Developing a National Agri-environment Programme for Turkey

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Foreword

With each passing day the world population and the demand for food is increasing, but the land available for agriculture is decreasing and 850 million people are currently living on the threshold of hunger.

The agricultural sector holds an important place in our country for the nutrition of our people, for employment, for its input to the economy and for its export potential. Whilst we are obliged to supply the necessary levels of production, we are also obliged to ensure sustainability. However, it is not possible to make progress with sustainability without considering the relationship between agriculture and environment.

Therefore, we need to apply an agricultural strategy which considers also the agricultural land, water catchments and the ecological balances.

It is of a crucial importance to implement agricultural techniques as they are required, but to also make more rational use of agricultural inputs and to extend organic farming and nature friendly farming practices

In order to be able to establish a philosophy of sustainable agriculture which will allow future generations to meet their own needs, our Agriculture Act No. 5488 is already supporting farmers in many areas with activities like the Environmentally-based Agricultural Land Protection (ÇATAK) Programme and Good Agricultural Practices.

For that purpose, I thank everyone that contributed to the preparation of this handbook which aims to decrease the negative impact of agriculture by supporting the conservation of soil and water quality, the sustainable use of renewable natural resources and the prevention of erosion. I hope this handbook will be beneficial to all governmental and non-governmental institutions.

Dr. Mehmet Mehdi EKER
Minister of Agriculture and Rural Affairs

About this Handbook

This Handbook presents many of the key outputs, recommendations and accumulated expertise from a project entitled "Supporting the Development of a National Agri-environment Programme for Turkey" that was undertaken from January 2006 – November 2008.

It is produced in both Turkish and English and is intended as reference document to support the future programming of agri-environment measures in Turkey, with particular reference to the opportunities and obligations associated with EU co-financing. Special attention is also given to introducing the concept of High Nature Value (HNV) farming and the biodiversity benefits associated with using agri-environment (and other rural development) measures to maintain certain types of low intensity farming systems typically found in Turkey.

The Handbook contains 7 main sections:

- Introduction – an overview of the project;
- Agriculture and the Environment in Turkey – including a detailed situation analysis of the main changes in Turkish agriculture since the 1950s; the impact of Turkish agriculture upon the environment, and; existing policy responses to the environmental impact of Turkish agriculture;
- High Nature Value (HNV) Farming in the European Union – including the definition of HNV farming types and why HNV farming is a priority for the European Union;
- High Nature Value (HNV) Farming in Turkey – this section presents the first systematic application of the HNV farming concept to Turkey, including the development of a typology of HNV farming systems and a map of the potential distribution of HNV farmland;
- Agri-environment Policy-making in Europe – an overview of the principles and practice of agri-environment policy-making as currently applied in the European Union;
- Developing a National Agri-environment Programme for Turkey – including detailed recommendations on the development and enhancement of a single framework for the programming and implementation of agri-environment policies in Turkey;
- Implementation of Agri-environment Schemes – an overview of some of the key issues relating to the practical implementation of agri-environment schemes, with particular reference to the obligations associated with EU co-financing.

Section 1

Introduction

1.1 The Project

Agri-environment payments are an obligatory measure for European Union (EU) Member States to implement under Pillar II of the Common Agricultural Policy (CAP) and are therefore an important part of the legislation for rural development that countries preparing to join the EU must adopt.

Turkey has already made significant progress with the development of various agri-environment initiatives, including a mixture of regulations and incentives for encouraging more sustainable management of natural resources by farmers. The objective of this project was to support policy makers and other key actors/stakeholders to develop proposals for a National Agri-environment Programme (NAEP) that effectively integrates existing agri-environment initiatives in Turkey with relevant EU legislation. An important priority for the project was to stimulate and support the agri-environment policy development process (with a particular emphasis upon biodiversity conservation) that it will be necessary for the Turkish government to undertake in preparation for EU accession.

The specific objectives of the project were to:

a. introduce the concept of "High Nature Value" (HNV) agricultural land to relevant governmental and non-governmental organisations in Turkey;
b. introduce the concept of EU co-financed agri-support payments to the same governmental and non-governmental organizations;
c. bring together policy-makers and relevant stakeholders to develop an effective model of the organisational structure necessary for developing future agri-environment policy in Turkey;
d. use this model of the necessary organisational structure to prepare pilot agri-environment schemes for two contrasting pilot areas in Turkey;
e. apply the results and lessons learnt from this process to the development of proposals for a National Agri-environment Programme (NAEP) for Turkey;
f. widely disseminate and promote the results of this work to all relevant governmental and non-governmental organizations thereby building a "body of informed opinion" about agri-environment issues amongst policy- and decision-makers, together with all other key actors/stakeholders in Turkey.

1.2 Project Partners

Avalon is a not-for-profit organization in the Netherlands that was established in 1991 to stimulate the development of sustainable rural development in central and eastern Europe (CEE). During the early years of its establishment, Avalon focused specifically upon introducing the concept of organic farming. From 1996 it began to diversify its activities and from 1997– 2001 a consortium led by Avalon (together with several CEE and EU-partners) implemented a programme of projects funded by the Dutch government and entitled "*Agri-Environmental Programmes in Central and Eastern Europe*". These projects were undertaken in the 10 CEE Accession Countries preparing to join the European Union in response to the urgent need at the time to introduce, promote and develop the concept of agri-environment payments.

The 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 active national Agri-environment Working Groups that continued to elaborate pilot agri-environment projects for pre-accession funding and full national agri-environment programmes for EU co-financing after accession. This approach was further successfully replicated during 2002 - 2004 in Croatia.

The Institute for European Environmental Policy (IEEP) is an independent policy studies institute established in 1982 with particular expertise on matters relating to agriculture, the environment and rural development policy in EU Member States and Accession Countries. In addition to working regularly for the European Commission and the European Environment Agency, IEEP undertakes studies for a number 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 High Nature Value (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.

Buğday (Association for Supporting Ecological Life) is a non-governmental organisation founded in Turkey in 1990 to promote greater awareness, understanding and sensitivity to "ecological living" by individuals and society as whole. Buğday works on a wide range of issues relating to ecological living, including:

- support for the expansion of organic agriculture, especially the development of a healthy domestic market;
- the maintenance of traditional farming methods, such as the use of local seed varieties;
- encouraging sustainable communities that live in harmony with nature;
- developing eco-agro tourism.

Buğday's current activities include co-ordinating the first 100% Ecological Market Places in Turkey (3 markets opened in Istanbul, Antalya and Samsun); the Eco-Agro Tourism and Voluntary Exchange Project (TATUTA); managing the "Ecological Agriculture Communication Network" between Ministries, farmers, businesses consumers and the media; a pilot Community Supported Agriculture project in Istanbul with 100 members,

and; numerous publications including the *Buğday Ecological Living Magazine*.

1.3 The Agri-environment Working Group

A key focus of the project was establishing and building the capacity of an Agri-environment Working Group. The Working Group was first established in June 2006 and became the back-bone and main "think-tank" of the project. Membership of the Working Group was initially small, but diverse. It included people with various fields of expertise in agriculture and the environment who represented a variety of governmental and non-governmental stakeholder organizations.

With the guidance and support of the local partner, Buğday, an effective working relationship was quickly established and maintained between the project team and the members of the Working Group. The Group met frequently with a total of 7 full Working Group meetings and 4 Sub-working Group meetings held between

June 2006 and June 2008. All of the meetings were well attended with enthusiastic participation by the Working Group members. Discussions were intensive, but the meetings provided an important platform for the exchange of ideas and experiences about the concept and agri-environment payments and its relevance and applicability to Turkey.

The development of the Working Group was carefully planned and managed. A dynamic "learning environment" was created for the Working Group with the objective of developing skills in agri-environment policy development. This included the completion of two theoretical studies that resulted in the formulation of pilot agri-environment schemes for two contrasting areas in Central Anatolia and the Black Sea region.

This process of "shared learning" by people from a range of different disciplines/professional backgrounds was very effective and functioned as a simple model of the real development processes associated with agri-environment policy-making in the future.

It was therefore very encouraging to observe the growth in the Working Group throughout the duration of the project, both in terms of the number of participating members and in the extent of cross-sectoral representation, including environmental and agricultural, governmental and non-governmental, academic and non-academic. This included a total of 93 participants

representing 36 different organisations (see Table 1.1) - including:

- 14 Directorates and/or Departments from the Ministry of Agriculture and Rural Affairs (MoARA);
- 10 Directorates and/or Departments from the Ministry of Environment and Forestry (MoEF);
- one Department from the Ministry of Culture and Tourism (MoCT);
- 3 Divisions from the State Water Works Authority (DSI);
- 6 NGOs, and;
- 3 Departments from two Universities;

Indeed, the Working Group was widely acknowledged as completely unique in the Turkish context for bringing such a diverse (and at times potentially conflicting) group of interests together.

Table 1.1: List of Stakeholder Organisations Participating in the Agri-environment Working Group

Governmental Organisations

Ministry of Agriculture and Rural Affairs (MoARA) – with representation from the following General Directorates and Departments:

General Directorate of Agricultural Production and Development (TÜGEM) – including:

- Department of Alternative Agricultural Production Techniques Department (ATÜT)
- Department of Good Agricultural Practices
- Department of Vegetative Production Department (BÜDB)
- Department of Environmentally Based Agricultural Land Protection (ÇATAK) Programme
- Department of Agricultural Land Evaluation
- Department of Grasslands, Pasture and Fodder Production
- Strategy Development Department

General Directorate of Protection and Control (KKGM)

General Directorate of Agrarian Reform

Department of Legal Affairs (serving all MoARA Directorates)

Samsun Provincial Directorate of MoARA

Ministry of Environment and Forestry (MoEF) – with representation from the following General Directorates and Departments:

General Directorate of Environment Management – including:

- Water and Soil Management Department
- Sea and Coastal Management Department

General Directorate of Nature Conservation and National Parks – including:

- National Parks Department
- Nature Conservation Department
- Sensitive Ecosystems Department
- Biodiversity and Genetic Resources Department
- Protected Species Department
- Wetlands Department

Environmental Protection Agency For Special Areas (ÖÇKK)

State Hydraulic Works (DSI) – with representation from the following Divisions of the Study and Planning General Directorate:

- Agricultural Economy Division
- Soil and Drainage Division
- Environment Division

Non-Governmental Organisations

- Nature Society (Doğa Derneği)
- TEMA – The Turkish Foundation for Combating Soil Erosion, Reforestation and the Protection of Natura Habitats
- WWF Turkey
- Doğa Koruma Merkezi
- Kuş Araştırmaları Derneği (KAD)
- Association for Sustainable Rural and Urban Development (SÜRKAL)

Universities

- Faculty of Agricultural Economics, Ankara University
- Zootechnics Department, Faculty of Veterinary Science, Ankara University
- Agricultural Economics Department, 19 May University, Samsun

Section 2

Agriculture and Environment in Turkey

2.1 Introduction

Effective agri-environment policy-making for Turkey should begin with a clear understanding of the relationship that exists between agriculture and the rural environment. This includes the relationship with:

- soil and water resources;
- biodiversity and wildlife habitats, and;
- the genetic diversity of agricultural crops and animals.

This understanding is essential for underpinning future policy support for the promotion of more environmentally-friendly and sustainable agriculture, including:

- justifying the development of specific agri-environment activities, and;
- developing criteria for the selection of measures and areas to include in pilot projects and other capacity-building activities.

However, the relationship between agriculture and the environment can be complex, including both positive and negative impacts upon the natural environment. For example, traditional agricultural practices such as extensive grazing often have a positive impact upon the environment, including the creation of valuable semi-natural habitats such as pastures that are rich with many different plant species. On the other hand, the more modern farming practices associated with the expansion, specialisation and intensification of agricultural production commonly have many negative impacts, including the loss of biodiversity, soil degradation and increased pollution of ground and surface waters.It is therefore important to prepare an analysis of the current situation using a clearly defined framework that presents relevant data and information in a factual and concise form. One approach that is commonly used for investigating the connections between agriculture and the environment (e.g. EEA, 1999) is the 'Driving Force-Pressure-State-Impact-Response' (DPSIR) framework first developed by the OECD. The DPSIR analytical framework describes the relationship between agriculture and the environment as a 'loop' (Figure 2.1) within which:

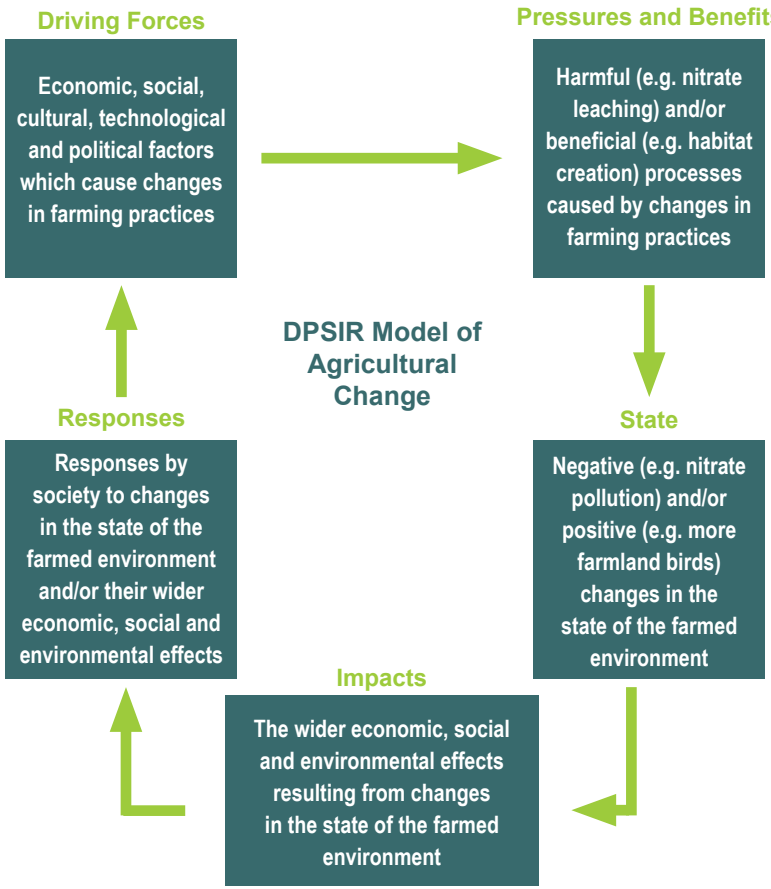
- a range of **DRIVING FORCES** (including economic, social, cultural, technological and political factors) influence the development of agriculture and cause changes in farming practice;
- changes in farming practice lead to

PRESSURES (harmful processes) and **BENEFITS** (beneficial processes) which influence the STATE or condition of the farmed environment which in turn may have a wider economic, social or environmental effect or **IMPACT**;

- these wider effects provoke society to adopt a range of **RESPONSES** by policy-makers and others in order to modify, or in some cases maintain, the driving forces originally influencing the farming practices.

An example of using the DPSIR framework to prepare an "agri-environmental situation analysis" for Turkey is included in this section of the

Figure 2.1: The 'Driving Force-Pressure-State-Impact-Response' (DPSIR) analytical framework for assessing changes in agricultural practices (adapted from various sources)



Handbook. It contains the following components:

- a simple overview of the Turkish agri-environmental context, including basic profiles of environmental resources and agricultural production systems;
- the main changes in Turkish agriculture since the 1950s and some of the driving forces that have caused these changes;
- the main impacts of these changes in Turkish agriculture upon the environment, including soil and water, biodiversity and genetic resources;
- existing responses by Turkish policy-makers and others to the environmental impacts of agriculture upon the environment, and;
- identification of the need for further policy responses to address the specific environmental issues (positive and negative) associated with agriculture in Turkey.

2.2 Basic Environmental Profile

Turkey has a total area of 778,997 km^2 and is a high altitude country with an average height above sea-level of 1,132 metres. The European part (Thrace) is a fertile hilly land and the Asian part (Anatolia) consists of an inner plateau with mountain ranges along the north and south coasts. This plateau rises from sea level in West Anatolia to an altitude of 800 – 1000 metres in Central Anatolia and then to over 1,700 metres in East Anatolia. The highest mountain of the country, Ağri (5,172 metres), is in East Anatolia.

The classification and distribution

Figure 2.2: Map of Turkey and surrounding region

of land according to its altitude is as follows:

Plains (0-250 metres)	10%
Hills (250-800 metres)	23.3%
Mountains (>800 metres)	66.7%

(50% of Turkey is over 1000 metres high)

Soils are generally poor and their productivity is limited by depth, plus altitude, low rainfall and steep slope. Only 15.2% of soils are deeper than 90 cm and the majority (72.1%) are shallow (20-50 cm) or very shallow (0-20 cm). Large areas of the land surface are also very rocky.

Turkey has a semi-arid climate, but the diverse topography, and particularly the existence of mountains parallel to the coasts, results in great differences in climatic conditions from region to region.

