of European conservation importance in Lakavica region

Conservation legislation	Total number of species	Types
The Habitats Directive		
- Annex II	12 species of Community Interest	one (1) Crustaceans species two (2) Amphibian species four (4) Reptilian species five (5) Mammal species
Annex IV	26 strictly protected species	one (1) Butterfly species five (5) Amphibian species 12 Reptilian species 8 Mammal species
The Birds Directive		
Annex I	22 Bird species	

Altogether eight (8) faunal species are ascertained as endemic, of which four (4) species of Crustaceans, one (1) species of Amphibians and three (3) species of Reptiles.

The following seven (7) key species of conservation interest are closely associated with grassland ecosystems and HNV farming in the Lakavica Region: the Balkan Yellow-bellied Toad (*Bombina scabra*), the Spur-thighed Tortoise (*Testudo graeca*), the Balkan Wall Lizard (*Podarcis taurica*), European Roller (*Coracias garrulus*), European Bee-eater (*Merops apiaster*), Calandra Lark (*Melanocorypha calandra*) and Lesser Mole Rat (*Spalax leucodon*).



Pictures 3.6. a) Balkan Yellow-bellied Toad (*Bombina scabra*), b) Spur-thighed Tortoise (*Testudo graeca*), c) Balkan Wall Lizard (*Podarcis taurica*), d) European Roller (*Coracias garrulus*), e) European Bee-eater (*Merops apiaster*), f) Calandra Lark (*Melanocorypha calandra*) and g) Lesser Mole Rat (*Spalax leucodon*).

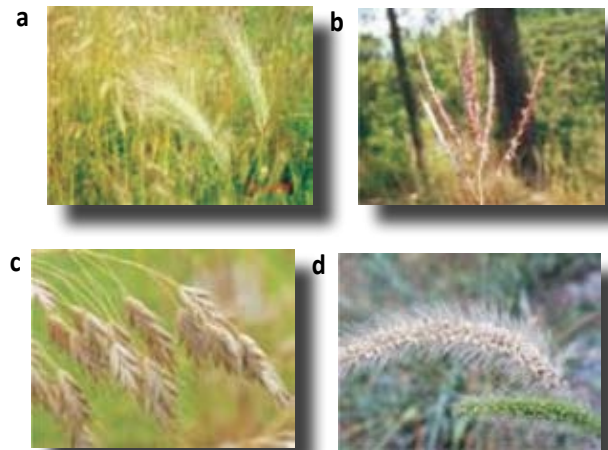
Land use and farming systems

The main economic activity in the Lakavica area has always been stock-breeding, mainly cattle-breeding. Arable land accounts for around 4,338 ha, fragmented into small parcels with different types of cultivation. Almost half the arable land (2,129 ha) form mosaics with natural vegetation and natural borders. Perennial crops cover 12 ha, and small-grained fruits 75 ha. Natural grasslands cover 246 ha, whereas pastures extend over an area of 1,177 ha, mainly located in the flat parts of the region, but also found on the slopes of Konechka Mountain and west from the Lakavica River. Some of the cropped area is irrigated (463 ha), using water from the Lakavica River and its tributaries.

Pastures are located in the continental-Mediterranean belt with a characteristically low annual precipitation of 460-583 mm (the average is 507 mm), which is the lowest in the Republic of Macedonia. As a result, this region is the most arid area in the country, which has resulted in the emergence of drought and heat tolerant vegetation communities. Livestock graze throughout the year, since snow almost never stays on the pastures due to the low altitude. The use of the pastures is extensive (95%), but farmers also feed the animals with nutritional supplements consisting of hay, sourced from the natural meadows and grasslands, as well as concentrated feed in the form of a mixture of barley and alfalfa/ wheat or barley and chaff, with some stock-breeders raising red clover and alfalfa (for hay). These nutritional supplements are produced by the farmers themselves in 70% of cases. The pastures tend to be a long way

from natural water courses, except for a small number which are close to the Lakavica River. There are no ponds on the pastures, which poses a serious problem in terms of livestock access to water.

The grass species dominating the pastures are *Haynaldia villosa*, *Andropogon ischaemum*, *Bromus secalinus* and *Setaria glauca*.



Pictures 3.7. a) *Haynaldia villosa*, b) *Andropogon ischaemum*, c) *Bromus secalinus*, e) *Setaria glauca*

According to the available data (2007) and the information obtained from the farmers interviewed, 3,500 sheep and 2,600 cows are grazed on the pastures and grasslands in Lakavica. These numbers are increasing, stimulated by the availability of direct payments for farmers.

The dominant farming systems today can be divided into two types:

- Mosaics consisting of small arable land plots, orchards and gardens, in combination with semi-natural vegetation, are created by the use of different farming practices. The most common crops grown are cereals, vegetables and forage crops as well as traditional fruit trees – individual or groups of several trees (peaches, plums, apples, apricots, black mulberry) - scattered around the semi-natural grasslands and meadows. The crop production output is almost equivalent to livestock production. Chemicals are hardly used.
- Extensive livestock breeding takes place on about 65-70% of the farms. The majority

of households are involved in sheep breeding. They usually sell the milk rather than processed products, due to the poor milk quality. Those households that breed cattle tend to do so for meat production. Frequently they use the surrounding hilly mountain pastures where livestock are grazed throughout the year. During the winter months the livestock is given supplementary feed with

concentrated fodder produced from ground wheat, barley, rye and triticale, occasionally with the addition of bran and with alfalfa hay, and very occasionally hay with red clover.

Identification of HNV farming systems

Potential HNV farming systems in the Lacavica region are presented in Table 3.15.

Table 3.15. Potential HNV farming systems – key characteristics

Farming systems	Key characteristics	Traditional breeds and sorts/populations
Extensive sheep breeding	The sheep are grazed throughout the year. In the winter they are provided with supplementary feed. The sheep are bred for milk but the milk quality is not high	
Extensive cattle breeding (cow-calf system)	Cattle are grazed in the vicinity of the the villages throughout the year and are provided with supplementary feed during winter months.	Busha cow and crossbreeds with at least 20% of Busha breed
Extensive mixed farming systems	Farmers are occupied in livestock breeding but also with crop production. The main crops are cereals, wheat, barley and maize (less rye and triticale) and alfalfa. Small scale mosaic landscape is typical for the region.	

Description of farmed habitats

The Lacavica region encompasses a variety of habitats. The steppe character results in dry and semi-dry hilly and mountainous pastures with gentle slopes. Wet pastures are rare, despite the presence of Lakavica

river terraces, semi-wet meadows, etc. Almost everywhere mosaic landscapes exist consisting of pastures with juniper bushes. Unfortunately, the juniper spreads without control on many of them and reduces species diversity.

Table 3.16. Type of HNV farmland in the Lacavica region

HNV Type1	Natural and semi-natural vegetation
Natural grasslands	The Lacavica region has steppe climate characteristics; the lowland pastures are dry and can be used until mid June, after which the livestock grazes on the hilly-mountainous pastures. The hilly-mountainous pastures are used for the grazing of sheep and goats, as well as for making hay. These are mainly small grass-covered areas in afforested zones whose natural value is expectedly high. One can notice that the pastures have started to change with the emergence of juniper, wild plums, wild pears, blackberries, hawthorn and similar vegetation.
Semi-natural grasslands	Farmers with only 20-30 heads of livestock very often have their herds graze in the vicinity of their villages, where there is almost no clear border between the extensive grazing areas and the arable land. It is not rare to see herds grazing on the neighboring meadows and plains beside the rivers.
HNV Type2	Small mosaic formations
Mosaic of arable land and old orchards	Mosaic of small plots of arable land and orchards in combination with semi-natural vegetation: these habitats look like a mosaic of small plots of arable land with different farming practices: cereals, vegetables, forage crops and traditional fruit trees (individual or in a group - peaches, plums, apples, apricots, black mulberry) in combination with semi-natural grasslands/meadows. The natural field boundaries such as hedges and trees are also typical for the landscape in the region.