The southern coastal areas of the Aegean and Mediterranean regions enjoy a Mediterranean climate with hot, dry summers and mild, rainy winters. In contrast, the Black Sea climate of the northern coastal areas is much wetter and cooler throughout the year, whilst the high plateau of Central Anatolia has a steppe climate with relatively little annual precipitation and much greater differences in temperature between the cold winters and hot summers. In Eastern Anatolia the differences between seasons are even more extreme with long, very cold snowy winters following the hot dry summer months.

Average precipitation is 646 mm per year, but there are huge variations between regions from almost 2,500 mm in the high mountains of the eastern Black Sea region to 250-300 mm in some parts of central Anatolia.

Turkey has 25 river basin catchments areas (watersheds) with major river systems discharging into all of the coastal waters surrounding Turkey – plus the Euphrates River which flows into Syria and the Aras River which flows into Armenia. The longest river is the Kızılırmak (1,355 km) which flows into the Black Sea.

Turkey is located in a unique geographical position at the junction of three continents, Asia, Europe and Africa. This “cross-roads” location, combined with the diverse geomorphology and climatic conditions, means that Turkey is a key country for global biodiversity conservation with species originating from the north (Europe), the east (Western Asia) and the south (Africa). For example, with nearly 9,000 species of vascular plants and ferns Turkey has the richest flora of any country in the temperate zone and a level of endemism of almost 34% (3,022 species). Some of these endemic species are localised in specific mountain ranges. Others are more widespread, especially in the eastern part of the country. Turkey’s natural habitats vary greatly and new plant species are still being discovered at a rate of more than one a week (Doğa Derneği, 2008).

Grasslands and steppe habitats have a very high biodiversity, however relatively little is known about the actual

abundance of species since only a few surveys and inventories have been undertaken. Furthermore, these habitat types are not under the protection of any specific governmental authority.

Wetlands occupy 2% of the total land area (1,300 000 ha) and are mainly (70%) shallow lakes less than 6 metres deep. These are important areas for over-wintering, migrating and breeding birds, as well as various species of fish, amphibians and reptiles. 365 bird species are regularly seen from 468 bird species recorded in Turkey (MoEF, National Nature Conservation Report 2008). A total of 255 wetlands are defined as Important Bird Areas (KBAs, 2006), 135 wetlands are considered of International Importance and 12 wetlands are designated as Ramsar sites under the RAMSAR convention (MoEF, 2008, RAMSAR, 2008).

A range of other protected areas have also been designated and their number was increased in 2001 to cover 5.8% of the total area of Turkey. This includes 39 National Parks, 29 Nature Parks, 32 Nature Reserve Areas, 105 Natural Monuments and 14 Special Protected Areas (MoEF, National Nature Conversation Report 2008) among others.

Turkey also has biodiversity commitments under various international agreements, including:

- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) (1994);
- Ramsar Convention on Wetlands;
- Convention on Biological Diversity (CBD) (1996);
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES Convention) (1996).

Despite these measures and commitments, the abundance of species is still decreasing because of the deterioration of their habitats due to the rapid expansion of tourism, urbanisation, improvement of land for agriculture and major investments projects such as dam construction for irrigation and hydroelectricity.

Available data on biodiversity are incomplete and inconsistent (KBAs, 2006), but it is estimated that there are currently:

- 22 mammals, 13 birds (90 nationally threathened) , 10 amphibian, 9 reptiles, 12 freshwater fish and 50 fish species under threat of extinction according the Global Red List and;
- 1633 endangered plant species of which 848 are endemic,

A major problem is that available inventories only cover small areas and a few species, consequently it is difficult to fully assess the impact of the increasing human population and economic development upon habitats and wildlife species. However, three main ecosystems are consistently mentioned by experts as requiring attention and further protection – wetlands, coastal zones and steppelands (Klok and Koopmanschap, 2008).

The first study regarding Turkey's Important Bird Areas (IBAs) was

published in 1989 by Doğal Hayatı Koruma Derneği (DHKD) and BirdLife International. This was revised in 1997 by DHKD and then again in 2004 by Doğa Derneği (DD) to include a total of 184 sites. In 2002, InsectLife International published an inventory of Turkey's Prime Butterfly Areas and in 2004, WWF Turkey published the Important Plant Areas of Turkey listing 122 natural or semi-natural sites of "exceptional botanical richness".

More recently, Doğa Derneği (DD) has applied the Key Biodiversity Area (KBA) approach in order to highlight the priority areas in Turkey for biodiversity conservation and to help target the use of available resources at achieving optimum results from conservation activities.

Key Biodiversity Areas (KBAs) are areas of global importance for biodiversity conservation. The overall goal of the KBA approach is to provide a universal methodology for selecting sites of global significance for nature conservation through the application of standard criteria based upon the principles of species "vulnerability" and "irreplaceability" (Eken *et al.*, 2004).

There are a total of 305 KBAs in Turkey (Figure 2.3) selected for plants, birds, mammals, reptiles, amphibians, freshwater fish, butterflies and dragon flies: 32 are located in the Marmara region, 34 in the Aegean region, 73 in the Mediterranean region, 45 in Central Anatolia, 23 in the central western Black Sea region, 42 in the eastern Black Sea region, 69 in Eastern Anatolia and 19 in South-eastern Anatolia.

The total area of these KBAs is 20.3 million hectares, equivalent to 26% of the territory of Turkey and significantly

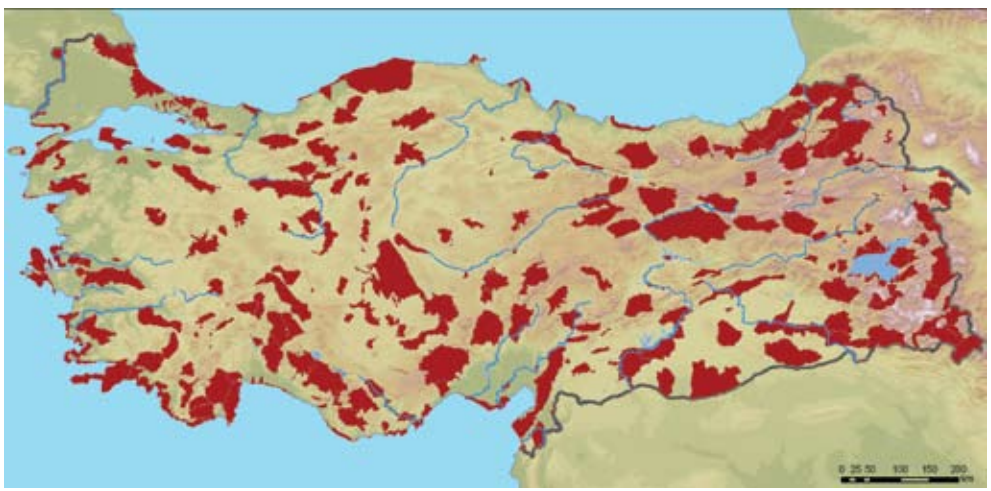


Figure 2.3: Map of Key Biodiversity Areas in Turkey (Source: Doğa Derneği)

greater than the 5.8% of territory designated as protected areas (see Figure 2.3).

Unfortunately the conservation status of the KBAs is less than favourable. Over the past 10 years a total of 5 wetland KBAs (Seyfe Lake, Eşmekaya Marshes, Hotamiş Marshes, Sultan Marshes and Ereğli Marshes) have completely lost and now require restoration (Eken et al., 2006). Another 22 and 46 KBAs are classified as "Very Urgent" and "Urgent" respectively, in terms of the need for conservation action. In other words, almost one quarter (73) of all KBAs are in danger of being permanently lost unless action is taken to reduce the pressure upon them, including from agriculture.

Only two KBAs have improved in conservation status during the last 10 years.

According to Eken *et al.* (2006) the main pressures upon KBAs are:

- national water management policy, notably large dam constructions and the expansion of the area under irrigated agriculture. As a result of these pressures, the nature value of several wetlands (e.g. Seyfe Lake) and steppe KBAs has disappeared or been significantly reduced;
- urbanization near cities and tourism development on the Aegean and Mediterranean coasts;
- overgrazing by livestock, and;
- road constuction.

Additionally, it should not be forgotten that large areas outside of the KBAs are also important for biodiversity and that much of this land is maintained by agriculture (see Section 4).

2.3 Basic Agricultural Profile

A favourable climate and strong farming traditions continue to make agriculture an important sector of the Turkish economy. Although the contribution of agriculture to total GDP declined from 26.1% in 1980 to 9.2% in 2006, almost one third of the Turkish population still remains involved in agriculture and 11% of total exports are agricultural products such as fresh and dried fruit, vegetables, olives and olive oil, tea and hazelnuts.

Approximately half (53%) of Turkey's total area of 77.9 million hectares is currently used for crop and livestock production, including an estimated:

- 26.6 million hectares of cultivated land used for arable crops (cereals, pulses and industrial crops), forage crops for animal feed, fruit and vegetables, vineyards and fallow land. The majority of this cultivated land is privately owned;
- 14.2 million hectares of grasslands and rangelands (dry grasslands). These are predominantly state-owned and used for common grazing, except for some privately-owned meadows which are used for hay-making.

The remaining land area includes an estimated 20.8 million hectares of forest (99% state-owned) and approximately 16 million hectares of non-cultivated land, including built-up areas. Precise data on the distribution of land use

between agriculture and forestry is not available because of the incomplete land cadastre and an unclear division in places between state-owned rangeland and forest land.

According to the classification system developed by the State Institute of Statistics (SIS, 1994) there are nine agricultural zones in Turkey: (I) Central North, (II) Aegean, (III) Marmara and Thrace, (IV) Mediterranean, (V) North East, (VI) South East, (VII) Black Sea, (VIII) Central East, and (IX) Central South.

Figure 2.4: Agricultural Zones (AZ) of Turkey (Source: SIS, 1994)

AZ I	**Central North**	Continental climate with average rainfall of 375 mm/year. Dryland cereals, pulses and forage legume production. Extensive sheep and goats. Intensive dairy cattle.
AZ II	**Aegean**	Mediterranean climate with average rainfall of up to 800 mm/year. Extensive sheep, goats and beef cattle. Intensive dairy cattle. Dryland cereals, olives and figs, plus irrigated cotton.
AZ III	**Marmara and Thrace**	Dryland cereals, sunflower, olives and vegetables. Important cattle region with many pure and cross-bred animals for milk and meat production. Proportion of pasture areas are only 9% of total land area. Average rainfall of 700 mm/year.
AZ IV	**Mediterranean**	Western coastal area. Average rainfall of up to 700 mm/year. Dryland and irrigated cereals, olives, cotton, citrus and maize. Livestock less important, except for goat meat production.
AZ V	**North East**	Hilly and mountainous high altitude area. Coldest part of the country with 100-180 days of frost/year. Pastures occupy 75% of the total land area. Extensive livestock production. Subsistence cereal production.
AZ VI	**South East**	Large fertile plains in the southern part. The biggest irrigation project (GAP Project) in Turkey is leading to increased use of irrigation. Extensive sheep production. Dryland cereals and pulses, plus irrigated cotton.
AZ VII	**Black Sea**	Average rainfall of 1 500 mm/year. Hazelnuts, vegetables, maize and tea. Significant local cattle production and extensive sheep production.
AZ VIII	**Central East**	Dryland cereals and pulses. Extensive sheep and goat production. Local and cross-bred cattle for milk. Average rainfall of 400 mm/year and 80-120 days of frost/year. Pasture areas cover 54% of the total land area.
AZ IX	**Central South**	Extensive sheep and goats. Intensive dairy cattle. Dryland cereals, pulses and forage production. Average rainfall of 350 mm/year and 80-100 days of frost/year.

The main characteristics of the agricultural zones (AZ) shown in Figure 2.4 are as follows (Karagöz, 2006):

Most agricultural holdings are found in the coastal regions of the west (Aegean region) and north (Black Sea region) where the climate is most favourable for intensive horticultural production, including fruits, vegetables, nuts and tea (EC, 2003). Approximately 4.9 million hectares of land are currently under irrigation, since without irrigation much of the land can only support low-yielding dryland crops. The largest area of irrigated land is currently found in Konya with more than 400,000 hectares.

The majority of farms are typically small-scale and fragmented, except in the more prosperous and fertile coastal regions. According to data from the 2001 Agricultural Census (EC, 2003):

- average farm size is 6.1 ha;
- over 83% of farmers have less than 10 hectares of land (occupying approximately 42% of the total cultivated land);
- less than 1% of farms have greater than 50 hectares (occupying approximately 17% of total cultivated area). This includes the large-scale, specialised horticultural producers located in the Aegean and Mediterranean regions.

Subsistence and semi-subsistence farming is an important characteristic of Turkish agriculture and is crucial for providing income security and livelihood to the majority of the rural population. However, these farms are also characterised by low productivity, high hidden unemployment and low competitiveness. The majority of the sector is also "informal" with only a small minority of farmers paying income tax or participating in the national self-employed social security scheme (OECD, 2006). They are also difficult to reach with traditional market and price policies because they only market a small part of their production.

Consequently there is an important need to develop alternative sources of income and new employment opportunities in rural areas. This is especially important since the number of farms is decreasing rapidly as rural people migrate to the urban areas. Between 1991 and 2001 the total number of farmers in Turkey declined by 25% from 4.1 million to 3.0 (EC, 2003) and this trend looks likely to continue.

Crops are the most important agricultural product and contribute approximately 55% to the total value of agricultural production. With the diversity of environmental conditions, farmers are able to produce a huge variety of fruits, vegetables, cereals and industrial crops such as cotton, sugar beet and tobacco. In terms of land use, the most widely grown crops are cereals, especially wheat. But in terms of economic output (including exports), the most valuable crops are fresh and dried fruits and nuts, including citrus fruits, grapes, olives and hazelnuts.

Livestock farming is also an important part of the agricultural economy

producing meat (mainly chicken and beef), milk, eggs, wool and hides for leather. Wool is an important export product and traditional local sheep breeds produce a coarse wool suitable for carpets and blankets. Most livestock farming is undertaken as a small-scale activity alongside crop production. For example, according to the 2001 Agricultural Census, 67% of all farms are mixed with both crop and livestock enterprises, whereas only 2% are specialised exclusively in livestock production (EC, 2003).

According to the latest figures (MoARA, 2006a), around 7.5 million people (11% of the total population) live in more than 20,000 villages in or around state-owned forest areas. These "forest villages" are some of the poorest communities in Turkey and have received special governmental support since the 1950s, including the establishment of development co-operatives and special privileges for working in the state forestry operations. Many of the villagers are also farmers making a living from grazing the natural grasslands in the forests and cultivating small plots of poor quality arable land (many of which have been cleared from the forest).

Turkey has a strong and rapidly developing organic farming sector that supplies half the world's organic cotton as well as fruits, vegetables, herbs and many other organic foods. More than 14,000 organic producers farm 0.6% of Turkey's agricultural land with total sales of €60 million (100 million YTL). More than 85% of the organic produce in Turkey is exported with a value of €50 million, equivalent to 0.8% of all Turkey's food exports. The market for organic food in Turkey is around €10 million and sales of organic food in Turkey through organic farmers' markets, direct supply and supermarkets are all increasing.

2.4 Main Changes in Turkish Agriculture since the 1950s

The relationship between agriculture and the environment in Turkey has a long history, but this relationship has been changing as agriculture has changed in response to a number of external factors or "driving forces". In common with most industrialized countries, these changes have occurred most rapidly in Turkey during the last 50-60 years and have put significant pressure upon the natural environment.

Four major agricultural changes since the 1950s have had (and in some cases are continuing to have) greatest impact upon the environment. These are the:

- expansion of cultivated land;
- increased use of chemical inputs;
- increased use of irrigation, and;
- loss of traditional agriculture.

The impacts of these agricultural changes upon the environment are reviewed in more detail in Section 2.5.

The first three main changes have been driven directly by the agricultural policies adopted by the Turkish government up until the late 1990s which, according to Çakmak (1998),

were consistently based upon three key objectives:

- to increase yields and production levels through the expansion of cultivated land, promotion of the use of chemical inputs, provision of subsidized credits and public investment in irrigation;
- to increase agricultural incomes and achieve income stability, and;
- to achieve self-sufficiency.
- The two most widely used policy instruments for achieving these objectives were until recently:
- output price support – notably for cereals, tobacco, tea and sugar beet (although agricultural co-operatives also received subsidised government loans to purchase other specific products such as cotton, hazelnuts and raisins)
- input subsidies, including price subsidies on fertilisers, seeds and pesticides, plus irrigation subsidies for operational and maintenance costs.

Since the start of the Agricultural Reform Implementation Project (ARIP) in 2001, there has been a major shift in agricultural policy towards the establishment of an "organised, highly competitive and sustainable agricultural sector which considers economic, social, environmental and international development as a whole within the framework of efficient resource utilisation" (MoARA, 2006a).

These reforms are on-going and compatible with the economic and social orientation of Turkey towards the European Union (EU).

2.4.1 Expansion of Cultivated Land

In 2006, the total population of Turkey was almost 73 million, more than double that of 1970 and over five times that of the first population census in 1927. This rapid growth in population, particularly since the end of the Second World War, stimulated a major expansion in the area under cultivation. The cultivated area increased from about 8 million hectares in the 1920s to nearly 19 million hectares in 1952 and to almost 27 million hectares by 1991 largely through the cultivation of rangelands.