Identifying threats to HNV farming

Lakavica Region is faced with different threats to biodiversity. Since it is situated within the most arid region in Macedonia, one of the main livelihoods for local people is sheep breeding. However, the unsustainable management practices of sheep breeding in the past, through overgrazing of dry grassland has caused soil erosion and about 38% of the land is considered to be significantly eroded. Transformation of grasslands into arable land is also present, despite the low soil quality. Pastures are usually covered with red juniper *Juniperus oxycedrus* and *Paliurus spina-christi* that represent a serious threat for the successive changes in the composition of pasture vegetation. Other woody species and shrubs are occasionally present also, such as common juniper (*Juniperus communis*), wild pear (*Pyrus pyraster*), drain (*Cornus mas*), wild plum (*Prunus cerasifera*), Hawthorn (*Crataegus heldreichii*), one-seed Hawthorn (*Crataegus monogyna*), Rose (*Rosa canina*), hazel (*Corylus avellana*), and others. If certain measures are not taken, the invasion of fast spreading juniper can lead to permanent changes in the floristic composition of the pastures in the area.

Climate change is leading to higher temperatures in the region, accompanied by dry periods that start as early as in the beginning of June, meaning that the grass is already dry by July. As a result, there is low grass production and significantly reduced nutritional value, and thus livestock breeding is under threat. All these factors are reflected in a reduced quality of the milk and dairy products; in the case of cattle this requires additional expenditure on nutritional supplements in terms of cereals and forage crops.

Marketing of dairy products in this region is also a significant problem. Although the price of the products is the cheapest compared to other parts of the country (220 den / kg) there is a lack of large traders, unions and companies to facilitate sales. Problems also exist in relation to the administrative procedures for the registration of dairies, largely linked to meeting the minimum standards of hygiene and good manufacturing practice which require huge investments. Another problem is the lack of land available to rent, which directly increases the expenditure of farmers, since they cannot cover completely their needs for fodder and have to buy it in instead. It should be stressed that there is no large purchase center in the Lakavica region for milk and dairy products, nor is there a distribution center. Were they available, they would mean a great deal for the population and for their poor economic situation and social status.



3.4.4. Identification and mapping of HNV in case study areas

The identification of HNV farmland in the case study areas was done in a more detailed manner as compared to the national mapping. In the first stage a field survey was performed in all of the three case study regions. During the field work, GPS coordinates were collected from the areas identified as semi-natural and natural grassland and considered to be of HNV. Information for the all types of land use on the visited sites was also gathered.

Topographic and geology maps were completed for all three regions, scanned and geo-referenced together with the digital elevation model (DEM) with a 20 m resolution. The delineation of the case study areas was carried out by overlapping these layers.

The GPS coordinates were uploaded in GIS software, creating separate GIS layers. These layers, together with the CORINE Land Cover layer, were overlapped over high resolution ortho-rectified aerial photographs. The aim of this task was to verify the collected field data in terms of precise identification of pastures and natural grasslands and to perform corrections of the boundaries of the CLC polygons which fall within the test areas.

In the next step of elaboration, thematic forestry maps of the area in hard copy for the Lakavica and Bistra region were digitized and overlapped with the improved CLC layers for additional correction of CLC layer. After this correction procedure, classes indicating forests were extracted.

In the final stage of the elaboration, CLC were reclassified and a new layer containing classes indicated in Table 3.17. was derived.

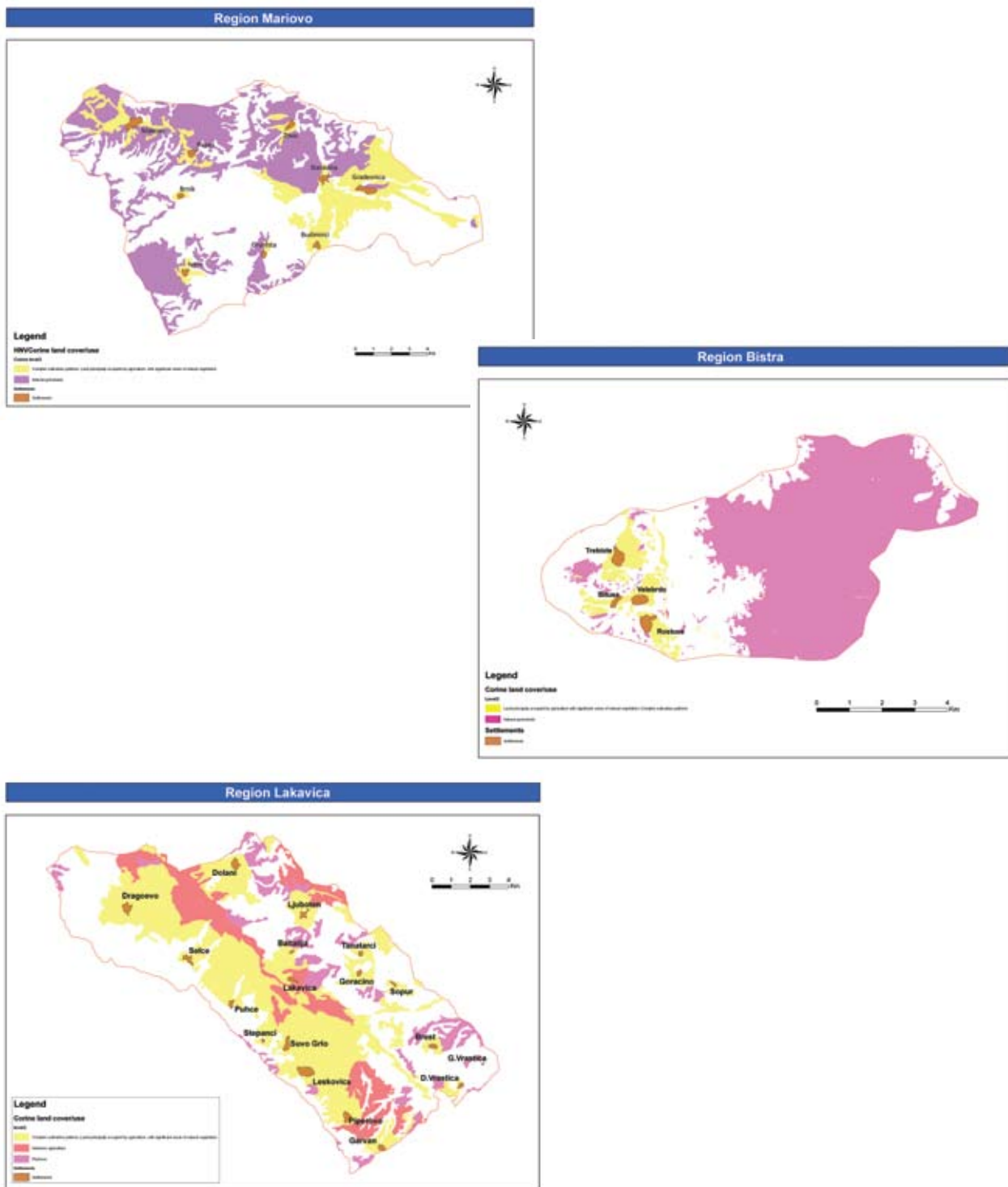
In the final stage of elaboration, CLC classes were grouped in three groups:

1. Intensive agriculture (for Lakavica region) consisting of 211, 212, 221 and 222 CLC classes,
2. Mixed utilization consisting of 242 and 243 CLC classes
3. Permanent grasslands consisting of 321 and 231 CLC classes

Table 3.17. Rough classification of HNV farmland in the case study areas

HNV type	Mariovo (ha)	Lacavica (ha)	Mavrovo (ha)
HNV Type 1 (Permanent grasslands)	5567	1424	3203
HNV Type 2 (Mixed utilization)	2660	6665	370
(Potentially) HNV Type 2/3 (Intensive agriculture)		2247	
Total HNV farmland	8227	10336	3573

Fig. 3.4. Maps for the three case study areas



4. Chapter

Identifying the problems and the needs of HNV farmers in the Republic of Macedonia

Vyara Stefanova, Dimce Damjanovski, Petar Andonov

This chapter outlines the results of a series of discussions with farmers and other stakeholders that took place during the project. Three seminars with farmers in the case study areas were organized in November 2010. In March 2012, six round-tables with different stakeholders (regional authorities and services, NGOs, farmers, foresters, etc.) were carried out in Pehchevo, Probistip, Lacavica, Rostushe, Novaci and Ohrid. The main messages received are presented below.

4.1 Financial and marketing issues

Farmers in all of the case study areas are facing problems for the continuation of their agricultural activities. The sale of produce is still their main source of income but usually the larger share of profit goes to the middle man, trader or the processor. New hygiene and veterinary rules that need to be adopted by the farmers threaten to make most of the extensive and subsistence farmers “outlaws” and push them to market their produce outside the official system. Therefore it is very important: a) to make clear rules and distinctions for different types of the farming systems, and b) to allow the continuation of direct on-farm sales. Most of the farmers expressed also the urgent need to create/reestablish purchase centers (points) in villages thus helping them to sell their produce.

One way to receive a good price for their produce is to form farmers associations. This is especially important for livestock breeding farmers, where prices of milk are constantly changed and the payments are significantly delayed in some regions, although other types of farmers may also benefit.

The need to cooperate and form producer groups that will provide them with better market access is recognized by some of the farmers. However, there is a reluctance to work cooperatively and hence a lack

of initiatives in this area, mainly as a result of the existing post-socialist social heritage related to forced cooperation in the past. One of the proposed solutions was to introduce a scheme for support for the creation of pilot farmer producer groups, especially ones farming using traditional production methods.

Another big issue that is common for all rural areas is the lack of access to investment funds. The financial powerlessness of farmers for making new investments that they need to allow them to fulfill the newly introduced standards, improve the quality of their products and increase the volume of their production, is one of the farmers’ greatest problems. Even though a credit line for rural financing is provided by the Macedonian Bank for Developmental Support, such credits are still very difficult to obtain.

4.2 Land use issues and property rights

Most of the HNV farmers are rearing livestock and the provision of feed for the animals is one of their main concerns. It is very important to them to have access and rights to use grasslands, as these are their main forage resource. Pastures in the Republic of Macedonia are to a large extent owned and managed by the Public enterprise for pastures management. Farmers apply to the public enterprise for the right to use the pastures. Upon approval, they sign a contract and pay an annual fee

for the grasslands they are allocated to use. A few of the issues which farmers face in using the grasslands are listed below:

- The lack of cadastral system for the pastures and lack of control of grazing is a significant issue. Often farmers do not know the exact borders of the area for which they have paid for grazing the animals. Thus, in some places the same grassland is used by two or three farmers. In addition, in several cases a contract signed with the Public enterprise gives officially the right to 2 or 3 farmers to use certain pastures, causing conflicts between them as to who is the rightful user. One way to solve this issue is to prioritise the mapping of these pastures in the Land Parcel Identification Systems (LPIS) and to develop new rules on the use of the pastures, including new boundaries and a new classification of pasture types.
- The paths for the mountain pastures, the watering places and the shelters are no longer maintained by the Public Enterprise due to lack of funds, despite the fact that a fee is obtained from the farmer for grazing their livestock on these areas. If the fee is not used to enable livestock and farmers to access the pastures then it will become increasingly difficult to prevent their abandonment. A possible solution is to remove the fee for usage, especially in areas where loss of grassland ecosystems is evident. Another interesting solution proposed during the round tables is to organise voluntary action for clearing the paths and access to the high mountain pastures.
- In some of the areas (Mariovo) the grasslands are also used for hunting and farmers are reluctant to graze their animals there.

Several land property issues were also identified. Most of them are related to problems in obtaining the necessary documentation to enable access to funding schemes and mechanisms. These include:

- Proving the ownership of a farmer's property is a problem due to unresolved issues of establishing ownership status which has been ongoing for many years. Impossibility to obtain the documents proving the land use rights, especially due to the absence of land owners, financial difficulties with the legalization and regulating of the legal status of the land, unfinished court procedures, difficulties in contacts with the local authorities, etc.
- It is difficult to prove actual land use as the LPIS is still not functional. Land that is currently under permanent crops cannot receive a property deed from the Cadastre Agency, because the farmers need to pass a procedure for the conversion of permanent land use of the land and change the land status. Such changes are reported to take a long time to complete.
- A large number of rural areas are not covered by a so called "Spatial development plan" and the farmers there are unable to obtain from the local government the document entitled "Approval for construction" that is required for new investments. Another problem is the need for farmers to have their agricultural land status changed to construction land before they can carrying out any building work, which is a procedure that takes both time and is costly.
- Farmers have a problem obtaining the document entitled "Certificate of compliance of the investment with the Local Development Strategy of the respective municipality" because in some municipalities no such strategy exist.

4.3. Farmers' registration

According to the criteria of the Ministry of Agriculture, Forestry and Water Enterprise, farmers have to be registered as legal entities or individuals in the Single farm register



in order to apply for support. Most of the farmers are not registered because if they do so they will lose their benefits from the social support (pension and disability insurance, health insurance, etc.). A possibility to solve this issue is to propose partial tax exemptions for pension and disability insurance for those farmers producing in marginal areas and difficult conditions. Another proposal put forward during the round table is to differentiate those regions with extensive agriculture and those that are more intensive and to introduce different support schemes for different types of farming. It was also recommended that the registration process should take place in the villages, near the farmers – the possibility of doing this through mobile teams was proposed.

4.4. Infrastructure problems

All farmers met identified the lack of a proper infrastructure as a big constraint to their living and agricultural activities. Developing infrastructure in rural areas (road network, water supply system, medical clinics, retail stores, etc) is much needed in the shortest possible period of time. A significant number of villages are already abandoned mainly due to the lack of such infrastructure. In the border regions such as Mariovo and Reka, the lack of roads and electricity affects both the living conditions of the local population and the development of livestock breeding. Lots of animals are lost, especially during the winter months, because of lack of access to the villages in these areas. Mechanisms for covering the damages experienced by farmers as a result of theft or vultures also do not exist.