From the late 1940s, Turkey began to import large numbers of tractors which made it feasible to expand the cultivation of more marginal land, especially the rangelands traditionally used for grazing on the Anatolian Plateau. In 60 years the area of rangeland was reduced by over 70% from 44.2 million hectares in 1940 to 12.4 million hectares in 2000 (Karagöz, 2006). Although this significantly increased crop production in the short-term, it created long-term problems for livestock production because of the loss of grazing area. It also resulted in the destruction of tree cover and the ploughing of steep land. These were all factors that contributed to the emerging problem of accelerated soil erosion (section 2.5.1).

2.4.2 Increased Use of Chemical Inputs

There was a huge and continuous increase in fertiliser use in Turkey between 1961 and 2000 with total

consumption rising from 0.07 million to 2.1 million tonnes of plant nutrients (Güler, 2006). A similar trend is also assumed to have occurred with pesticide use.

However, when calculated as an average across all cultivated land, fertiliser and pesticide use in Turkey is still relatively low compared to other countries. Average pesticide use is equivalent to about 1 kg of active ingredient per hectare, which is below the levels in other Southern European countries and far lower than the levels of countries that employ pesticides intensively (OECD, 1999). Average fertilizer use is 67.8 kg of nitrogen and 28.9 kg phosphorus per hectare. Use has also been declining in recent years due to the phased removal of price subsidies on fertiliser and pesticide

inputs. For example, the fertiliser subsidy was reduced from 45% in 1997 to 15% by 2001 (Çakmak, 2004). However, use is expected to increase again in response to the continued expansion of irrigated land (Lundell et al., 2004) and rising world market prices for cereals.

These average figures also disguise considerable variation across regions and crops.

For example, consumption of fertilizers and pesticides is significantly higher in the more intensively farmed regions of Marmara, Aegean and the Mediterranean where it is estimated that 42% of all fertilizers are consumed and 73% of all pesticides (Lundell et al., 2004).

Likewise with crops, although over 50% of all nitrogen fertilizers are applied to dryland wheat and barley (due to their huge area of cultivation) the average application rates for vegetables (194 kg N per hectare) and industrial crops (175 kg N per hectare) are significantly higher (Güler, 2006). The over-application of fertilizers in commercial greenhouses is a very common problem.

2.4.3 Increased Use of Irrigation

During the last 40-50 years there has been a steady increase in the area of agricultural land under irrigation, from approximately 1.3 million hectares in 1965 to 4.9 million hectares (18% of cultivated land) in 2005. The maximum area considered to be economic for irrigation is 8 million hectares and further increases in the irrigated area are therefore foreseen. The largest increases are anticipated within the South-eastern Anatolia Project (GAP) – a huge regional development which aims to develop an area of more than 7 million hectares within the basins of the Dicle (Tigris) and Firat (Euphrates). The aim is to irrigate 1.7 million hectares and 10% of this target has already been met. The Atatürk Dam alone can irrigate 882,000 hectares. The GAP project will have a series of positive and negative environmental impacts caused by dams and lakes, demographic changes, irrigation projects and increased availability of domestically produced hydroelectricity.

Most irrigation water in Turkey is delivered by gravity flow and only 5% by pumping. Larger farms (1% of farmers use 15% of the irrigated land) tend to be irrigated from dams and reservoirs constructed with government subsidies, while smaller farmers are more likely to irrigate using water pumped from wells constructed at their own expense. Many of these wells are illegal.

Irrigation in semi-arid climatic conditions is not only important for sustaining crop yields, but it is also the main factor influencing the intensity of farming. Irrigation is always followed by the introduction of higher yielding crop varieties and an increase in production inputs, such as fertilizers and pesticides.

Taking irrigation as the main indicator of crop production intensity in Turkey, the Ministry of Agriculture and Rural Affairs (MoARA) has estimated that:

- intensive crop production is practiced on 4.1 million hectares of fully irrigated land (15% of cultivated land);
- semi-intensive crop production is practiced on 0.8 million hectares of insufficiently irrigated land (2.9% of cultivated land), and;
- extensive crop production is practiced on the remaining 21.7 million hectares of unirrigated, rainfed land (dryland farming) (81.5% of cultivated land).

A system of flood irrigation is used on most irrigated land (Çakmak et al. 2004), but this is highly inefficient and up to 60% of applied water is lost. The introduction of more efficient low pressure sprinklers and drip irrigation technology is therefore an urgent priority, but uptake has so-far been limited to less than 10% of the irrigated land and mainly only on horticultural crops (OECD, 2008).

2.4.4 Loss of Traditional Agriculture

Historically, the impact of Turkish agriculture upon the environment was relatively benign. Turkish farmers have a very long tradition of cultivating land and herding animals. Until the

early 1950s, more than 80% of the inhabitants of Turkey still lived in villages. The land they cultivated was a mosaic of small plots with complex patterns of land ownership and tenure, whilst their livestock grazed the huge areas of semi-natural grasslands and rangeland vegetation. In other regions, such as the Black Sea coast, peasant farmers settled in villages in the forests making a living from timber and the animals they grazed in the forest.

As already noted in Section 2.3, much of this traditional agriculture still remains in the form of subsistence and semi-subsistence farms. These small-scale farms create many positive benefits for the environment, including a) the preservation of genetic diversity in the form of traditional crop varieties and local breeds of farm animals and b) the on-going maintenance of so-called High Nature Value (HNV) farmland – an important new concept for Turkey which is explained in more detail in Sections 3 and 4.

But subsistence and semi-subsistence farming is a way of life that is now rapidly changing as agriculture continues to modernize and small-scale farming is abandoned by an increasing number of people because of the poor socio-economic conditions in the rural areas compared to the cities. The average rural income in 1987 was 24% lower than the average urban income. This difference had increased to 42% in 2004 and is a trend that continues to attract people to leave their villages for the cities, as well as reinforce the traditional flow of people from the less-developed east of the country to the more developed west.

Between 1990 and 2000, almost 8% of the population (almost 5 million people) moved between provinces from predominantly rural areas to predominantly urban areas. Many of these were small-scale farmers and their families – a loss which represents a potential pressure upon the environment (and associated cultural heritage) because the abandonment of their farms also means losing the genetic diversity of crops and livestock (see 2.5.4 below), as well as the traditional farming practices necessary to maintain HNV farmland.

2.5 Impact of Turkish Agriculture upon the Environment

2.5.1 Soil

Soil erosion is a natural phenomenon in Turkey and a number of regions are very prone to wind and water erosion due to the combination of various factors including high altitude, steep slopes,

the uneven patterns of precipitation and rainfall intensity, shallow and stony soils, low organic matter content of soils, limited natural vegetation cover and natural disasters, such as forest fires and landslides.

However, this problem has increased significantly due to accelerated erosion caused by poor land management. Consequently, 66.9 million hectares (86%) of the total land area are now affected by some degree of erosion and 45.7 million hectares (59%) are affected by "severe" and "very severe" erosion where the top soil and up to 75% of the sub-soil is eroded (Özden et al., 2000). It is estimated that 1 billion tonnes of soil and 87 million tonnes of plant nutrients are lost each year due to soil erosion (OECD, 1999).

Soil erosion is now one of the most serious environmental problems in Turkey. The main causes of accelerated soil erosion are:

- Deforestation - due to forest fires, illegal logging and over-use for firewood, clearance for agriculture, tourism development, urbanisation and road building etc;
- Overgrazing of rangelands (especially on hillsides) – this problem has developed since the 1940s and 1950s due to a sharp increase in livestock numbers combined with the significant decrease in the area of rangeland following the expansion of cultivated land (see 2.4.1 above). For example, the average stocking rate on rangelands was estimated to increase from 0.5 livestock units per hectare in 1935 to 1.3 livestock units in 1970 (Munzur, 1987). This trend has continued and it is estimated that the number of animals grazing on rangelands is currently 3-4 times more than their carrying capacity (Karagöz, 2006);
- Mismanagement of cultivated land – due to inappropriate tillage, stubble burning, the abandonment of terracing and inappropriate/excessive irrigation.

Soil erosion is one key element of "desertification" which is the process of land degradation in dryland areas where previously stable environments are degraded by human activity through erosion, over-grazing, over-cropping, poor irrigation practices and deforestation, combined with changing climate.

Desertification is a huge environmental problem for many countries and is linked to numerous other environmental concerns, including the loss of biological diversity and the depletion of water resources. As such, it contributes to a decline in environmental quality that can become progressively worse unless drastic and immediate efforts are taken to correct it.

2.5.2 Water

There are two aspects to the impact of agriculture upon water resources – agricultural water use and agricultural pollution.

Water use is one of the most critical environmental issues facing Turkey.

The pressure on water resources is increasing all the time due to global climate change, rapid population growth and changes in water consumption habits due to increasing socio-economic development and growing urbanisation, and the increasing demands of agriculture and the tourism industry.

Agricultural water use in Turkey increased by 65% between 1990 and 2001 (OECD, 2008). This was largely due to the steadily increasing area of irrigated land over the last 20 years linked to a number of major dam construction and irrigation projects. Unfortunately, some of these projects were undertaken with little consideration of their environmental impact and led to the loss of valuable ecosystems (see 2.5.3 below), as well as increasing problems of soil salinity and agro-chemical run-off due to over-irrigation in certain areas (OECD, 2008).

Although the majority of the water used for irrigation is derived from dams and reservoirs, around 35% is also pumped from groundwater. Over-pumping of groundwater for irrigation is a major problem and many aquifers are being exploited beyond their natural recharge rate, especially in the Mediterranean region. The over-extraction of groundwater in such coastal regions is a growing problem because of a) the intrusion of sea water into aquifers, and b) the growing competition for water resources with other users - notably the tourism industry which, similarly to agriculture, has its peak demand period in the summer (OECD, 1999). Over-extraction is expected to increase in the future putting even greater pressure upon groundwater resources.

Levels of water pollution caused by agriculture are generally considered to be low, but can be a problem in certain regions. For example, in those irrigated areas of the Aegean and Mediterranean regions which are most intensively farmed. However, it is difficult to identify clear trends in water pollution from agriculture due to a) the lack of water quality monitoring data from rural areas, and b) pollution from other sources, notably wastewater from rural municipalities which are commonly discharged (often untreated) into surface waters.

There is no information on typical

nutrient management practices by farmers, including the use soil testing or manure storage facilities. It is likely, however, that uptake rates of these practices are low as many farmers have poor access to capital to invest in manure storage and inadequate knowledge of basic nutrient management.

2.5.3 Biodiversity

The long history of traditional agriculture in Turkey has created many important semi-natural habitats and there are huge areas where low intensity agriculture still provides an important habitat for wildlife. Traditional farming practices are particularly widespread in East, South-eastern, Central Anatolia and Thrace and Aegean high altitude villages. Great Bustard habitats and breeding areas can be found in certain dryland cropping and pasture areas. In the Kulu region in Central Anatolia, grazing has provided the optimum length of grass for Great Bustard (*Otis tarda*), Little Bustard (*Tetrax tetrax*) and other regional species. Another example is in Akçakale, where good habitats for goitered gazelles (*Gazella subgutturosa*) are offered by dry agricultural and grazing activities.

These are all examples of so-called High Nature Value (HNV) farming systems and are discussed in more detail in Sections 3 and 4.

Unfortunately much of this valuable farmland has already been lost due to the expansion and intensification of crop production, whilst that which remains is in danger of abandonment due to the steady decline in the economic viability of farmers practicing traditional farming methods.

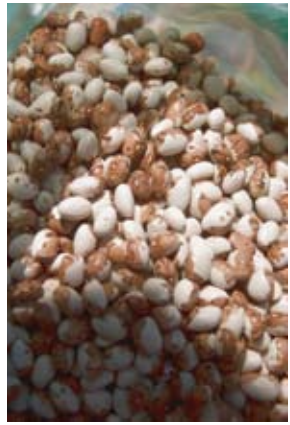
It is widely recognized that the expansion of agricultural land and the increased use of irrigation have both contributed to widespread habitat destruction and loss of flora and fauna during the last 50-60 years (MoE, 2000; Ozturk *et al.*, 2002). The greatest damage has been caused to grassland and wetland habitats through the direct and indirect effects of:

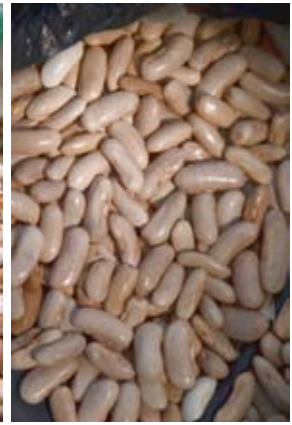
- the ploughing of semi-natural (grasslands and maquis) habitats on rangelands and other areas to create arable land;
- the over-grazing of remaining rangelands due to the increased stocking rates resulting from the reduced areas available for grazing;
- the draining of wetlands for conversion to agricultural land;
- the diversion of water flows away from wetlands towards dams and irrigation projects;
- the excessive extraction of groundwater for irrigation reducing water flows to wetlands;
- the flooding of sensitive habitats due to the construction of dams for irrigation;
- water pollution from agricultural run-off containing nutrients and pesticides.

The full extent of the impact of these actions upon Turkey's biodiversity are not known, but according to MoE (2000) at least six indigenous plant

species are now extinct due to agriculture-related activities. Of these extinctions, two occurred as a result of dam construction for irrigation projects and four because of overgrazing and habitat destruction. As already noted in 2.2, one of the most significant pressures upon KBAs is the water management policy for agriculture, including large dam constructions and the expansion of the area under irrigated agriculture (Eken *et al.*, 2006). Around 40% of the most significant threats to the 184 Important Bird Areas (IBAs) in Turkey are estimated to originate from farming, with the main threats including intensification of production from greater use of agro-chemicals; loss of semi-natural farmed habitat to other uses; and construction of irrigation projects (OECD, 2008).

There are numerous examples of other individual species that have been threatened by agricultural change and are now in need of conservation. These are often located in a few limited areas. One example of such a species is the Great bustard (*Otis tarda*), a species that used to be found throughout most steppic and agricultural areas up until 50 years ago. Now, its presence is limited to 20-30 sites in Turkey. These few remaining sites are generally the last large patches of Anatolian steppes and areas where traditional agricultural practices continue and where hunting activities remain minimal.





2.5.4 Genetic Diversity in Agriculture

Turkey is one of the most significant countries in the world regarding agricultural genetic diversity and resources. Many annual and perennial, herbaceous and woody plants used in Mediterranean and temperate agricultural systems originate from Turkey and the country is recognised as a "centre of domestication" where ancient agriculture started several thousand years ago (Tan, 2003). Important crops originating from Turkey include wheat, barley, oats, peas and lentils, plus many cultivated fruit species such as cherries, apricots, almonds and figs. Turkey is also home to a number of ornamental flowers, the most notable being the tulip.

There are two aspects to Turkey's significance as a centre of crop genetic diversity.

Firstly is the continued existence of many wild relatives of cultivated crops. There are 5 "micro-gene centres" where most wild relatives occur (Şehirali,

2005):

- Thrace-Aegean – various different types of wheat, chickpeas, lentils, broad beans, vetch, lupin, melon and fruit trees;
- South-eastern Anatolia – wheat, barley, oats, chickpeas, lentils, lucerne, apples, grapevines, melon, cucumber, broad beans and fodder plants;
- Samsun region, Middle Black Sea - fruit trees, lentils, beans and leguminous fodder crops;
- Kayseri region, Central Anatolia – apples, almonds, pears, grapevines, lentils, chickpeas, clover and sainfoin;
- Ağrı region, Easthern Anatolia – apples, apricots, sour cherry, melon and leguminous fodder crops.

Secondly, high levels of genetic diversity still exist amongst local cultivated crop varieties. This is especially so in the more marginal mountain areas where traditional farming methods have been maintained to a much greater extent than in the intensively cultivated coastal regions or the Anatolian plateau. Rural communities farming in more marginal circumstances value their local crop varieties very highly since they are adapted to local conditions and thrive on the poor soils, steep slopes and higher altitudes. However substantial genetic erosion is occurring because of the on-going abandonment of rural areas and, where farming continues, because of the introduction of high-yielding varieties.

A National Plant Genetic Resources Programme for the conservation and utilization of crop genetic resources has operated since the 1960s (Tan, 2003). This has focused upon ex situ conservation and the collection of seeds and vegetative material to establish a huge gene bank of almost 60,000 samples in 16 research institutes,

During the 1990s it was planned to complement this approach with a programme of in situ conservation based upon the establishment (with management plans) of Gene Management Zones (GMZs) in selected areas that were rich in key wild crop relatives. Highest priority was to be given to globally significant non-woody crops including wild wheat, barley, chickpea and lentils, as well as important woody species such as pear, walnut, chestnut, olive, apple and pistachio. Unfortunately due to insufficient resources and lack of institutional capacity the proposed GMZs were not implemented, however a National Plan for the In Situ Conservation of Plant Genetic Diversity in Turkey (including the GMZ concept) was finalized in 1997 (Kaya *et al.* 1997).

Turkey is also rich in animal genetic diversity associated with the many native breeds of livestock, although no sufficient survey of animal genetic diversity has been conducted and there is very little data available on the characteristics of native breeds. However, it is estimated that there are 20 indigenous cattle breeds, 19 sheep breeds and 5 goat breeds – of which 14 cattle breeds, 2 sheep breeds and 2 goat breeds have been lost (Ertuğrul

et al, 2005). The main threat to low-yielding native livestock breeds is that they are being progressively replaced by high-yielding breeds through artificial insemination and the importation of live animals.

2.6 Existing Responses to the Environmental Impact of Turkish Agriculture

Environmental issues, including those relating to agriculture, only began to be effectively addressed by the Turkish government during the 1990s (OECD, 1999). However, with the adoption of various international commitments, plus the prospect of becoming a member of the European Union, the environment is becoming increasingly important on the political agenda.

The following sections summarise some of the existing responses to the environmental problems associated with the changes in Turkish agriculture over the last 50-60 years. These responses are grouped under 3 main headings:

- Regulatory Responses – these use the national legal system to establish norms/standards, regulations and prohibitions etc. that farmers are required to comply with;
- Economic Responses – these use financial incentives (and disincentives) for changing the management practice of farmers;
- Advisory/Information Responses – these use information and advice to encourage farmers to voluntarily change their farming methods.

2.6.1 Regulatory Responses

The concept of sustainable development was first acknowledged by Turkish policy-makers in the 6th Five Year Development Plan for Turkey (1991-1995) which stressed the importance of integrating environmental objectives into a range of policies. During the following years a number of regulations controlling specific agricultural practices were introduced. For example, the burning of cereal stubble in dryland areas became illegal and a compulsory interval between pesticide application and crop harvesting was established (Tanrivermis, 2003). However, there is little information available about the compliance of farmers with these regulations.

In response to concern about the poor condition of rangelands as a forage resource for livestock production, the Rangeland Act (No. 4342) was adopted in 1998. This is an innovative regulation that aims to promote more sustainable rangeland management by:

- requiring the area and boundaries of all rangelands in common use to be determined and delimited;
- allocating the right to use these rangelands to one or more villages or municipalities;
- setting up a Provincial Rangeland Commission in the Agricultural Directorate of each Province to supervise rangeland management;
- promoting decentralized management and locally-based decision-making about the rangelands through

partnership between the Provincial Rangeland Commission and local community "organisations" (e.g. the village muhtar);
- introducing a fee for grazing the rangelands, plus compulsory management requirements (e.g. calculation of carrying capacity, rotational grazing, avoidance of over-grazing, maintenance of boundaries etc.), and;
- establishing a Rangeland Fund as a source of finance for management and improvement of the grazing land, including the implementation of "rehabilitation" projects (including re-seeding and fertilizer application) in co-operation with delegated pasture research units.

The Rangeland Act is supported by a national Rangeland Project which is developing an inventory of rangeland vegetation and mapping the distribution of rangelands according to their productivity and carrying capacity.

There is no doubt that the Rangeland Act is an important piece of legislation for promoting the conservation and improvement of rangeland as a source of forage, but a) it does not specifically address environmental issues and b) its implementation over the last 10 years has been very slow.

More recently, preparations for the possibility of EU membership have been an important motivation for new regulations on agriculture and the environment. This includes the "Regulation on the Protection of Waters against Pollution caused by Nitrates from Agricultural Sources" (adopted February 2004) and the "Regulation on Good Agricultural Practices" (adopted September 2004). These are both in accordance with EU principles and legislation.

The Ministry of Agriculture and Rural Affairs (MoARA) is also working in partnership with the Ministry of Environment and Forestry (MoEF) to develop the concept of "cross compliance" for agricultural support payments in accordance with EU principles and practice.

Another important area of progress is the regulation of organic farming.

Over the past 15 years, MoARA has adopted a strong and effective approach to the support of organic farming. Before this time, government showed little interest in the organic sector, which was largely unregulated and developed only slowly. In 1994, the establishment of the Alternative Agriculture Techniques and Production Department (ATUT) in MoARA and the publication of Turkey's first organic farming legislation started a period of rapid development of policy and control. This was originally driven by the publication of the EU Organic Regulation (No. 2092/91) and is now being updated to take account of the new EU Organic Regulation (No. 834/2007).

Despite this increase in regulatory responses during the last 10-15 years, there is still much room for improvement and recent Five Year Development

Plans have acknowledged the need for additional policy measures to promote more environmentally-friendly farming methods, including economic incentives for environmental management.

2.6.2 Economic Responses

An important element of agricultural policy in the past was subsidising inputs such as capital for agricultural machinery, fertilizers, pesticides and water. These subsidies were originally implemented with no consideration of their environmental impact, although awareness of their negative impacts did increase amongst Turkish policy-makers during the 1990s (OECD, 1999).

The rural policy should be "to diminish negative impacts of agricultural production to the environment" and encourag8th Five Year Development Plan (2001-2005) for Turkey specifically stated that one of the main concerns of agriculted a decrease in support for fertilisers and pesticides, plus an increase in the promotion of organic farming and integrated pest control management (SPO, 2001).

In an ambitious programme of policy reform implemented through the Agriculture Reform Implementation Project (ARIP), the previous system of output price support and input subsidies has been replaced by a new range of agricultural support instruments for 2006-2010 which are allocated not less than 1% of Gross National Product (MoARA, 2006a). These new support measures include:

1. Direct Income Support (DIS) Payments - 45% of the state agricultural support budget is allocated to a system of area-based Direct Income Support (DIS) payments linked to a new computerised National Farm Registry System. State-owned land, abandoned agricultural land and communal property such as rangelands are all excluded from DIS payments.

2. Environmental Support Payments - 5% of the state agricultural support budget is allocated to promoting better environmental management by farmers. These payments have been piloted (2005-2008) with World Bank funding in the ÇATAK (Environmentally-based Agricultural Land Protection) Programme implemented on a total of 5,000 hectares in 4 pilot areas of:

- Seyfe Lake, Kırşehir Province,
- Kovada Lake Canal Area, Isparta Province
- Ereğli Marshes, Konya Province
- Sultan Marshes, Kayseri Province

The ÇATAK programme is described in more detail in Section 6.3 since it has the potential to become an important component of Turkey's future National Agri-environment Programme.

There are also two additional measures providing financial support to certified organic farmers:

- a supplement of 30% is available on the DIS payment for certified organic farmers who have land in the National Farm Registry System. There is no specific support for farmers during the

conversion period (as exists in EU member states);
- loans with a 60% discounted interest rate are available from the Turkish Agricultural Bank (Ziraat Bankasi) for certified organic farmers who require finance for running costs or investment. A total of 35.1 million YTL was available under this scheme from 2004 – 2007.

2.6.3 Advisory and Information Responses

The Ministry of Agriculture and Rural Affairs (MoARA) provides extension and advisory support to farmers on environmentally-friendly farming methods through the wide ranging network of 81 Provincial Offices. This includes advice on organic farming and integrated crop production protocols, such as EUREPGAP[1] . This is supported by a comprehensive research and development programme which is being carried out in 29 research institutes. For example, in 2006, the total funding for research on organic farming amounted to approximately 400,000 YTL and covered a wide range of topics, with the majority being spent on organic fruit and vegetable production research (Stopes et al., 2007).

There is also a training protocol between the State Hydrological Works (DSI) and the MoARA which aims to reduce the pollution of water supplies by increasing the area of organic farming in sensitive water catchment areas. The protocol provides for DSI to identify target areas and for MoARA to provide farmer training, knowledge transfer, liaison with certification bodies and the training of DSI experts. During 2004-2006, a total of 332 training events were held under this protocol involving 4,797 farmers. Subsequently 813 of these farmers converted more than 5,500 ha

[1] *EUREPGAP is a private sector organisation that sets voluntary standards for the certification of agricultural products around the world based upon the principles of "good agricultural practice" using Integrated Pest Management (IPM) and Integrated Crop Management (ICM) production techniques.*

to organic farming. The protocol started with 13 catchments and has recently been increased to 20.

2.7 Conclusions

Good progress has already been made with the integration of environmental concerns into Turkish agricultural policy, but significant advances in the promotion of more sustainable agriculture can still be made.

The impact of the Agriculture Reform Implementation Project (ARIP) in shifting agricultural support away from price support and input subsidies to Direct Income Support (DIS) payments is a significant step forward for reducing the overuse of pesticides and fertilizers. However, measures should be put in place to avoid the risk of farmers increasing the cultivation of marginal areas which are vulnerable to soil erosion or have nature conservation value in order to claim additional DIS payments.

Equally the Rangeland Act 1998 is very important for the encouragement of more sustainable rangeland management. The Act both prohibits many "bad" practices and also puts in place a) the democratic and decentralized processes at village level necessary for the implementation of good practice and b) a close linkage between field-based applied research and an active advisory/extension service at village level. However, the full impact of the Act is currently limited by poor uptake and implementation.

Support for organic farming is strategically very important, both economically and also for the environment. And the pilot ÇATAK programme offers huge potential for encouraging more sustainable land management practices in those areas that are most vulnerable to poor soil and water management.

Despite these positive developments, three important observations should be made:

- although it is understandable that the priorities for environmental management in agriculture are soil and water it is important not to overlook biodiversity. It should not be assumed that nature conservation only occurs within protected areas or Key Biodiversity Areas (KBAs). High levels of biodiversity, including many endangered species of plants and animals, are also dependent upon the low intensity management of farmland outside of protected areas;
- there appears to be very little integration of existing initiatives and measures for the encouragement of more environmentally-friendly farming, including poor awareness and communication between the ministerial departments responsible for different initiatives;
- there are many positive environmental benefits associated with subsistence and semi-subsistence farming, but this is the agricultural sector that is under greatest threat in Turkey.

Section 3

High Nature Value (HNV) Farming in the European Union

The concept of High Nature Value (HNV) farming is attracting increasing interest from environmentalists and policy-makers in Europe because of its importance for biodiversity conservation. The concept is described in more detail below, whilst Section 4 provides guidance on applying it in Turkey.

3.1 What is HNV Farming?

The concept of "High Nature Value" (HNV) farming has emerged and developed over the last 10-15 years in response to the growing recognition that certain types of farming are also valuable for wildlife and for maintaining biodiversity.

HNV farming systems were first described by Baldock et al. (1993):

"High Nature Value (HNV) farming systems are 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 common understanding that farming activities have a mainly negative impact on biodiversity and recognizes instead that:

- many of the habitats upon which we place high nature conservation value in Europe have actually 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 brings an alternative and complementary approach to conventional 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 with traditional farming methods.

However, whilst HNV farming is an increasingly popular and attractive concept for communicating the biodiversity benefits provided by certain types of farming, there remain many "challenges" associated with putting this concept into practice. Not least of which is the fact these types of 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, low rainfall etc. Those farmers who deliver the greatest biodiversity benefit are therefore typically farming under the most difficult circumstances (social, economic 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 change of land use.

3.2 Defining the Types of HNV Farmland

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

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

HNV farming systems in these areas are typically characterized 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, fertilizers and pesticides and/or the presence of high densities of grazing livestock greatly reduces the number and abundance 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 in alongside farming activities;
3. Diversity of land cover and land use – biodiversity 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 intensive agriculture.

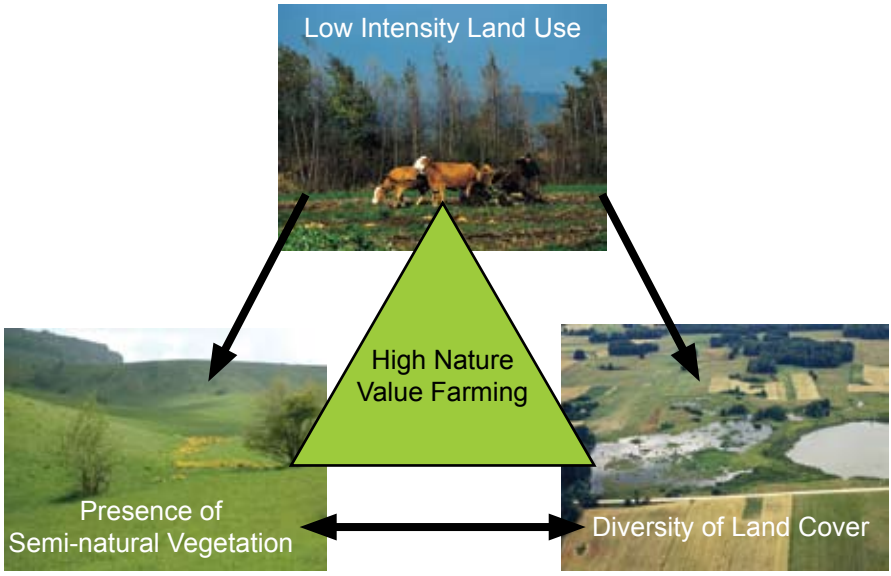
It is not necessary for all three characteristics to be present within one farming system for it to be considered as HNV, instead the three characteristics can be considered to interact as shown in Figure 3.1.

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, however in some situations this may also be found in combination with low intensity cropland to create a mosaic landscape with a greater Diversity of Land Cover than simply semi-natural vegetation.

In line with this approach, three types of HNV farmland are commonly identified (e.g. EEA, 2004):

The definition of three types of HNV farmland is a useful aid to identifying HNV farmland on the ground. However, the three types of HNV farmland are not intended to be precise categories with a sharp boundary between them. Rather they should be seen as a continuum ranging from those with a higher

Figure 3.1



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 3.2.

HNV Farmland Type 1: 100% Semi-natural

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 most widespread type of HNV farmland consists of semi-natural vegetation under low intensity use by grazing livestock, often with traditional local breeds. The grazed semi-natural vegetation may be grassland, scrub or woodland, or a combination of different types. Often the semi-natural grazing is not part of the farm holding, but has some other form of ownership (common land, state-owned land etc).

HNV livestock farms will usually have more than one type of forage land. This can range from the least altered semi-natural vegetation (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 still managed at low intensity compared to mainstream farming. They can be an important part of an HNV farming system and can also contribute to nature value when combined with a sufficient area of semi-natural grazing (Beaufoy, 2008).

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 is to decide that a pasture that has not been resown or fertilised for 20 years (for example) can be

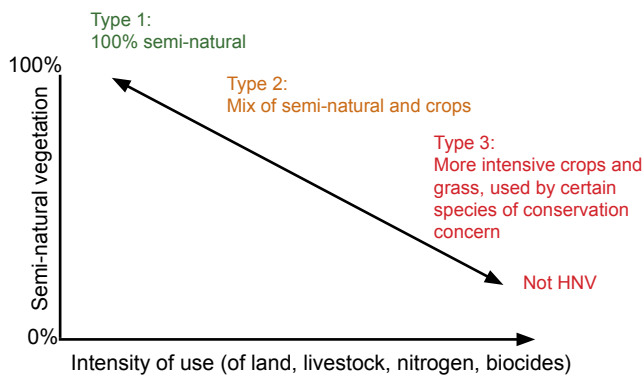


Figure 3.2 The "continuum" of HNV farming types 1, 2 and 3 (Source: Beaufoy, 2008)

considered semi-natural. 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 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 (Beaufoy, 2008).

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.

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 compared to in Type 1, and the proportion of cultivated land is greater, the management of the latter and 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 will lead to a rapid decline in wildlife values (Beaufoy, 2008).

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 and will tend to increase nature value. 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.

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 do not suggest HNV farming, but which nevertheless continue to support species of conservation concern. These are generally populations of bird species, either rare species or a high proportion of European or World populations.

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

The European Environment Agency has preliminarily estimated that around 15–25% of the total agricultural area can be considered to be HNV. However, as shown in Figure 3.3 this is not evenly distributed and much larger concentrations are found in the more peripheral regions of the EU, especially in southern and eastern Europe.

Unfortunately the extent and condition of HNV farmland in Europe declined greatly during the 20th century (with serious knock-on effects 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.

Most recently since the early 1990s, millions of hectares of farmland in central and eastern Europe have been abandoned during the re-structuring of agriculture following the collapse of communism. This abandoned farmland included 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

Figure 3.3
Preliminary distribution map of High Nature Value (HNV) farmland in western and central Europe (Copyright: EEA, Copenhagen, 2007 - available from http://www.eea.europa.eu)

of European importance and many other important habitats (Keenleyside and Baldock, 2007). Prior to this the expansion and intensification of agriculture throughout Europe following the Second World War contributed to a significant loss of biodiversity due to the conversion of grassland into arable land; drainage of wetlands; removal of field boundaries and other unfarmed features to create larger field sizes, and; the increased use of fertilizers 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" (UN/ECE, 2003).

The 2010 biodiversity target is unlikely to be met without additional policy efforts to maintain HNV farming. Indeed, the EU's 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 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 continued to state 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) and the accompanying Community Strategic Guidelines for Rural Development (2007–2013), 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.'