4.5. Diversification (quality schemes, branding, tourism)

Farmers in the HNV areas in the Republic of Macedonia are clear that they need to diversify their activities. Several areas of interest were outlined:

- the need for proper legislation and measures to support the branding of products and the introduction of 'designated geographic origin' schemes;
- the further development of organic farming is welcomed by the farmers in HNV areas. Most of them are willing to participate in the existing support schemes (especially additional support per head of livestock), but propose that the digressive support rates should be removed and that different levels of support should be introduced for different crops or livestock.
- conditions and support schemes should be put in place to support rural tourism, bringing both additional revenue for farmers and providing a means to increase the promotion of HNV farming systems;
- supporting the participation of traditional farmers in international, national and regional open days and fairs is also highly appreciated by the farmers.

4.6. Veterinary and environmental issues

Farmers in Republic of Macedonia are faced with another significant challenge which is to comply with the relevant provisions of the newly introduced veterinary and environmental legislation, Code of Good Agricultural Practice, animal welfare and other national regulations.

Apart from the on-farm investments needed to fulfill the standards, farmers are facing problems in obtaining statements and opinions from the different environment and veterinary services. Some municipalities lack an Environment Protection Department, which is the reason for problems with the issuing of the "Certificate of fulfillment of the minimal environmental standards". Documents from veterinary services are obtained with difficulty, often taking a long period of time and farmers report an urgent need to have a Veterinary service in each region.

4.7. Information, training and consultation

Information, training and consultation are important for all farmers in the case study areas. The scope of farmers needs depends on the region and the needs identified were varied, including innovations and technology development, business opportunities and participation in support schemes, legislative requirements, etc. Most of the farmers expressed the opinion that such activities should be organized close to the settlements where their farms are situated.

Overall, the variety and severity of the issues discussed underlines the overall need for a comprehensive approach to address them. Developing agri-environmental payments can only address a small part of the problems and therefore can be regarded only as one of the first steps in that direction.



5. Chapter

Policy recommendations for supporting HNV farming in the Republic of Macedonia. Reference to the potential of agri-environment payments

Suzana Kratovalieva, Dimce Damjanovski, Vyara Stefanova

The concept of HNV farming is a novelty for the Republic of Macedonia, as for most of the countries in South Eastern Europe. Nonetheless, the climatic conditions, the landscape and the extensive character of agricultural practices in the mountain regions of the country suggest that most of the traditional farming systems existing there can be regarded as HNV. However, these traditional systems are exposed to a number of challenges, largely related to the increasing trends towards the cessation of farming activities and land abandonment. An aging population, low income and poor infrastructure are all factors contributing to these trends. Support through public policy is needed to allow communities to remain viable and farmers to continue to make a living and to provide society with a whole range of benefits. These challenges require an integrated package of measures that work together to the benefit of both the environment *and* local people. Additionally, the successful implementation of such measures requires a genuine willingness to make them work as well as experience to ensure they are implemented effectively, all the way from national to local administration, extension services and farmers themselves.

This chapter provides a short overview of the existing policy measures in the Republic of Macedonia that directly or indirectly contribute to supporting HNV farmers. Then, it looks at a number of measures that could complement the already developed, but not yet approved, national agri-environmental programme in the Republic of Macedonia, the key policy measure used for supporting HNV farming in the EU.

5.1. Existing policy measures in the Republic of Macedonia

National budget support

The most important source of income for HNV farmers in the Republic of Macedonia remains the sale of their own produce, although some farmers also benefit from state support in the form of direct payments per head of farm animal.

The national budget introduced direct payments for cereals (per hectare) and for cattle (per head) in 2004. Since then, payments have also been introduced for milk and tobacco production. They are based on production and their budget is constantly increasing. Currently, direct payments are provided to all animals above a certain minimum number – 5 for cattle, 10 for goats and 30 for sheep. The support is digressive (not banded) and farms with up to 80 livestock units (LU) receive 100% of support, while farms with more than 300 LU receive 20%. In the Republic of Macedonia, some of the most commercial sheep farms are using mountain pastures for grazing, so these direct payments are contributing indirectly to maintaining the extensive sheep grazing system.

Market support is also provided via input subsidies and compensatory payments in cases of natural disasters. The share of input subsidies as a proportion of total support has decreased in recent years.

Support is also provided to organic farming, including for meadows and pasture in organic livestock production as well as sheep and goats produced organically. It was first introduced in 2005 when the interest in organic production was still very low and, despite the very low budget, there was very little uptake. As a result, no funding was provided in 2006. Increased interest led to the reintroduction of support in 2007 and since then it has increased each year. The budget for 2011 was 1.83 million EUR. Support for organic sheep and goat breeding consists of an additional 50% on top of conventional direct payments. It is also digressive (not banded) : 100% of the payment is paid to sheep flocks of up to 500 heads, with only 10% paid to flocks above 2,000 heads. In addition, if farmers sell their produce as organic, they receive another 2-5% of the received amount but not more than 2,500 Euro. Despite this, however, the area of organically certified pastures, meadows and wild plants was only 205 ha in 2009.

Rural development measures in the Republic of Macedonia were introduced as part of the National Strategy for Agriculture and Rural Development, adopted in 2007. This led to a significant increase in the overall agricultural budget in the Republic of Macedonia. However, the majority of the budget still goes to direct support payments. Rural development measures have been introduced that focus on increasing the competitiveness of agricultural holdings and improving human capacity through training and education. The measures offer payments for investments in agricultural holdings, processing and marketing of agricultural produce, improvement of infrastructure in rural areas and the creation of producer groups. The available budget for 2011 was 7.4 million EUR.

Support for shepherd's salaries is currently the only measure contributing to nature conservation in rural areas. It was introduced in 2009 and the budget for 2011 was 50,000 EUR. It is reported to have had limited uptake, however, mostly due to the low level of salary that is provided, compared to the social payments that shepherds usually receive in addition to their shepherding payments. Support to the local breed of Busha cattle, one of the breeds best adapted to the mountainous conditions of the Balkan region, was provided at 25 EUR/head in 2009, however the measure was not continued in 2010 and 2011.

EU pre-accession support

As a candidate country to the EU, the Republic of Macedonia is also eligible for financing from the Instrument for Pre-Accession Assistance in Rural Development (IPARD). The Macedonian Ministry of Agriculture, Forestry and Water Economy has developed an IPARD Programme, specifying the priorities and measures to be supported. The normal co-financing rate of the farmers for rural development measures is up to 50% of the investment

costs. If young farmers or farms in LFAs apply, the rate is increased to 55% and 60%. If both conditions are fulfilled the rate increases to 65%.

The following measures have been included in the IPARD Programme:

- *Priority 1: Improving market efficiency and implementation of Community standards*

Measure 101: Investments in agricultural holdings to restructure and to upgrade to Community standards,

Measure 103: Investments in processing and marketing agriculture products to restructure and to upgrade to Community standards

- *Priority 3: Development of rural economy*

Measure 302: Diversification and development of rural economic activities,

All measures focus on investments for the development of a range of sectors, including livestock breeding, and can contribute to the management of HNV farming systems. However, interest in these measures is still very low, mostly due to the strict requirements for land ownership documents. Farmers often cannot obtain property titles because the land use in cadastre maps does not correspond to actual land use and the procedures for changing land use status are reported to take a very long time.