Put simply, there are three basic elements to the 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 the measures for supporting HNV farming that are included in their national rural development programmes.

Section 4

High Nature Value (HNV) Farming in Turkey

This section addresses 4 basic questions of importance to agri-environment policy-making in Turkey:
1. What is the relevance of the HNV farming concept to Turkey?
2. Which types of farming system in Turkey are likely to be HNV and important for the conservation of biodiversity?
3. Where (approximately) does HNV farmland and the associated HNV farming systems occur in Turkey?
4. What are the general characteristics of these HNV farming systems that make them good for nature conservation?

Work on answering these questions was undertaken by a local working group consisting of agricultural and biodiversity experts. There are not sufficient data to allow a detailed and comprehensive identification of all HNV farming across Turkey, but only to establish a general framework for further elaboration in the future, for example by the Ministry of Agriculture and Rural Affairs (MoARA).

The work undertaken involved 3 basic steps:

- development of a generic typology of farming systems in Turkey and the characterization of those farming systems most likely to be HNV;
- using selected indicators to prepare a preliminary map of the possible distribution of HNV farmland in Turkey;
- conducting a limited number of local case studies to examine several HNV farming systems in more detail and identify which farming practices are beneficial for wildlife and biodiversity.

These steps are broadly in line with the methodology for identifying HNV farming systems and farmland that was proposed to the European Commission to assist EU Member States in applying the “HNV farmland indicator” that forms part of the Common Monitoring and Evaluation Framework for national rural development programmes in the current EU programming period of 2007-2013 (IEEP, 2007).

4.1 The Relevance of HNV Farming to Turkey

The HNV farming concept is highly relevant to Turkey. As already noted in Section 2, the long history of traditional agriculture has created many important semi-natural habitats and there are huge areas of the country where low intensity agriculture still provides an important habitat for wildlife.

Furthermore, the HNV concept brings

an alternative and complementary approach to existing nature conservation polices and practices in Turkey. Instead of focusing solely upon the maintenance of rare or endangered species and habitats on protected sites it embraces the need for the significantly larger areas of land (including a high proportion of semi-natural habitats) to continue to be occupied by farmers and managed with traditional farming methods. This approach is highly compatible with Turkey's biodiversity commitments under various international agreements, including the *Convention on Biological Diversity (CBD*).

The CBD is an international convention with the objective of promoting the conservation of biodiversity (including genetic diversity in agriculture) and the fair and equal use of genetic resources. The CBD was signed by 150 countries, including Turkey, in 1992 and commits these countries to two key actions:

1. The development of national strategies and action plans for the conservation and sustainable use of biological diversity, and;
2. The integration (as far as possible and appropriate) of the conservation and sustainable use of biological diversity into relevant national policies.

Turkey ratified the CBD in 1996 and this was described at the time as "a new starting point for recognizing the importance of biodiversity and addressing the issues surrounding it in Turkey". A *National Biodiversity Strategy and Action Plan (NBSAP)* for Turkey was subsequently published in 2001 (NBASP, 2001). This is intended as a national framework for meeting the obligations of the CBD and contains 6 goals relating to i) the conservation and sustainable use of biodiversity; ii) improved understanding of ecosystem management; iii) education and awareness of the need to conserve biodiversity; iv) appropriate incentives and legislation for biodiversity conservation; v) international co-operation with neighbouring countries and beyond; and vi) implementation of the NBSAP.

The NBSAP is an ambitious document and makes specific reference in many places to the importance of biodiversity conservation on agricultural land, especially the remaining steppic rangelands which are identified as one of the 3 priority ecosystems for the NBSAP. Central to the strategy proposed for agricultural areas is strategic action 1.42: "Develop and implement programs that promote and facilitate the co-existence of wild flora and fauna and other wild organisms and their habitats in agricultural landscapes" – in other words (although not specifically written as such), support High Nature Value (HNV) farming systems.

Linked to HNV farming also are strategic actions 1.46 encouraging "policies or programs that conserve biodiversity by supporting the sustainable use of steppes" and 2.3 promoting the use of "traditional

knowledge that is relevant to the conservation of biodiversity and the sustainable use of biological resources" (NBASP, 2001).

Implementation of the CBD in Turkey therefore involves placing much greater value upon farmers 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.

However, whilst the HNV farming concept is a very attractive concept for communicating the biodiversity benefits provided by certain types of traditional Turkish agriculture, there remain many "challenges" associated with putting this concept into practice. Not least of which is the fact that those traditional farmers who currently deliver the greatest biodiversity benefit in Turkey 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.

4.2 Step 1: Developing a Typology of Farming Systems in Turkey

The first step towards applying the HNV farming concept in Turkey is to use available data and expert knowledge to identify and describe the broad types of farming system that are likely to be beneficial for wildlife. This does not

Biodiversity also has an important place in the rural culture of Turkey. A nice example of this are the prayers that are used in some areas of Turkey to start the day and which are accompanied by the sounds of nature. Another prayer used while sowing seeds says "Kurda Kuşa Aşa" (for the worm, the bird and for ourselves). This appreciation of nature through traditional practices has been extremely important for the conservation of biodiversity in Turkey. However changing conditions, such as land fragmentation, economic development and the abandonment of rural areas are threatening the continuation of these traditions and leading to the loss of natural values from low intensity farmland.

need to be an exhaustive or definitive process. Figure 4.1 summarises the basic typology of farming systems in Turkey that was prepared for this project. More detailed descriptions of these farming systems are included in Tables 4.1 - 4.3. The typology was kept as simple as possible and farming systems are classified according to three main criteria: i) the available natural resources; ii) the dominant pattern of farming activities, and; iii) the intensity of production.

The farming systems identified fall into 3 main categories: Crop production, Livestock production and Forest farming. Each of these main categories includes some form of "mixed farming" system and overall it is estimated that in terms of land area:

- around 69% of agricultural holdings practice a mixed crop-livestock system that includes different combinations/ proportions of cultivated plots with grazing livestock on rangeland. This is a large and diverse group of agricultural holdings that is likely to include the majority of the HNV farming systems in Turkey;
- 29% practice specialized crop production, and;
- only 2% practice specialized livestock production.

This is only a preliminary typology, however it does usefully characterize the farming systems that are most likely to be HNV as:

1. Extensive crop production (predominantly HNV Type 2 farmland) - especially including crop rotations using mainly local cultivars of cereals, pulses and forage crops in dryland areas combined with extensive livestock grazing;

2. Extensive livestock production (predominantly HNV Type 1 farmland) - including:

- highland mixed farming systems (rangeland grazing with meadows and forage crops used for hay, plus some cropping) and
- alpine farming systems (grazing on alpine pastures with meadows for hay), including some traditional mountain pastoralism ("yayla");

3. Extensive forest farming (predominantly HNV

Type 1 and Type 2 farmland) – including:

- mixed farming systems (rangeland grazing with meadows and forage crops used for hay, plus some cropping);
- extensive livestock grazing with no cropping;
- traditional mountain pastoralism ("yayla")

These are extremely broad categories, and within each category there will be a considerable range of different farming types and situations. The crop production systems in particular are likely to include many examples that would not be considered as HNV due to the intensity of the production and/or the absence of semi-natural elements. Further work should now be done on developing more precise descriptions of the different HNV farming systems within the typology. This should include a more detailed examination of each system in order to collect more detail on the wildlife values associated with the farming practices that are characteristic of each farming system.

Figure 4.1: Basic Typology of Farming Systems in Turkey (including indication of where HNV farmland is likely to be found)

Crop Production Systems	**Intensive Irrigated**	**Semi-Intensive Dry**	**Extensive**
	Industrial Crops	Cereals + Industrial Crops	Cereals + Pulses
	Cereals, Pulses + Forages	Cereals, Pulses + Forages	Cereals + Forages
	Vegetables	Cereals + Fallow	Cereals + Fallow
	Permenant Plantations	Permenant Plantations	Horticulture- Vegetables
			
	No HNV farmland (unless Type 3 occurs)	May include some HNV Type 2 and Type 3 farmland	Includes some HNV Type 2 farmland
Livestock Production Systems	**Intensive**	**Semi-Intensive**	**Extensive**
	Dairy farming + Concentrated feeds	Mixed farming + Concentrated feeds	Highland mixed farming (some cropping)
	Beef and lamb farming + concentrated feeds	Mixed farming + Forage	Alpine mixed farming (no cropping + "yayla"
		Trans-human (landless)	
			
	No HNV farmland	May include some HNV Type 1 and Type 2 farmland	Predominantly HNV Type 1 framland
Forest Farming System	**Extensive**		
	Mixed farming (some cropping)		
	Livestock (no cropping)		
	Mountain pastoralism ("yayla")		
	Predominanlty HNV Type 1 and Type 2 farmland		

Table 4.1: Typology of the main crop production systems in Turkey (those shaded in grey are most likely to be HNV)

	Production System	Main Crops	Regions	Remarks
Intensive Irrigated*	Industrial Crops - Industrial Crops	Cotton-Oil Crops Maize-Sugar Beet-Oil Crops	Aegean, Mediterranean & South Eastern Anatolia All intensive irrigated land, except Mediterranean	Annual rotations are possible
	Industrial Crops - Cereals	Cotton-Cereals Sugar Beet-Oil Crops-Cereals	Aegean, Mediterranean & South Eastern Anatolia All intensive irrigated land, except Mediterranean	Annual rotations are possible
	Industrial Crops - Forage Crops	Cotton-Forage Crops Sugar Beet + Oil Crops-Forages	Aegean, Mediterranean & South Eastern Anatolia All intensive irrigated land, except Mediterranean	Annual rotations are possible
	Industrial Crops - Tuber Crops	Sugar Beet + Oil Crops-Potatoes Sugar Beet + Oil Crops-Onions Cotton-Peanut	Central &Eastern Anatolia, plus other irrigated highlands Aegean, Mediterranean & South Eastern Anatolia	
	Industrial Crops - Vegetables	Cotton-Vegetables Oil Seeds-Vegetables	Mediterranean & South Eastern Anatolia Aegean, Mediterranean & South Eastern Anatolia	Annual rotations are possible
	Cereal - Vegetables	Wheat + Barley-Tomato-Pepper + Cucumber etc.	Mediterranean, South Eastern Anatolia, Thrace & Central Anatolia	Annual rotations are possible
	Cereal - Pulses	Wheat + Barley-Dry bean	Central Anatolia, Transition, Eastern Anatolia & Black Sea	-
	Cereal - Forage Crops	Cereals-Perennial Forages	Eastern & Central Anatolia, plus Thrace – Transition,	-
	Forage Crops - Vegetables	Alfalfa + Vetch + Silage Maize –Tomato + Pepper + Cucumber	Mediterranean, South Eastern Anatolia, Thrace & Central Anatolia	Annual rotations are possible
	Permanent - Horticulture	Hazelnut Tea Dried apricot Sultanas Dried Fig Soft seed fruits Hard seed fruits Vineyards	Trabzon, Giresun, Ordu, Samsun & Sakarya Rize-Trabzon Malatya & Elazığ Manisa-İzmir, Balıkesir & Aydın Aydın & İzmir Transition, Central & Eastern Anatolia, Aegean, Thrace & Black Sea	-

* *No HNV farmland, unless HNV Type 3 occurs*

	Production System	Main Crops	Regions	Remarks
Semi-Intensive Dry**	Cereals - Industrial crops	Wheat + Barley + Rye + Triticale-Oat Sunflower + Safflower	Thrace, Transition & Central Anatolia South & Eastern Anatolia	-
	Cereals - Pulses	Wheat + Barley + Rye + Triticale-Oat Lentil + Chickpea	Central, South & Eastern Anatolia, Thrace & Transition	-
	Cereals - Forage crops	Wheat + Barley + Rye + Triticale-Oat Vetch + Sainfoin	Central, South & Eastern Anatolia, Thrace & Transition	-
	Cereal - Fallow	Wheat + Barley + Rye + Triticale-Fallow	Central, South & Eastern Anatolia, Thrace & Transition	Most common rotation
	Permanent - Horticulture	Olives Pistachio Chestnut Almond	Eagen, Marmara, Mediterranean & South Anatolia Gaziantep, Urfa & Siirt Aegean & Mediterranean South & Central Anatolia, Transition & Mediterranean	-
Extensive***	Cereal - Vegetables	Wheat + Barley + Rye-Tomato-Pepper-Cucumber etc.	High, narrow valleys of all regions (Local cultivars are dominant)	In irrigated lands
	Cereal - Pulses	Wheat + Barley + Rye + Triticale-Oat Lentil + Chickpea	High, narrow valleys of all regions (Local cultivars are dominant)	In dry lands
	Cereals - Tuber crops	Wheat + Barley-Potatoes + Onions	High, narrow valleys of all regions	In irrigated lands
	Cereal - Forage crops	Wheat + Barley + Rye + Oat- Alfalfa Wheat + Barley + Rye + Oat-Sainfoin + Vetch	High, narrow valleys of all regions (Local cultivars are dominant)	In irrigated lands In dry lands
	Forage crops - Vegetables	Alfalfa + Vetch-Tomato + Pepper + Cucumber + Cabbage	High, narrow valleys of all regions	In irrigated lands
	Permanent - Horticulture	Soft seed fruits Hard seed fruits Olives Pistachio, Chestnut, Almond	High, narrow valleys of all regions (Local cultivars are dominant)	In irrigated and dry lands

** *May include some HNV Type 2 and Type 3 farmland*
*** *Includes some HNV Type 2 farmland*

	Production System	Main characteristics	Regions	Remarks
Intensive*	Dairy farming (specialized farms)	No grazing, farmland is used for forage production only (alfalfa-maize silage and feed grain), Exotic cattle breeds: Holstein, Swiss Brown. Sheep breeds: Avasy, Sakız.	Aegean, Thrace, Transition, Central, Mediterranean & South Aegean & South	Around 4% of all livestock holdings
	Beef and lamb farming	Small farmlands with concentrate and straw-based feeding. Animals purchased from other farms. Cross-breeds are common.	Cattle: Eastern, Transition Central & Thrace Sheep and goats: South, Central & Mediterranean	
Semi-Intensive**	Mixed farming	Mixed livestock and crop production with animal and crop types differing between regions. Farmers may have cattle and sheep together with combined milk and meat production. Small herd/flock size.	Cattle are dominant in Eastern, Transition, Aegean & Black Sea Sheep and goats are dominant in South, Central & Mediterranean	The most common system in the country
	Transhumance	In general landless farmers. Only sheep reared for milk and meat. Land is rented.	Summer grazing in Eastern. Wintering in South with stubble grazing	Small number of holdings, but larger herds
Extensive***	Highland mixed farming	Some cropping, small paddocks and a production mosaics. Livestock production is the dominant income generating activity. Cross and local breeds are common	Cattle: Eastern, Transition, Aegean & Black Sea Sheep: South & Central Goats: Mediterranean & Central	Small number of holdings
	Alpine farming	No cropping, just a small forage area. Winter feed is provided by natural high meadows. Cattle production is the dominant system, but small ruminants are reared in mixed system. Seasonal grazing in temporary residential areas(Yayla) is common in Eastern Anatolia, Black Sea & Mediterranean	Cattle: Eastern, Transition, Aegean & Black Sea Sheep: South & Central Goats: Mediterranean & Central	Small number of holdings

Table 4.2: Typology of the main livestock production systems in Turkey (those shaded in grey are most likely to be HNV)

* *No HNV farmland*
** *May include some HNV Type 1 and Type 2 farmland*
*** *Predominantly HNV Type 1 farmland*

Table 4.3: Typology of the main forest farming systems in Turkey (those shaded in grey are most likely to be HNV)

	Production System	Main characteristics	Regions	Remarks
Extensive*	Mixed farming	Mixed small scale farms, mixture of crop and livestock production. Farms may have some arable land for the production of forages, fruits, vegetables, cereals, pulses etc. Traditional varieties/ land races are used and a fine-grained mosaic is present. Winter feeding based on hay, straw and concentrates from outside sources. A mixture of local and cross-breed animals.	Farming System is common in all regions. Cattle dominant: Eastern & Black Sea Sheep dominant: Central & Transition Goats dominant: Mediterranean & South East	Around 12 % of agricultural holding
	Livestock farming	Farmers have no arable land, but some natural meadows for hay production for winter feeding. Livestock are grazed on communal grassland in summer and winter feeding based on hay, straw and concentrate. Straw and concentrate is purchased from outside of the farm. A mixture of local and crossbreed animals are reared. Sheep and goat farming is most common.	Farming System is common in all regions. Cattle dominant: Eastern & Black Sea Sheep dominant: Central & Transition Goats dominant: Mediterranean & South East	Around 10% of agricultural holdings
	Traditional mountain pastoralism	Farmers move to seasonal grazing areas (Yayla) and they graze rangeland from May to October . No arable land but some natural meadows for hay production for winter feeding. They live in Yayla with part of their family and produce animal food. Livestock fed in the village in winter time with hay , straw and concentrate produced in village land or purchased . The herd may be comprised with the mixture of cattle sheep and goat. Mixture of local and crossbreeds animals are reared.	Farming System is common in Black Sea, Mediterranean, Transition & Eastern Cattle dominant: Eastern & Black Sea Sheep dominant: Central Goats dominant: Mediterranean & South East	Around 5% of agricultural holdings

* *Predominantly HNV Type 1 and Type 2 farmland*

4.3 Step 2: Mapping HNV Farming Systems in Turkey

The next step involves developing and applying indicators to identify the distribution of HNV farmland.