The IPARD programme plans to pilot some of the agri-environment measures included in Macedonia's first National agri-environment programme (NAEP). NAEP measures are organised in six packages, each targeting specific aspects of the country's agri-environment issues:

- 1) Traditional agriculture will support traditional orchards (pears) and local breeds of sheep (Sharplaninska, Ovcepolca and Karakachan), cattle (Busha) and domestic buffalo. Support for the Balkan goat is not included.
- 2) Traditional pasture management will support pasture management (grazing) in the Bistra, Stogovo, Jakupica and Ilinsko-Plakjeska mountains, as well as the restoration and maintenance of mountain pastures through rotational grazing. The aim is to pilot whether the traditional management of grasslands can be supported in the absence of cadastre (parcel) borders for pastures. It is expected that the measure will contribute to the conservation and restoration of species rich high mountain grasslands and the maintenance of populations of threatened wild plant and animal species. This will contribute to finding a sustainable means of balancing conservation and the productive use of natural resources.

The pilot areas are selected to represent mountain pastures with contrasting uses. According to data in the Public enterprise for pasture management, active grazing of the pastures covers around 70% of the area in two of the pilot areas (Bistra and Sogovo mountains), around 50% in one pilot area (Jakupica), and the remaining pilot area is hardly grazed at all (Plakjeska planina). Participating farmers have to own at least 30 sheep and have to commit to grazing them in the mountains for between 90-130 days annually. The grazing density is defined according to the pasture's capacity and is between 3 and 4.7 heads of livestock/ha. The proposed payments are 30 EUR/head in addition to direct support.

- 3) Soil and water protection will support green cover in orchards and vineyards as well as integrated production and crop rotation.
- 4) Organic farming will support fodder and vegetable crops and medicinal and aromatic crops.

- 5) Landscape management will encourage the maintenance of open meadows and natural boundaries.
- 6) Agri-environment training is focused on vocational training and awareness raising.

The sub-measures to be piloted under IPARD measure 201 comprise: Preservation of local breeds in danger of extinction; Preservation of "Stanushina" grape variety; Organic production of vegetables and medicinal and aromatic crops; Green cover in orchards in the Resen region; and Crop rotation in the Pelagonija region (shown in *italics* in the table below). They are developed further with the support of project "Development and implementation of agri-environmental measures" (EuropeAid/ 129386/ IC/SER/ MK).

There will be no piloting of agri-environment schemes for the support of HNV grasslands.

Table 5.1. Measures currently included in Macedonian NAEP

Scheme	Sub-schemes	Sub - measures
Traditional Agriculture Scheme	Preservation of local breeds in danger of extinction	<i>Preservation of Sharplaninska sheep</i>
		<i>Preservation of Ovcepolca sheep</i>
		<i>Preservation of Karakachan sheep</i>
		<i>Preservation of Busha cattle</i>
		<i>Preservation of Domestic buffalo</i>
	Preservation of traditional crop varieties	Traditional pear varieties <i>Grape variety "Stanushina"</i>
Traditional Pasture Management	Pasture management	Bistra region
		Stogovo region
		Jakupica region
		Ilinsko-Plakjenska planina
	Restoration and maintenance of mountainous pastures through rotation of grazing	
Soil and Water Protection	Green cover in orchards	<i>Green cover in orchards (Pilot region Resen)</i>
	Green cover in vineyards	
	Integrated production	
	Crop rotation	<i>Crop rotation for vegetables in Pelagonija region</i>
Organic Farming		Organic farming of fodder crops
		<i>Organic farming of vegetable crops</i>
		<i>Organic farming of medicine and aromatic crops</i>
Landscape management	Maintenance of open fields through mowing	
	Maintenance of natural boundaries	
Agri-environmental Training	Vocational training	
	Awareness raising	

5.2. Recommendations for suitable agri-environment measures to be additionally included in NAEP

High Nature Value farming represents a sustainable use of agricultural land and the continuation of traditional farming systems. Some “natural values” associated with high levels of biodiversity or the presence of certain species and habitats depend largely on the nature of the agricultural activities in those areas.

The general conclusion of the local case studies, undertaken for this project, was that the main threat to HNV farming systems, in all case study areas, was linked to the under-use of pastures, reduced levels of agricultural activity and depopulation of rural areas. These factors had led to the degradation of natural

and traditional cultural systems that had played an important role in Macedonian rural areas in the past.

The aim of the proposed measures is to support agriculture with high nature value and to reintroduce traditional agricultural practices contributing to improved biodiversity and socio-economic conditions in rural areas in the Republic of Macedonia. Some of these measures do exist as a proposal in the current NAEP, but up to now they were not elaborated in detail and therefore not envisaged for implementation.

The proposed measures are presented in three main groups:

- Management of pastures
- Maintenance of landscape features, and
- Sustainable methods of farming.

I. Protection of traditional pastures with a high percentage of semi-natural vegetation (Management of pastures):

Sub-measure	Sustainable pasture management
Rationale	<p>The dominant characteristic of high nature value farming is low intensity management, with significant presence of semi-natural vegetation, particularly grasslands.</p> <p>Grass cover is traditionally maintained by grazing or mowing for hay and is a natural source of food for farmed animals, but at the same time home to many wild animal and plant species.</p> <p>Pastures in the Republic of Macedonia cover almost 541,000 hectares and are one of the most significant land covers, with economic as well as environmental importance. The results of the case studies show that the majority of pastures in Mariovo, Lakavica and Reka region are threatened by structural and ecosystem changes and succession, as a result of under grazing and abandonment. Reduced grazing in these three regions leads to the appearance of “undesirable” vegetation, such as: common juniper (<i>Juniperus communis</i>), wild pear (<i>Pyrus pyraster</i>), European Cornel (<i>Cornus mas</i>), red juniper (<i>Juniperus oxycedrus</i>), vetch (<i>Coronilla emoroides</i>), blackberry (<i>Rubus tomentosus</i>), wild plum (<i>Prunus cerasifera</i>), hawthorn (<i>Crataegus heldreichii</i>), hawthorn (<i>Crataegus monogyna</i>), rose (<i>Rosa canina</i>), hazel (<i>Corylus avellana</i>), and others. Such vegetation affects the landscape and biodiversity of the regions.</p> <p>The implementation of this sub-measure will allow management plans to be developed for the area and lead to the sustainable management of pastures. Indirectly, it will also contribute to preserving traditional and quality food products typical for each region (milk, cheese, kashkaval, wool and meat -lamb, pastrmka, etc.).</p>
Environmental objectives:	<p>General objectives of the measure:</p> <ul style="list-style-type: none"> • Conservation of high nature value farming systems • Supporting traditional extensive farming systems <p>Specific objectives of the measure:</p> <ul style="list-style-type: none"> • Use of pastures in a traditional way • Conserve the quality of grasslands ecosystems
Pilot scope	<p>It is proposed to implement the sub-measure in several pilot regions, including:</p> <ul style="list-style-type: none"> • Mariovo region • Region of Lacavica • Region of Reka
Specific eligibility requirements	<p>Beneficiaries:</p> <ul style="list-style-type: none"> • Should be registered on the MAFWE Farm Registry, • Animals should be tagged and recorded in the register of animals, • Farmers should have at least 5 heads of cattle, or 30 sheep or goats, • Have an agreement with the Pasture Management Enterprise for the use of public pastures, • Must participate in the annual and multiannual programme for Animal Health Protection and Public Veterinary Health.
Baseline standards	<p>Relevant mandatory standards (baseline standards) for agri-environment measures are the identified national rules addressing compulsory GAEC standards (related to soil erosion, soil organic matter, soil structure, minimum level of maintenance as well as protection and management of water) and minimum requirements for the use of fertiliser and plant protection products.</p>