Maps of HNV farmland have been prepared by some EU Member States and are a potentially useful tool for visualising which parts of a country are likely to be most relevant for targeting measures, such as agri-environment payments, to support HNV farming systems and the preservation of HNV farmland. However, such maps must be interpreted with caution since (Beaufoy, 2008):

- the available data sources for producing HNV maps are usually inadequate and can only indicate i) the **approximate location** of where HNV farmland might be found, and ii) the **approximate area** (hectares) of HNV farmland;
- the biological diversity of farmland ranges along a gradient between the lowest and the highest values and there is **no clear dividing line** that can be drawn on a map between HNV and non-HNV farmland.

Broadly speaking, indicators of HNV farmland can use three different types of criteria:

- Land Cover Criteria
- Farming Practices Criteria
- Species Criteria

These are discussed in more detail in Annex 1. Using this guidance, local experts developed a system for using available data and expert opinion to prepare a preliminary map showing the broad distribution of HNV farmland in Turkey (see Figure 4.2).

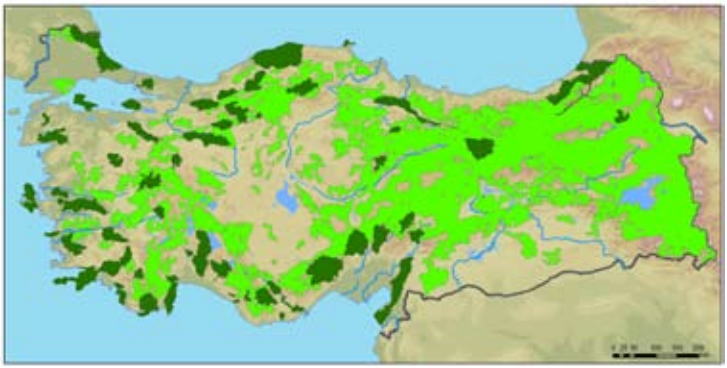
This is NOT a final and definitive map, but a preliminary version using easily available data within a limited time frame. It indicates that 238,849 km2 of agricultural land in Turkey is High Nature Value (HNV). This is equivalent to 58.5% of total agricultural area and 30.6% of the total territory of Turkey (compared to only 5.8% that is designated as a protected area).

The map was developed through 4 stages:

Stage 1: Farming Systems - a baseline map was prepared using data from a land use study available from the Scientific and Technological Research Council of Turkey (TÜBİTAK). From the total area of land identified under agricultural and forestry production, the land under dense irrigation, above 3,000 metres and covered by forest habitats was extracted – this gave the first indication of potential HNV farmland (i.e. unirrigated, unforested farmland below 3,000 metres).

Based upon expert knowledge, it was decided that this baseline map should also include those forest areas which were known to have forest villages with small-scale agriculture. A total of 71 forested Key Biodiversity Areas (KBAs) were therefore added to create the following first draft map:

Stage 2: Key Biodiversity Areas and biodiversity values – after preparing the first draft map, the project experts applied various biodiversity criteria using data from the Key



First draft map of HNV farmland (including forested KBAs in dark green)

Biodiversity Areas database prepared by Doğa Derneği' (see Section 2.2). This is the only available national database for the 8 groups of endangered species (vascular plants, birds, mammals, amphibians, reptiles, butterflies, freshwater fish and dragonflies) groups in Turkey.

There is very little information available on the relationship between agriculture and biodiversity in Turkey, but a list of 14 endangered bird and mammal species were identified in the KBA database whose status is known to be linked to farming practices. These HNV indicator species were:

Species	IUCN Red List Category
Otis tarda	VU (global list)
Grus grus	EN (national list)
Grus virgo	CR (national list)
Tetrax tetrax	CR (national list)
Crex crex	EN (national list)
Circus macrourus	CR (national list)
Falco naumanni	VU (global list)
Aegypius monachus	LC (national list)
Gyps fulvus	LC (national list)
Gypaetus barbatus	VU (national list)
Neophron percnopterus	EN (global list)
Aquila heliaca	VU (global list)
Geronticus eremita	CR (global list)
Gazella subgutturosa	VU (global list)

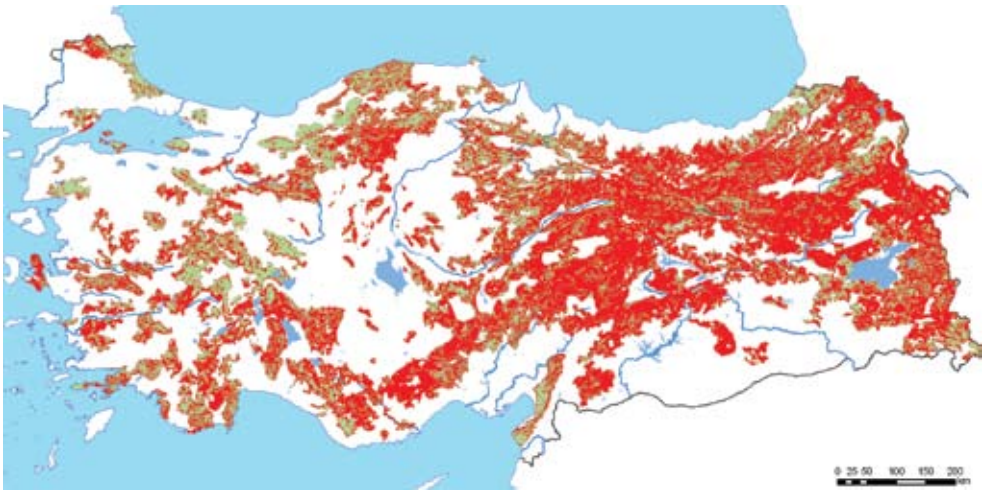
The distribution of each these species was overlapped with a map of agricultural land in order to identify additional areas of HNV farmland that could be added to the first draft map. For example, the distribution of Great Bustard (*Otis tarda*) on agricultural land is marked as yellow on the map opposite:

When the distribution of all these HNV indicator species was mapped then a second draft of the HNV map was produced as follows:

Second draft map of HNV farmland (including HNV indicator species)

Stage 3: Mapping of local breeds of cattle, sheep and goat – the second draft of the map was further enhanced using expert opinion based upon the distribution of important local breeds of cattle, sheep and goats. Data for this was supplied by the MARA General Directorate of Agricultural Research (TAGEM) as follows:

Stage 4: Finalise map using CORINE land cover classification data – the final stage involved the "fine tuning" of the draft HNV map by comparing it with CORINE land cover categories potentially associated with HNV farming systems (see Annex 3).



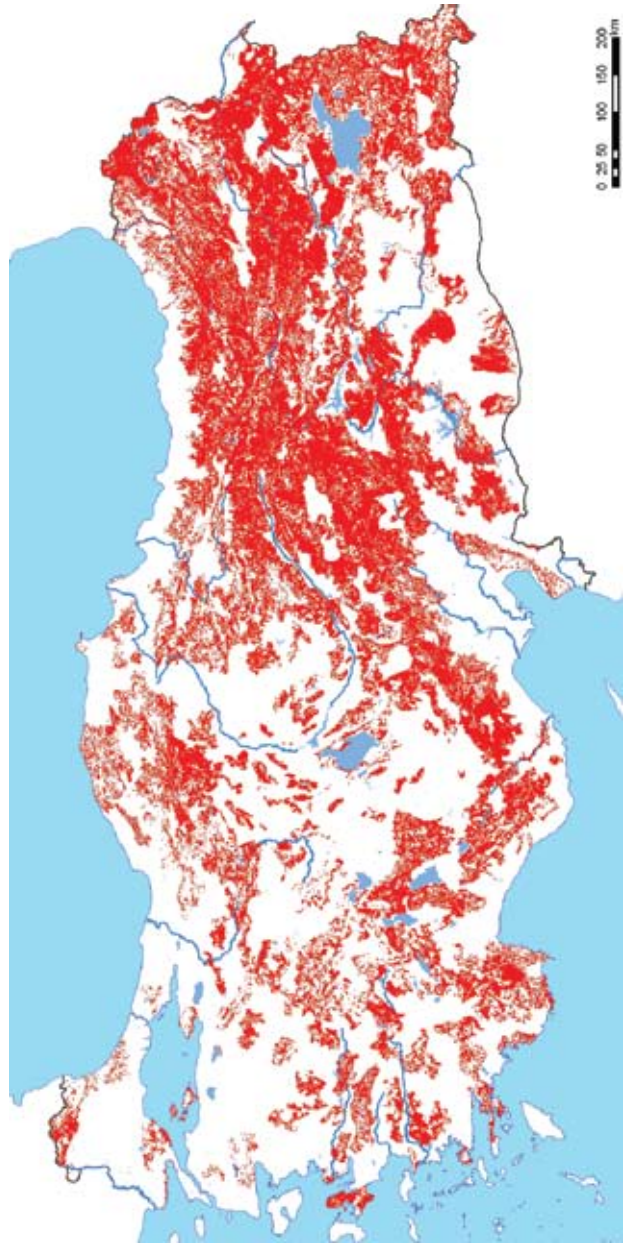


Figure 4.2: Final version of the map indicating the likely distribution of HNV farmland in Turkey

4.4 Step 3: Case Studies to Understand Selected HNV Farming Systems in Turkey

4.4.1 Pınarbaşı, Küre Province, Western Black Sea Region

Background

Pınarbaşı is a hilly district with an average altitude of 650 metres that is located to the south of the Küre Mountains in the Western Black Sea region. Winters are long and cold, and the summers are short and warm. Land use is dominated by coniferous forest (63% of land cover) with semi-natural grasslands (pastures), cultivated land and scrubland occurring at lower altitudes.

The local economy is based upon agriculture, forestry and tourism (particularly eco-tourism). Incomes are low and living conditions are difficult and most young people have migrated to the nearby cities. The remaining population is increasingly old (85% of people are aged 50 or older) and the traditional ways of life are slowly disappearing.

Approximately 50% of all cultivated land is abandoned (especially on the steeper slopes) and used either for rough grazing or allowed to revert to forest. Most of the farmers that remain are not included in the National Farm Registration System and therefore not eligible to receive Direct Income Support (DIS) payments (see section 2.6.2). Consequently there is also no incentive for young people to return to farming.

Local Farming Systems

Farming systems in the Pınarbaşı district can be divided into two types of *forest farming system*:

- *Extensive mixed farming systems* dominated by livestock (cattle and sheep) are associated with the villages in the lowland areas. Most farms (46%) are 20-50 decares (2-5 hectares) in size with a mixture of cultivated land (cereals and fodder crops), fallow land, pasture and some fruit trees. Wheat, barley and vetch are grown commercially, plus lentils and chickpeas for home consumption. Yields are very low, limited by the poor soils, steep slopes, long cold winters and dry summers. Around 20% of cultivated land is irrigated and farmed more intensively, but otherwise the use of agro-chemicals is either very low or non-existent since local farmers cannot afford to purchase them. These mixed farming systems form a mosaic landscape that also includes landscape features such as

stone walls, hedgerows and traditional wooden fences;
- *Extensive livestock farming systems* consisting of seasonal livestock grazing with cattle and no cropping is practiced by those villages at higher altitude which are surrounded completely by forest.

Animal husbandry in both farming systems is characterized by the use of native breeds. Pure bred animals are very uncommon. The numbers of all livestock have declined significantly during the last 20-30 years. This is due to a number of reasons, including the general decline in the local population and abandonment of livestock farming, plus the prohibition of grazing by sheep and goats in the forest villages by the forestry administration. Those animals that do remain are generally grazed for 6 months from May to November, and then housed for 6 months and fed on straw, local fodder crops and purchased feeds. Due to the decline in livestock numbers, most pastures are under-grazed during the summer months and increasingly over-grown with shrubs and in danger of reverting to forest.

Biodiversity of the Area

The Küre Mountains are a place of great beauty and importance for biodiversity, especially due to the variety of endemic forest wildlife, and the region was declared a National Park in 2000 in recognition of its natural and cultural richness. The Pınarbaşı district is in the buffer zone of the National Park and in the southern part of the Küre Mountains Key Biodiversity Area (KBA). The main habitats in the KBA are coniferous forests, including black pine (*Pinus nigra*), scotch pine (*Pinus sylvestris*) and fir (*Abies nordmanniana* spp. *bournmuelleriana*); riverine habitats; traditionally managed farmlands; orchards; forest grassland patches, and; rocky cliffs.

The KBA is mainly important for:
a) birds of prey and temperate zone forest birds, including Bearded Vulture (*Gypaetus barbatus*), Golden Eagle (*Aquila chrysaetos*), Peregrine Falcon (*Falco peregrinus*), White-backed Woodpecker (*Dendrocopos leucotos*) and Semi-collared Flycatcher (*Ficedula semitorquata*), all of which breed in the KBA;
b) mammal species like European lynx (*Lynx lynx*), otter (*Lutra lutra*), European wildcat (*Felis sylvestris*), red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa*), Caucasian squirrel (*Sciurus anomalus*), jackal (*Canis aureus)*, wolf (*Canis lupus*), fox (*Vulpes vulpes*), marbled polecat (V*ormela peregusna*), and brown bear (*Ursus arctos*);
c) a total of 27 vulnerable plant species, including one local endemic (*Ornithogalum kureneaum*).

Relationship of Agriculture and Biodiversity

Whilst local people are mainly concerned about the impact of wildlife upon their crops, notably the damage caused

by wild boar and brown bears, their extensively managed farmland also provides an important habitat for many wildlife species.

Both HNV Type 1 and 2 farmland (see section 3.2) can be identified in Pınarbaşı district. The typical HNV Type 2 mosaic of low intensity cultivated and uncultivated plots, patches of semi-natural vegetation, hedgerows and stonewalls is a particularly important feeding and breeding habitat for birds. A total of 22 bird species with a preference for farmland habitats, including open arable and fallow land, short vegetation, newly ploughed fields, grassland, orchards and cereal fields have been recorded for Pınarbaşı district in KusBank (Turkey's national bird database). Birds of prey found in the area, such as the Bearded Vulture, are also dependent upon farmland for feeding. Although there is no data available, the low use of pesticides and fertilizers will also have benefited many other species of flora and fauna (including invertebrates), and generally contributed to a more diverse and healthy local ecosystem.

The greatest threat to the semi-natural grasslands (HNV Type 1) and mosaic of low intensity farmland (HNV Type 2) is land abandonment. Unfortunately this is already well advanced due to the increasing migration of people from the local villages and a comprehensive set of rural development measures would be needed to stop this.

4.4.2 Beypazarı, Ankara Province, Central Anatolia Region

Background

Beypazarı district is located approximately 100km from Ankara and is typical of the large areas of steppe-type ecosystem that occur in the central Anatolian plain. The average altitude is 675 metres, with parts of the district rising to 2,000 metres. The climate is continental with cold winters (minimum -18°C) and hot, dry summers (+43°C).

Land use is predominantly agricultural (72%) with relatively small areas of forest land (14%). The most common size of farm is 20–50 decares (2-5 hectares). Just under half of the agricultural land is cultivated for cereal crops (wheat and barley), sunflower, fodder (vetch), commercial vegetable production and some small orchards and vineyards for home consumption. The remainder of

the agricultural land is dry grassland (rangeland) used for grazing livestock (mainly sheep and Angora goats).

The local economy is based upon agriculture with approximately two-thirds of all income coming from commercial vegetable production, wheat and barley, and livestock production. Much of this income is concentrated in the south of the district where the more intensive crop production systems are found. Consequently the migration of local people to urban areas is much lower from the south of Beypazarı than from the north of the district.

Local Farming Systems

Agriculture in Beypazarı was historically an extensive mixed farming system with a balance of crop and livestock production capable of sustaining the local community with a range of food and non-food products. However, during the last 30-40 years agricultural production in the district has changed significantly and is now increasingly divided between:

- *Semi-intensive mixed farming systems dominated by crop production* that are found in the dry, highland areas in the north of the district. These systems were introduced in the late 1960s when the increased availability of tractors made the cultivation of marginal, sloping lands possible. Farmers today typically cultivate a 3 year rotation of cereals – sunflower – cereals, whilst grazing their animals on the available rangeland. The grazing season is from early May until late October. Livestock are taken daily to the rangeland, usually by a hired shepherd (although these are increasingly difficult to employ). Over-grazing due to poor management of the grazing animals (rather than excessive livestock numbers) is a potential problem. Although the numbers of cattle, sheep and goats are declining, livestock production is still relatively viable because of the closeness of Ankara and the large market for livestock products it provides;
- I*ntensive/Semi-intensive crop production systems* that are found in the lower altitude plain areas in the south of the district. This includes some dryland cereal production, but also vegetable production on irrigated land - mainly carrots (about 48% of all carrot production in Turkey is in Beypazarı), lettuce and tomatoes. Up to 3 vegetable crops per year can be grown and increasing amounts of pesticides and fertilizer are applied to the modern, high yielding varieties that are used (consequently, many local native varieties have been lost). Cereals and intensive vegetable production have now almost completed replaced the mixed farming systems that used to exist in the lowland plain areas and livestock production is no longer practiced.