Management requirements	<ul style="list-style-type: none"> • Farmers should keep and/or increase the area of pasture for at least 5 years, • Farmers should not use chemical substances for clearing pastures from weeds, tubers, plants, bush plants, • Farmers should not light fires on pastures and grasslands to clear them from weeds, tubers, plants, bush plants, • Farmers must adhere to the dates for grazing animals in keeping with the regionally established time periods: <ul style="list-style-type: none"> - Mariovo region- 250-260 days (summer/winter grazing) - Lakavica region -270-290 days (summer/winter grazing) - Reka region – 130-150 days (summer grazing) - Ratkova skala region: 210-230 days (extended summer grazing). • Farmers should participate in a training programme for at least 4 hours annually, • Farmers must develop an agri-environmental plan and keep farm records containing information on all agricultural activities performed on the farm that are relevant to the commitment.
Proposed payment rates¹	57 EUR/ha

Sub-measure	Rotational use of pastures
Rationale	<p>This sub-measure will contribute to improved maintenance and protection of natural and semi-natural pastures in the Republic of Macedonia.</p> <p>Sheep breeding in the Republic of Macedonia is traditionally carried out by individual and small family farms with herd sizes of 20 to 200 sheep, and occasionally up to 300. About 95% of milking sheep are raised in such farms. In 2009 the total number of sheep was 755,356. Sheep numbers have declined by 8% on individual farms, while sheep numbers in commercial agricultural enterprises increased by 2.5%. The main reasons for the decline of sheep breeding in the Republic of Macedonia are reported to be the unsettled social conditions of the rural population and the migration of people to urban areas.² The reduction in sheep numbers has led to the reduced use of pastures and resulting scrub encroachment with unwanted vegetation.</p> <p>This measure focuses on developing a grazing plan for the most threatened pastures in order to reduce and prevent encroachment with weeds, tubers, bush plants etc.</p>
Environmental objectives:	<p>General objectives of the measure:</p> <ul style="list-style-type: none"> • Maintaining traditional pastures • Supporting traditional extensive farming systems with HNV <p>Specific objectives of the measure:</p> <ul style="list-style-type: none"> • Use of pastureland in a traditional way • Conserve the quality of pastures
Pilot scope	<p>The sub-measure can be implemented horizontally over the whole territory of the Republic of Macedonia, or in regions defined by MAFWE / Public enterprise for pasture management,</p> <p>If priority regions are not identified, the sub-measure should be piloted in the following regions:</p> <ul style="list-style-type: none"> • Mariovo region • Region of Lacavica • Region of Reka
Specific eligibility requirements	<p>Beneficiaries:</p> <ul style="list-style-type: none"> • Should be registered in the MAFWE Farm Registry, • Animals should be tagged and recorded in the register of animals, • Should have at least 5 head of cattle, or 30 sheep or goats, • Should have an agreement with the State Enterprise for Pasture Management for using of public pastures, • The livestock breeder must participate in the annual and multiannual programme for Animal Health Protection and Public Veterinary Health.
Baseline standards	<p>Relevant mandatory standards (baseline standards) for Agri-environment measures are the identified national rules addressing compulsory GAEC standards (relating to soil erosion, soil organic matter, soil structure, minimum level of maintenance as well as protection and management of water) and minimum requirements for the use of fertiliser and plant protection products.</p>
Management requirements	<ul style="list-style-type: none"> • Farmers should develop a 5 years grazing plan, prepared in cooperation with the State Enterprise for Pasture Management , • Farmers should clearly indicate the parcels that are included in the pasture plan, • Farmers should perform at least 3 rotations of pastures in the 5 year commitment, taking into account the grazing capacity of the pasture, • Farmers should not use chemical substances for clearing pastures from weeds, tubers, plants, bush plants, • Farmers should not light fires on pastures and grasslands to clear them from weeds, tubers, plants, bush plants, • Farmers should participate in a training programme for at least 4 hours annually.
Proposed payment rates	114 EUR/ha

II. Maintenance of landscape features:

Sub-measure	Maintenance of natural field boundaries on agricultural land
Rationale	<p>This sub-measure will contribute to the maintenance and protection of landscape and biodiversity. Natural boundaries are an important habitat for birds, providing important cover, areas for nesting, a source of food, rest areas during migration. Therefore their protection is essential for field birds such as the grey partridge (<i>Perdix perdix</i>), quail (<i>Coturnix coturnix</i>), skylark (<i>Alauda arvensis</i>), crested lark (<i>Galerida cristata</i>), lark (<i>Melanocorypha calandra</i>), red-backed shrike (<i>Lanius collurio</i>), small shrike (<i>Lanius minor</i>), corn bunting (<i>Miliaria calandra</i>) in lowlands and hilly terrains, and woodlark (<i>Lullula arborea</i>) on the high hilly terrains and lower mountains.</p> <p>Natural boundaries and terraces are typical features in the landscape and can be observed throughout the Republic of Macedonia. However they are not maintained and are often destroyed to enlarge fields or during land consolidation</p> <p>LPIS definition for natural field boundaries (hedges) is used for the purpose of this sub-measure. They are defined as strips of ligneous plants, such as trees and bushes, in the largely open cultural landscape, up to 10 meters wide, of diverse botanical composition and important habitat and buffer space for animals and plants. They occurs mainly along the boundaries of agricultural parcels, rivers, roads, tracks and drainage channels.</p> <p>Terraces are also an important feature of the landscape in the country and therefore it is proposed that they are included within the scope of this sub-measure.</p>
Environmental objectives:	<p>General objectives of the measure:</p> <ul style="list-style-type: none"> • Maintenance of natural? landscape features <p>Specific objectives of the measure:</p> <ul style="list-style-type: none"> • Protection of natural and semi-natural habitats • Maintenance of natural boundaries • Maintain the natural landscape characteristics of the region • Conservation of biodiversity
Pilot scope	It is proposed that this sub-measure is implemented in the Lakavica pilot region.
Specific eligibility requirements	<p>Beneficiaries:</p> <ul style="list-style-type: none"> • Farmers must own agricultural land in the region of Lakavica, • The farm area must have natural and semi-natural boundaries (field boundaries, terraces, hedges, etc.), defined as habitats for animal and plant species by the MoEPP.
Baseline standards	Relevant mandatory standards (baseline standards) for agri-environment measures are the identified national rules addressing compulsory GAEC standards (relating to soil erosion, soil organic matter, soil structure, minimum level of maintenance as well as protection and management of water) and minimum requirements for the use of fertiliser and plant protection products.
Management requirements	<ul style="list-style-type: none"> • Farmers should develop a plan for maintaining the natural habitats on their farming plots in cooperation with competent persons from MoEPP, • Farmers must leave an uncultivated areas of 1 metre width around the boundaries of their parcels , • Farmers should not use chemicals on uncultivated areas, • Farmers should not mow the uncultivated area in the period March to June, • Farmers should retain stone walls or terraces on his agricultural land where they exist, • Farmers should participate in a training programme for at least 4 hours annually, • Farmers should keep farm records containing information on all the agricultural activities performed on the farm relevant to the commitment.
Proposed payment rates	67 EUR/ha



III. Sustainable methods of farming

Sub-measure	Sustainable methods of farming
Rationale	<p>This sub-measure will contribute to improved maintenance and protection of soil and water through the rational use of natural resources and the use of sustainable agricultural practices in the Republic of Macedonia.</p> <p>There are limited data to measure the environmental impacts associated with agriculture in Republic of Macedonia. Although the main source of pollution of soil and water in the country emanates from discharged and untreated municipal and industrial wastewater, in areas with a significant number of farms significant diffuse pollution of soil and surface waters from nitrates and phosphates is observed, due to the uncontrolled use of mineral fertilisers and manure. According to recent data, use of mineral fertilizers is low (approximately 104 kg NPK per hectare of arable land or 12kg NPK per hectare of agricultural land, although there are no data on the use of fertilisers at the farm level.</p> <p>The most serious source of pollution of surface waters are pesticides, nitrogen compounds, phosphates, various organic materials with high oxygen consumption and pathogenic organisms (as a result of poorly stored and handled pesticides, manure, liquid manure, sewage, waste water from silos and other waste from farms). Such waste is present in areas with intensive agriculture. With the continuing trends of intensification and modernisation of agriculture, pollution is expected to increase.</p> <p>Therefore this sub-measure aims to introduce agricultural practices that exceed standards of good agricultural practice and introduce sustainable management practices that will contribute to the general protection of soil and water from excessive pollution from agricultural activities.</p>
Environmental objectives:	<p>General objectives of the measure:</p> <ul style="list-style-type: none"> • Soil and water protection against pollution from agricultural sources. <p>Specific objectives of the measure:</p> <ul style="list-style-type: none"> • Reduced use of pesticides and fertilisers, • Reduced water and soil pollution as a result of the reduced and controlled introduction of fertilisers and pesticides, • Increasing the content of organic matter in the soil
Pilot scope	The sub-measure can be carried horizontally on the whole territory of the Republic of Macedonia or in regions defined by the MAFWE
Specific eligibility requirements	<p>Beneficiaries:</p> <ul style="list-style-type: none"> • Farmers must have land that is registered as an agricultural business in the Republic of Macedonia and must own a minimum of 0.3 ha of agricultural land/arable land
Baseline standards	Relevant mandatory standards (baseline standards) for agri-environment measures are the identified national rules addressing compulsory GAEC standards (relating to soil erosion, soil organic matter, soil structure, minimum level of maintenance as well as protection and management of water) and minimum requirements for the use of fertiliser and plant protection products.
Management requirements	<ul style="list-style-type: none"> • Farmers shall carry out once every 2 years, • Farmers must prepare and implement an annual nutrient management plan based on the results of soil analysis, • Farmers may not spread sewage sludge on their land, • Farmers should participate in a training programme for at least 4 hours annually, • Farmer must develop an agri-environment plan and keep farm records containing information on all the agricultural activities performed on the farm relevant to the commitment,
Proposed payment rates	78 EUR/ha



Sub-measure	Buffer zones along water bodies
Rationale	<p>This sub-measure will contribute to improved maintenance and protection of soil and water through the rational use of natural resources and use of sustainable agricultural practices.</p> <p>This sub-measure will contribute to improved maintenance and protection of soil and water through the rational use of natural resources and the use of sustainable agricultural practices in the Republic of Macedonia.</p> <p>There are limited data to measure the environmental impacts associated with agriculture in Republic of Macedonia. Although the main source of pollution of soil and water in the country emanates from discharged and untreated municipal and industrial wastewater, in areas with a significant number of farms significant diffuse pollution of soil and surface waters from nitrates and phosphates is observed, due to the uncontrolled use of mineral fertilisers and manure. According to recent data, use of mineral fertilizers is low (approximately 104 kg NPK per hectare of arable land or 12kg NPK per hectare of agricultural land, although there are no data on the use of fertilisers at the farm level.</p> <p>The most serious source of pollution of surface waters are pesticides, nitrogen compounds, phosphates, various organic materials with high oxygen consumption and pathogenic organisms (as a result of poorly stored and handled pesticides, manure, liquid manure, sewage, waste water from silos and other waste from farms). Such waste is present in areas with intensive agriculture. With the continuing trends of intensification and modernisation of agriculture, pollution is expected to increase.</p> <p>Therefore this sub-measure aims to introduce agricultural practices that exceed standards of good agricultural practice and introduce sustainable management practices that will contribute to the general protection of soil and water from excessive pollution from agricultural activities.</p>
Environmental objectives	<p>General objectives of the measure:</p> <ul style="list-style-type: none"> • Protection of soil and water from pollution from agricultural sources. <p>Specific objectives of the measure:</p> <ul style="list-style-type: none"> • Reduce use of pesticides and fertilisers, • Reduce water pollution and soil as a result of reduced and controlled introduction of fertilisers and pesticides • Increase the content of organic matter in the soil and improve its chemical properties.
Pilot scope	The sub-measure can be carried out horizontally over the whole territory of the Republic of Macedonia or in regions defined by the MAFWE
Specific eligibility requirements	<p>Beneficiaries:</p> <ul style="list-style-type: none"> • Farmers must all be registered agricultural businesses in the Republic of Macedonia that own a minimum of 0.3 ha of agricultural land/arable land
Baseline standards	Relevant mandatory standards (baseline standards) for agri-environment measures are the identified national rules addressing compulsory GAEC standards (relating to soil erosion, soil organic matter, soil structure, minimum level of maintenance as well as protection and management of water) and minimum requirements for the use of fertiliser and plant protection products.
Management requirements	<ul style="list-style-type: none"> • Farmers must create and maintain green cover of 5m width along all water bodies, • The use of mineral fertilisers is prohibited on the 5 m buffer zones along water bodies, • The use of sewage sludge is prohibited on the 5m buffer zones along the water bodies, • The use of plant protection products is prohibited on the buffer zones, • Farmer shall mow the green cover in the buffer zones at least once per year, • Farmer should participate in a training programme for at least 4 hours annually, • Farmer should develop an agri-environment plan and keep farm records containing information on all the agricultural activities performed on the farm relevant to the commitment,
Proposed payment rates	38 EUR/ 100 m

Footnotes

¹ Detailed payment calculations can be obtained by the project team. The calculations were done on the basis of the income forgone and additional cost incurred by the implementation of the proposed AE sub-measure.

² Annual report of the Ministry of Agriculture and Water Economy, 2009, MAFWE 2010

6. Chapter

Partnering for Farmland Biodiversity Conservation: Civil Society and Farmers Working Hand-In-Hand

Darko Znaor

Agriculture has been Macedonia's backbone for centuries and has always played an important role in Macedonian society. By maintaining landscape and biodiversity through the ages, Macedonian farmers have been the true guardians of an important national treasure – biodiversity. They have been the invisible hand managing landscapes, agricultural habitats and enabling farm-linked biodiversity to provide a range of ecosystem services. Pollination; pest, disease, flood and fire regulation; preservation of genetic resources; and the provision of food, fibre, natural medicine, pharmaceuticals and appealing landscapes are only a few of these services.

Agricultural biodiversity under threat

Many of the Macedonian landscapes and habitats that are important for conservation have been created by centuries-old practices of extensive grazing and low-input small-scale cropping practices. There is a very strong inter-linkage between farming, biodiversity and maintenance of traditional agricultural landscapes. However, depopulation of farming communities and their ageing, together with the introduction of agricultural machinery and intensive animal husbandry in fertile plains has drastically decreased the number of livestock in marginal areas. Most of these are mountainous regions with poor soils, but with species-rich grassland and other valuable ecosystems. Macedonian agriculture has also become "less mobile". Traditional pastoral grazing systems, flocks and shepherds are nowadays more a tourist attraction than a common sight.