Biodiversity of the Area

Beypazarı district overlaps with two adjacent Key Biodiversity Areas (KBAs) – the Sarıyar Dam KBA and the Nallıhan

Hills KBA. The main habitats around the Sanyar Dam Lake are riverine vegetation, wetlands, grasslands, cultivated land and the Kirmir River Delta. These are all valuable habitats for the breeding, feeding and over-wintering of many water birds and birds of prey. The area is particularly important for species such white stork (*Ciconia ciconia*), black stork (*Ciconia nigra*), Egyptian vulture (*Neophron percnopterus*), night heron (*Nycticorax nycticorax*), Lanner falcon (*Falco biarmicus*), peregrine falcon (*Falco peregrinus*) and black kite (*Milvus migrans*). The area also hosts 2 pairs of breeding white-tailed eagle (*Haliaeetus albicilla*) from a total of at most 10 pairs in Turkey.

The main habitat types in the Nallıhan Hills KBA are forest, riverine forest, farmlands and steppic vegetation. The KBA is very important for 4 endemic plant species: *Alyssum niveum*, *Astragalus trichostigma*, *Muscari adilii* and *Asyneuma linifolium* spp. *nallihanicum*. It is also the feeding area of threatened vulture species like black vulture (*Aegypius monachus*), Egyptian vulture (*Neophron percnopterus*), and Bearded vulture (*Gypaetus barbatus*). The area also hosts a red deer (*Cervus elaphus*) population.

Relationship of Agriculture and Biodiversity

As in the Küre Mountains, local people in Beypazarı are mainly concerned about the negative impact of wildlife upon their crops. The biggest problem is the damage caused to growing crops by wild boar and there are efforts by the Ministry of Agriculture and Rural Affairs (MoARA) and Ministry of Environment and Forestry (MoEF) to prevent these damages by allowing hunting upon request and permission. Crop damage by red deer is also an increasing problem.

Both HNV Type 1 and 2 farmland can be identified in Beypazarı district, but both types have been in decline for the last 30-40 years due to the changing patterns and intensity of agricultural production. Rangeland vegetation (HNV Type 1) in the highlands has always been cultivated by local people for cereal production, often by exploiting small parcels of land for a few years and then moving on to another parcel when the fertility is depleted. However, the area of cultivated land increased significantly in the late 1960s and undoubtedly led to the loss of much biodiversity associated with the rangeland's steppic ecosystem. Although the loss of rangeland by ploughing and cultivation has now declined, some localised over-grazing of rangeland vegetation continues to be a potential problem.

The original mixed cropping systems of the district created a characteristic HNV Type 2 mosaic of low intensity cultivated and uncultivated plots, patches of semi-natural vegetation, and traditional field/parcel boundaries that supported an abundance of wildlife species. This mosiac has been greatly

modified due to the simplification of crop rotations throughout the district and the introduction of intensive vegetable production in the lowland plain. Nonetheless, a total of 40 bird species with a preference for farmland habitats have still been recorded in KusBank for Beypazarı district, notably those species with a preference for open arable and fallow land or short vegetation. This includes both birds of prey, such as the Common Kestrel (*Falco tinnunculus*), and small seed-eaters, such as the Wheatear (*Oenanthe oenanthe*).

4.4.3 Zara, Sivas Province, Central Anatolia Region

Background

Zara County is a highland region in Central Anatolia with an average altitude of 1,350 - 2,000 metres. Winters are very cold (minimum -35°C) with heavy snow and summers are warm (maximum +25°C) and dry. Land use is mainly agricultural consisting of 51% grasslands (mainly semi-natural rangeland vegetation) used for common grazing, 33% cultivated land and 16% forestry. Only a small proportion of the land (3.5%) is irrigated.

Crop production and livestock are the main sources of income, supplemented by bee-keeping and Direct Income Support (DIS) payments. Indeed, the number of holdings and agricultural land registered in the Farm Registry System for Zara County more than doubled between 2001 and 2005 due to farmers cultivating as much land as possible in order to benefit from the DIS payments. Over 75% of all agricultural land in Zara County is now registered for DIS payments. Some farmers have even returned to the villages to benefit from the support, but overall this has still done little to address the migration of young people from the local villages to urban areas. This is one of the most important problems for Zara County and in the last 30 years the local population has declined by over 40%. This inevitably threatens the future viability of local agriculture.

Local Farming Systems

Agriculture in Zara County mainly consists of semi-intensive mixed farming systems that integrate cattle and sheep with wheat, barley and forage (lucerne and vetch) production, plus bee-keeping. Relatively few vegetables and fruits are grown.

Each local family has 6-7 cattle which from May - November are taken every

day to the rangelands for common grazing. Only a few families have sheep and goats. The majority (70%) of animals are native breeds, but the number of cross-breeds is increasing steadily. Until recently the total number of animals was decreasing (especially sheep which decreased enormously in numbers during the last 20-30 years), but there has been a slight increase in cattle numbers during the last 2-3 years due to government support for forage crops (see below). Over-grazing is not a problem and no rotational grazing is practiced.

Cereals occupy 50% of the cultivated land and are grown in a 3 year rotation with fallow (40% of cultivated area) or vetch. Wheat and barley are grown for sale, whilst oats, rye, chickpeas and lentils are grown for home consumption. Vetch and lucerne are grown for animal fodder. In recent years the area of lucerne has increased greatly due to an additional DIS payment per decare for growing forage crops. This was intended to promote local livestock breeding and has been partially successful, but it has also distorted cropping patterns hugely in some villages with lucerne replacing wheat as the main crop being grown. Fertiliser use is relatively low in Zara County and mainly limited to wheat and barley, plus the later years of lucerne production (lucerne crops have a life of 7-8 years in Zara County).

Bee-keeping is an important source of income and Zara County is one of the most important bee-keeping regions in Turkey because of the floral diversity of the local pastures, notably *Thymus*, *Astragulus*, *Trifolium* and *Verbascum* species. An average of 3-4 families in every village have hives and around 50 tonnes of honey is produced in the region per year with the geographic indication of “Zara Balı”.

Biodiversity of the Area

Zara County is located in the southern part of the Kösedağ Key Biodiversity Area. The main habitats of the KBA are scotch pine, black pine forests, oak forests, orchards, alpine meadows, agriculture land and riparian forest. The KBA is the only place on earth where five endemic plant species (*Stachys sivasica*, *Verbascum pallidiflorum*, *Geranium chelikii*, *Scrophularia serratifolia* and *Reaumuria sivasica*) are found. There are also vulnerable species of reptile and butterfly in the KBA, plus it is an important breeding area for a number birds of prey, including the Booted Eagle (*Hieraaetus pennatus*), Eygptian Vulture (*Neophron percnopterus*), Common Buzzard (*Buteo buteo*), Long-legged Buzzard (*Buteo ruffinus*) and Common Kestrel (*Falco tinnunculus*) – all of which have a preference for hunting on open farmland.

Relationship of Agriculture and Biodiversity

Again, the main issue of concern to local people is the increasing crop damage caused by wild boars and brown bears. This is a particular problem for crops,

such as wheat, which are grown for sale. According to local villagers, the population of both species appear to have increased in recent years and consequently there are some efforts to introduce controlled hunting licences for the wild boar, plus damage prevention techniques (such as bee hive platforms and electric fences) for the brown bear.

Both HNV Type 1 and 2 can be observed in Zara County and the overall agricultural landscape is enhanced greatly by the traditional practice of using a variety of boundary types (hedgerows and stonewalls) to divide fields and parcels in different ownership.

The rangeland vegetation (HNV Type 1) and relatively large areas of fallow crop land are undoubtedly important feeding and breeding areas for many birds and a total of 69 species with a preference for farmland habitats are recorded in Kusbank for Zara County. This includes the large populations of Red-billed Chough (*Pyrrhocorax pyrrhocorax*) found breeding in the area. The Red-billed Chough is a commonly used indicator of HNV farmland since it feeds predominantly on invertebrates that live on the soil surface, especially those associated with animal dung left by grazing animals. The preferred feeding areas for Red-billed Choughs are therefore grasslands of various types (including old pastures and areas of cropland used for grazing), plus some arable fields for supplementary feeding in the autumn and winter.

However, the quality of the HNV Type 2 (low intensity cropland mosaic) is questionable because of the changing patterns of crop production observed, particularly the specialization in lucerne encouraged by the DIS payment scheme.

4.4.4 General Characteristics of the HNV Case Studies

The three case studies outlined above highlight a number of general characteristics of HNV farmland in Turkey. Both HNV Type 1 (predominantly semi-natural vegetation) and Type 2 (low intensity cropland mosaic) exist in the case study areas. However much HNV farmland has clearly already been lost and that which remains is subject to a number of contrasting pressures with a range of positive and negative impacts upon biodiversity.

A common issue found in all of the case study areas is the depopulation of villages due to the migration of young people to urban areas. The resulting reduction in the number of farmers and agricultural workforce is currently leading to:

- the increased use of fallow in arable crop rotations – this is potentially positive for biodiversity by providing nesting sites for ground-nesting birds, increasing invertebrate populations and providing habitats for small mammals;
- reduced grazing pressure on the rangeland (due to less animals being kept) – this is potentially both negative and positive for biodiversity

depending upon the original intensity of grazing and whether an extensive grazing system is being re-established, maintained or lost;
- the conversion of marginal arable land (i.e. that which is difficult to cultivate) back to semi-natural habitat and grazing land – this is potentially positive for biodiversity, especially where the grazing land is extensively managed and/or patches of scrubland are created alongside low intensity cropland. Patches of diverse scrubland provide nectar, seeds and fruits, shelter and nesting sites for invertebrates, birds and mammals, as well as a suitable habitat for many flowering plants;
- the on-going abandonment agricultural land – this is potentially negative for biodiversity in the long-term, especially where open rangeland and low intensity cropland is reverting back to forest.

At the same time, in certain areas and under certain circumstances, HNV farmland is under pressure from the intensification of production. For example:
- although total numbers of livestock are much reduced there are still problems of over-grazing due to the poor management of grazing animals on rangeland close to the villages – this is potentially negative for biodiversity, especially where the rangeland vegetation is species rich;
- much rangeland was lost in the past due to it being ploughed for arable crop production. Although this practice is now much reduced, there are still examples of it occurring – this is potentially negative for biodiversity, especially where the rangeland vegetation is species rich;
- low intensity mixed farming systems in some areas, especially those with more fertile soils and available water supplies for irrigation, are being replaced by more intensive crop production systems. These changes in cropping pattern are stimulated both by market conditions (e.g. the increase in commercial vegetable production in Beypazarı district) and also by government policy (e.g. DIS support payments for forage crops in Zara County) – this is potentially negative for biodiversity due to the loss of traditional mixed farming systems, loss of semi-natural habitats and the increased use of agro-chemicals;
- some other low intensity cropping systems are being intensified by irrigation from deep (often illegal) wells and boreholes – this is negative for biodiversity due to the increased use of agro-chemicals and long-term impact upon local water resources;
- there is a gradual decrease in the use of native farm breeds and crop varieties/land races since these are less productive and not suited to more intensive production systems – this is negative for biodiversity because of the loss of agricultural genetic diversity.

Section 5

Agri-environment Policy-making in Europe

5.1 What are Agri-environment Policies?

Agri-environment policies are government policies that are designed to encourage farmers to protect and enhance the natural environment on the land that they manage. This includes the protection and conservation of soil, ground and surface water, wildlife habitats and species, traditional agricultural landscapes and air.

Agri-environment policies do not use regulations to restrict the activities of farmers (although regulations clearly have a role to play in environmental protection), but instead offer payments to farmers in return for providing an "environmental management service" by maintaining or modifying their day-to-day management practices in order to produce a specific environmental benefit.

Agri-environment payments are not a typical subsidy or form of income support payment. Farmers must work to produce an environmental benefit and are then compensated for the costs that they have incurred, including any loss of income due to loss of production.

For example, some agricultural management practices which create environmental benefits and could be encouraged by agri-environment payments include:

PRACTICE: Introduce or continue with certified organic farming methods	→	**BENEFIT:** Increased biodiversity and reduced agricultural pollution
PRACTICE: Substantially reduce the use of fertilisers and/or pesticides	→	**BENEFIT:** Reduced agricultural pollution and increased biodiversity
PRACTICE: Convert intensively-managed arable land into permanent grassland	→	**BENEFIT:** Reduced soil erosion and agricultural pollution, plus increase biodiversity
PRACTICE: Keep and breed local breeds of farm animal in danger of extinction	→	**BENEFIT:** Conservation of genetic diversity
PRACTICE: Reduction in the volume of irrigation water consumed	→	**BENEFIT:** More sustainable water usage and reduced risk of salinisation

Agri-environment payments are usually offered to farmers within the framework of a "**measure**" which forms part of a "**scheme**" or "**programme**". In order to receive the agri-environment payment, farmers must sign a "**management agreement**" or contract with the government authority responsible for administration of the overall agri-environment scheme or programme.

This contract will usually specify:
a) the "**management requirements**" that must be followed by the farmer;
b) the specific **areas of land** that the management requirements must be applied to;
c) the **period of time** that the management requirements must be followed for (i.e. the duration of the contract);
d) the **payment** that will be made to the farmer in return for following the management requirements, and;
e) the **penalties** that will be applied if the management requirements are not followed.

Agri-environment schemes or programmes may be designed at national, regional or local level. This means that measures and payments can be adapted to the characteristics of particular farming systems and environmental conditions which makes them a very useful tool for influencing the behaviour of farmers and for achieving a wide range of environmental objectives.

The measures that may be included in an agri-environment scheme or programme are very diverse, but generally speaking have one of two broad aims – either to:

- stop or avoid negative impacts on the environment by discouraging bad practices, or;
- maintain or create positive impacts on the environment by encouraging good practices.

It is currently mandatory for all EU Member States to offer agri-environment payments to farmers, although the participation of the farmers is voluntary.

Agri-environment payments are also available in many non-EU countries. This includes Turkey where a pilot agri-environment scheme (ÇATAK) exists within the framework of the Agricultural Reform Implementation Project (ARIP) (sections 2.6.2 and 6.3), plus a support scheme for organic farming.

5.2 History of Agri-environment Policy-making in the European Union (EU)

Agri-environment payments were first offered to farmers in a few EU Member States (including Great Britain and the Netherlands) during the early 1980s. At this time the agri-environment schemes in operation were national initiatives introduced as pilot schemes in response to the increasing environmental problems associated with the growth of intensive agriculture and the need to maintain, improve and sometimes create wildlife habitats and traditional landscapes associated with agricultural

land.

Agri-environment payments first became part of the Common Agricultural Policy (CAP) in 1985, but remained optional for EU Member States to adopt. In 1992 it became compulsory for all EU Member States to develop agri-environment schemes and to offer agri-environment payments to farmers – although the participation of farmers was voluntary.

Monitoring and evaluation of agri-environment payment schemes in EU Member States during the 1990s showed that they led to significant benefits for the conservation of valuable semi-natural habitats, biodiversity, landscape, water and soil resources (EC, 1998).

It was also concluded from the socio-economic evaluation of the schemes that "...agri-environment payments can be expected in certain circumstances to be the determining factor that enables a farmer to stay in business when he or she would otherwise have left farming". This beneficial effect of the increased income from agri-environmental payments was most noticeable in marginal areas.

Since 1999, agri-environment payments have been incorporated into EU rural development policy (see Box 5.1) and now form an obligatory part of the European Agricultural Fund for Rural Development (EAFRD) which includes a wide variety of measures which address a range of environmental, social and economic issues in rural areas. Agri-environment payments are financed under Priority Axis 2 of the EAFRD together with a range of other payments supporting the sustainable management of agricultural and forestry land.

The inclusion of agri-environment payments in rural development policy is a very significant development in EU policy-making since it recognizes that:
1. agriculture is a "multi-functional activity" that delivers a range of "goods" and "services" to society in addition to the production of food and fibre, and;
2. agri-environmental payments provide both environmental and socio-economic benefits and should be supported within the framework of an integrated rural development policy.

The total amount of public money spent on agri-environment schemes in the EU has increased rapidly since the early 1990s. For example, Figure 5.1 shows the evolution of total actual EU spending on agri-environment payments from 1993 to 2006, together with the total EU funds allocated to agri-environment measures for the period of 2007-2013.

Almost one quarter of all farmland in the EU has been included in an agri-environment scheme, although this figure varies greatly between Member States (see Figure 5.2).

Box 5.1: Brief History of Rural Development Policy in the European Union (EU)

The EU Common Agricultural Policy (CAP) was first established in 1962 with the strategic objective of food security after the 2nd World War. For the next 30-40 years it was a major driving force for agriculture in western Europe encouraging the expansion, specialisation and intensification of agricultural production.