A reduction of livestock density results in less moving and grazing, leading to land abandonment and changes in land use. The area of farmland of high natural value and the mosaic of habitats for wildlife in the Republic of Macedonia has been shrinking due to an invasion by shrubs and other pioneering vegetation. This process results in the growth

of coarse vegetation, leads to the development of semi-woody species and eventually closed canopy forests. Such ecosystems have substantially lower biodiversity value than fragmented agricultural landscapes, notably natural grassland. They harbour less bird, butterfly and plant species than managed grassland. Enhanced natural succession also causes a higher risk of fire because the excess biomass is not subject to grazing pressure. If not adequately addressed, the problem of land abandonment and natural succession in the Republic of Macedonia will cause irreversible damage.

The expansion of intensive agriculture in the lowlands is another threat to agricultural biodiversity. Land drainage, removal of hedges and other field margins, usage of pesticides and fertilisers are leading to a decline in agricultural biodiversity and provision of related ecosystem services.

Agri-environment programmes promise vs. farmers' reality

The EU has introduced agri-environment programmes and payments to stop and to reverse these kinds of negative trends. In the accession process, the Republic of Macedonia is required to design its own agri-environment programmes, compatible with the Common Agricultural Policy. These programmes encourage farmers to continue practising environmentally friendly measures or introduce those that are not economically attractive, but essential from the environmental and

biodiversity point of view. Agri-environment payments are an instrument through which society rewards farmers for the public goods and services they provide, as the market does not recognise their values. However, Macedonian farmers have to be aware of this opportunity and to be prepared for benefiting from agri-environment programmes.

For various historical, socio-economic, administrative, and other reasons, in the Republic of Macedonia – as in some other countries – the human and social capital for administering and implementing agri-environment programmes is limited. The uptake in these programmes in the Republic of Macedonia is likely to be slow and on a limited scale due to the following obstacles:

1. Farming in the Republic of Macedonia, notably in high-nature-value areas is practiced predominantly by small-scale, (semi)-subsistence, elderly and poorly educated farmers. They have limited entrepreneurial skills, financial power and technical know-how. Besides, many operate in the most marginal areas (from an agriculturalist perspective) and under difficult weather conditions and socio-economic realities.
2. The majority of such farmers are outside of the mainstream economic and administrative systems. They produce mostly for themselves and their extended families, selling their surplus products locally for cash, without any receipts or VAT charged. They are not obliged to practice bookkeeping and are not subject to income tax. The farmland they use, especially grasslands – as well as their livestock is rarely included in the Land and other Registers. These farmers are the “outlaws” of the official systems and as such are not eligible for EU area-based support schemes such as agri-environment payments. Those few such farmers who would like to become a part of the official systems and register their land and livestock, face complicated, unresolved land ownership and land use issues – sometimes going back several generations.
3. Products (cheese, milk, “kashkaval”, salami, etc.) that are produced in a traditional way do not necessarily meet the respective national or newly harmonised EU sanitary, veterinary or hygiene standards, making their sale through mainstream marketing channels virtually impossible.
4. Agri-environment payments compensate for additional costs and/or income foregone associated with the implementation of the respective measures. But they do not fully take into account negative agricultural externalities and reward farmers for positive externalities by providing them an additional incentive – an extra, above the costs occurred and/or income foregone.
5. Very few Macedonian farmers have agricultural or education in nature conservation. A vast majority relies only on practical experience and tradition; and they are not sufficiently aware of the ecosystem services they provide and their value for society as a whole. For most of them farming is not their deliberate choice but an inevitable job – a survival strategy. Many of them are likely to perceive agri-environment as an externally imposed concept that has little to do with their harsh reality and their priorities.

Environmental NGOs can help to remove barriers preventing a better uptake of agri-environment programmes

The above-mentioned issues are serious obstacles for the enrolment in agri-environment programmes. However, examples from EU Member States facing similar problems, notably Romania, Bulgaria and some Mediterranean countries show that barriers preventing uptake in agri-environment schemes can be removed if a creative approach is applied and social consensus reached. Building farmers’ capacities by providing them various forms of technical and administrative assistance and by setting up an appropriate legislative framework, social/institutional structures and facilities can increase farmers’ participation in agri-environment programmes. The feasibility of establishing various forms and institutional



settings for collective agri-environment schemes can be explored. In this case a group of small-scale farmers can jointly apply for agri-environment payments (e.g. by setting up a co-operative or through the help of the municipality, etc). Taking part in a collective agri-environment scheme would not only relieve individual farmers from administrative burdens. It is also likely to be more effective and more profitable. Moreover, in many cases, this might be the only way for small-scale farmers to benefit from agri-environment payments.

Environmental NGOs can play a vital role in assisting both farmers and society to understand high-nature value farming and agri-environment programmes. Their members are often well educated, enthusiastic young experts who will potentially over time evolve into opinion leaders and/or decision makers. Environmental NGOs can act as catalysts between farmers, policy makers and society. By increasing understanding, informing and educating various stakeholders they can reinforce farmers' position and create a win-win situation for all social groups. Environmental NGOs can work on informing both farmers and citizens why it is important to protect biodiversity and how this can benefit them. Protection of biodiversity can only succeed if all stakeholders actively understand and support the conservation vision and objectives set by agri-environment programmes. Policy makers should create an enabling environment for this to happen and NGOs can significantly influence them. However, as policy makers often tend to neglect the needs of small farmers – at the expense of “big producers” – environmental NGOs can act as their guardians and make policy makers and civil society more aware about the “hidden” values they provide. Society often tends to develop an attitude of underestimation towards people living in marginal rural areas. Many people – not only in the Republic of Macedonia – still think that only “losers” choose to live in these areas, i.e. only those who are not “good” or “competent” enough to find their place elsewhere. The attitude that farming is an occupation chosen by those who are not capable or who are not able to do anything else still prevails today. However, those

who have that kind of attitude tend to forget that their economic prosperity and welfare is also due to the hard work of those living in remote rural areas and providing the ecosystem services mentioned in the beginning of this Chapter. Environmental NGOs can lobby to put these kinds of issues higher on the political agenda. Through information dissemination, awareness raising, education, demonstration projects, campaigns, etc., they can enlighten citizens and policy makers about the importance of (agricultural) biodiversity and the ecosystem services provided by marginalised farmers. Besides, NGOs can also serve as watchdogs securing that legislation aiming at protecting agricultural biodiversity is put in place and enforced. Further, NGOs can build networks, coalitions and alliances of like-minded individuals and organizations. They can establish a forum of different yet commonly concerned actors and initiate dialogues across differing perspectives and players.

The strengthening of social and human capital in order to ensure a smooth and large-scale uptake of agri-environment measures in the Republic of Macedonia is a long-term and complex process. It requires understanding and co-operation between relevant stakeholders, a constant exchange of information and capacity building. (Small-scale) Macedonian farmers can continue providing the ecosystem services that are so vital to society only if society is willing to reward them for their hard and honest work. Environmental NGOs are there to help and facilitate that process. This very project has paved the road to a long-lasting partnership between Macedonian farmers, environmental NGOs and policy makers.



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