The CAP was significantly reformed in 1999 and existing rural development measures (including agri-environment payments) were brought together to form the so-called second "pillar" of the CAP with approximately 10% of the total budget for the period 2000-2006. The Rural Development Regulation No. 1257/1999 that defined the new Pillar II of the CAP established 5 key objectives for rural development, including for the first time "to encourage the promotion of environmentally-friendly agriculture".

The process of CAP reform continued in 2005 with the establishment of the European Agricultural Fund for Rural Development (EAFRD) which committed approximately 24% of the total CAP budget to rural development. According to the EAFRD Regulation No. 1698/2005, rural development in EU Member States should be supported according to four priorities:

Priority Axis 1 - Competitiveness of Agriculture and Forestry
Priority Axis 2 - Sustainable Land Management – including agri-environment payments
Priority Axis 3 - Rural Diversification and Quality of Life
LEADER - Area-based, bottom-up, local partnership

In order to guide this process, the European Commission created for the first time an EU strategy document for rural development - the so-called Community Strategic Guidelines (CSG) for Rural Development - that was intended to guide Member States whilst developing their rural development programmes and ensure they are both focused upon EU priorities and complementary to other EU policies.

Each Member State has then been obliged to prepare a National Strategy Plan (NSP) for Rural Development (2007-2013) in order to "translate" the EU priorities according to the national situation and context. This is intended to ensure that Community aid for rural development is a) spent consistently within the framework of the EU strategy document and b) that Community, national and regional priorities are co-ordinated.

Environmental protection and sustainable development are very important objectives for rural development under Priority Axis 2.

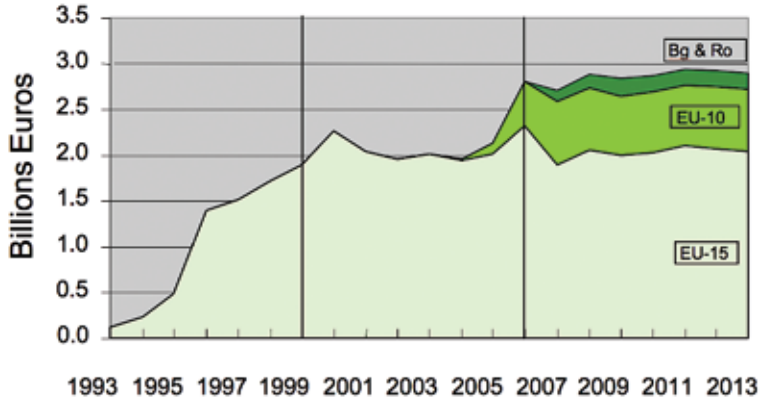


Figure 5.1: Evolution of EU expenditure (Billions Euros) on agri-environment payments – including actual expenditure from 1993-2006, plus funds from 2007-2013 (prepared by IEEP from various data sources). National co-financing and additional national financing is not included.

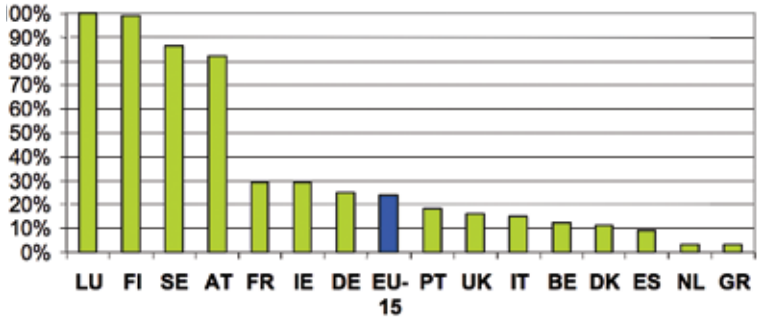


Figure 5.2: Share of Utilisable Agricultural Area included in an agri-environment scheme in 2002 (under Regulations 2078/92 and 1257/99). Data currently only available for the EU-15 Member States. Source: EC (2005).

5.3 Basic Principles of Agri-environment Policy-making in the European Union (EU)

Agri-environment payments are an obligatory part of EU rural development policy and must therefore be implemented in all EU Member States. The payments offered to farmers are partly financed by the EU budget and partly by the national budget of the Member State. The amount of co-financing provided from the EU budget is 85% in the so-called "Convergence Areas" (including all new Member States) and 60% in others.

Member States may additionally finance their own national agri-environment schemes with 100% national funding.

All agri-environment programmes and schemes which are developed by Member States for EU co-financing must be approved by the European Commission and must follow certain basic principles. Some of these principles apply to the structure for establishing and implementing the payment schemes, whilst others concern the agreements that are made with farmers.

These principles are summarized below:

1. The primary objective of any agri-environment payment scheme must be environmental. In particular, payment schemes should contribute to achieving the EU's policy objectives with respect to agriculture and the environment. Member States must therefore consider the following EU priorities:
   - biodiversity and the preservation of high nature value (HNV) farming systems – see Section 3;
   - sustainable water management, and;
   - combating climate change.

2. Participation in agri-environment payment schemes is **voluntary** for farmers. Experience suggests that in order to ensure a high level of interest and uptake by farmers it is essential to develop schemes which are clear and simple to understand.

The agri-environment practices that have to be followed by the farmer must be clearly described and their **environmental** benefits should be explained. The farmer must clearly understand the different components of the measure and the practical actions that must be taken, as well as the payment that will be received for these actions.

3. Agri-environment payments should be offered to farmers for a **minimum of 5 years.** In some cases longer periods may be appropriate.

4. Agri-environment payments can only be made for actions that go beyond certain **minimum (baseline) requirements**. This is to ensure that farmers receiving agri-environment payments create greater environmental benefits than they would by simply complying with environmental legislation and codes of good agricultural practice.

In EU Member States this baseline includes the 'cross compliance' rules that farmers need to meet in order to receive all of his or her CAP subsidy payment.

5. Agri-environment payments in the EU are not a form of income support – neither are they for supporting investments. Payments are made on an annual basis per hectare (or livestock unit) to **compensate** the farmer for a) the loss of income and b) any additional costs caused by adopting more environmentally-friendly farming practices.

Since agri-environmental payments must compete economically with other forms of profitable land use, **payment levels** have to be set sufficiently high to attract farmers to join schemes while avoiding over-compensation of farmers. This requires the careful calculation of appropriate payment levels by Member States using the best available data.

6. Maximum levels of EU co-financed agri-environment support are currently (2007-2013) limited to:
1. 600 EUR per hectare for annual crops
2. 950 EUR per hectare for specialized perennial crops
3. 450 EUR per hectare for other land uses
4. 200 EUR per livestock unit for endangered breeds of farm animal

7. All agri-environment management requirements must be **verifiable**. Member States must avoid designing agri-environment measures and actions which cannot be controlled by methods such as the verification of documents, on-the-spot field checks and sampling for laboratory analysis.

8. Agri-environment schemes are very flexible and adaptable. Member States are therefore expected to design agri-environment measures, schemes and programmes which are most **appropriate to their national context**. For example, they may adopt payment schemes (or combinations of schemes) which are:
- Local and site specific e.g. for habitat/ species conservation
- Regional e.g. for erosion control
- National e.g. for organic farming

Local and regional schemes which are restricted to certain areas are called "zonal" schemes. National schemes which are applied in the entire territory of a country are called "horizontal" schemes.

5.4 Lessons to be Learnt from EU Member States

Agri-environment schemes have been applied in Europe for long enough now to be able to learn a lot of important lessons about their design and implementation. Experience and evidence from the EU Member States shows that agri-environment schemes can deliver positive environmental outcomes – but they must be well-designed.

A number of important keys to

success design have been identified (Birdlife, 2005; Brunner, 2007):
1. Agri-environment schemes are paid for by tax-payers and should be used to reward the delivery of benefits to the public, including clearly defined environmental “goods” and “services”.

2. Schemes must be financed by a sufficient budget to deliver their aims.

3. The design of schemes must be based on good science. Agri-environment schemes attempt to deliver environmental gain through introducing changes in agricultural land management. Ensuring environmental benefits are created requires a clear understanding of the relationship between land management and the environment.

4. The management requirements of schemes must be simple, feasible and practical for farmers to implement. Where the management required by the scheme is not simple enough to be self-explanatory, then advisory support must be provided for farmers.

5. Schemes should be continuously improved and adapted as situations change, experience is gained and knowledge develops.

6. Schemes must be targeted at the right environmental priorities, areas, habitats, species etc.

7. The impact of schemes must be effectively monitored and the results fed into further stages of scheme design.

8. Stakeholders, including farmers and environmental experts, should be consulted and involved throughout all stages of scheme design and implementation. This can significantly improve the acceptability of schemes to farmers and greatly enhance the uptake and delivery of measures.

9. Schemes must be effectively promoted to farmers and supported with appropriate advisory services

5.5 Importance of the Multi-stakeholder Process

Experience from the EU Member States, especially the new Member States that have recently joined the European Union, is that successful agri-environment programmes are not achieved by small teams of officials working in isolation. The development and implementation of successful programmes requires the involvement of a range of individuals

and organisations with different insights and experiences. These individuals or organisations with an interest and expertise in agri-environment issues are key "stakeholders" in the process of programme design and implementation, and incorporating their combined knowledge and expertise should lead to more coherent and effective agri-environment programmes, schemes and measures.

Farming organisations, national park authorities, research groups, regional administrations are all stakeholders, and their involvement in the process can take a variety of forms, depending on who they are and what expertise they have. They can be invited to be part of an Agri-environment Working Group, responsible for taking a lead in the development of the national programme; they can be involved in the design of regional schemes; or they can participate as data collectors for the on-going monitoring and evaluation of measures. However, a key point is that irrespective of the nature of their involvement, they should be engaged from the start. This is so they feel that they have a share in, and ownership of, the process, and to develop trust and mutual understanding between all partners. If groups feel excluded, there can be a rapid loss of support for the programme, which will make implementation very difficult.

Section 6

Developing a National Agri-environmental Programme for Turkey

6.1 Rural Development Policy-making in Turkey

Over the years there have been a great number of projects and other initiatives implemented in Turkey for supporting the development of rural areas with funding from the national budget and/or international donors.

Until recently, however, there was no specific rural development policy for guiding these initiatives. Instead the main framework for rural development was provided by a series of national development plans under the co-ordination of the State Planning Organisation (SPO) that address the social and economic development of the Turkish Republic as a whole. The two most relevant national development plans currently influencing rural areas are:

- **The 9th Development Plan (2007-2013)** – this includes priorities for rural development under the Strategic Objective of "Ensuring Regional Development", and;
- **The Agriculture Strategy Paper (2006-2010)** – this identifies the main agricultural support instruments to be implemented from 2006-2010 and dedicates 10% of the agricultural support budget to rural development grants and 5% to environmental support (MoARA, 2006a).

With preparation for EU accession, a more strategic sectoral approach to rural development is in the process of being adopted with the preparation of a single National Rural Development Strategy (NRDS) 2007-2013 that was approved by the High Planning Council in January 2006 (MoARA, 2006b).

The NRDS is an important and progressive document that promotes for the first time a more integrated and holistic approach to rural development in Turkey by bringing together:
i) the existing wider strategic framework for agricultural and rural policies that is laid down in the national reference documents listed above, and;
ii) the strategic approach and regulatory framework for rural development adopted by the EU under Pillar II of the Common Agricultural Policy (CAP) for the period 2007 – 2013.

The primary objective of the NRDS is to "*…improve and ensure sustainability of living and job conditions of rural communities in their territory…..by utilizing local resources and potential, and protecting the environmental and*

cultural assets in line with Turkey's long-term development perspective".

In common with other policy documents (see Section 2.6), the NRDS identifies soil erosion and water resource management as the two main environmental problems associated with Turkish agriculture and provides a clear strategic framework for promoting more sustainable farming practices.

Strategic Objective 4 of the NRDS is the Protection and Improvement of the Rural Environment. There are three priorities identified under this Strategic Objective, including Priority 4.1: Improvement of Environmentally-Friendly Agricultural Practices.

The basic objective of Priority 4.1 is to "…develop agricultural activities with environmental protection measures, protect and develop agricultural land and pastures under risk, and spread agricultural production planning suitable for the local ecology".

In accordance with the EU strategic approach, the NRDS also establishes the basis for a "National Rural Development Plan" (NRDP). This document is currently (November 2008) under preparation, and will provide a framework for all relevant stakeholders in preparing and implementing rural development programmes and projects that are financed with both national and international funds.

One important source of international financial support for rural development in Turkey is the European Union (EU) and this will increase in the coming years.

Accession negotiations between Turkey and the EU started in October 2005. In order to assist with the orientation of Turkish businesses and institutions towards the EU there is financial support provided by the EU under the "Instrument of Pre-Accession Assistance" – the IPA Regulation (EC, 2006).

There are five main components to the IPA Regulation, including Rural Development. The main aim of the Rural Development component (commonly referred to as the IPARD programme) is to contribute to the sustainable adaptation of the agricultural sector and rural areas in preparation for the implementation of the Common Agricultural Policy (CAP) and related policies.

The priorities for implementation of the IPARD Programme for 2007-2013 are established in the Multi-annual Indicative Programming Document (MIPD) agreed between the European Union and the Turkish Government. MIPD has the dual function of:

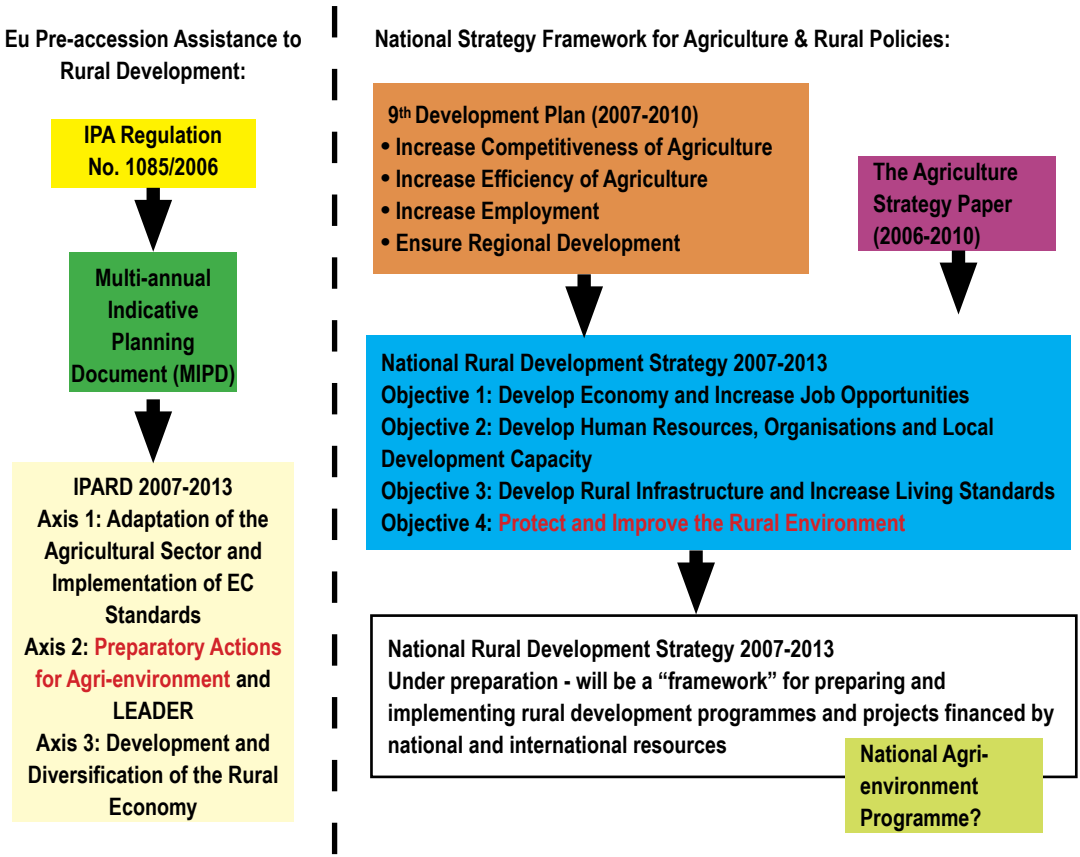
a. preparing the Turkish agri-food sectors to meet EU requirements, and;
b. helping Turkey prepare for the implementation and management of the EU Common Agricultural Policy (CAP) and other related policies.

The IPARD Programme is an important part of the National Rural Development Strategy (NRDS), but will only address a limited number of rural development objectives using the available pre-accession funding.

Priority Axis 2 of the IPARD Programme includes provision for so-called "preparatory actions" for the implementation of pilot agri-environmental measures and local rural development strategies. These measures will not be implemented immediately in Turkey, but will be postponed until the second phase of IPARD from 2010-2013 in order to allow sufficient capacity-building amongst policy-makers, administrative staff etc.

The overall framework for rural development strategy and policy-making in Turkey is summarised in Figure 6.1 below.

Figure 6.1: Summary of the overall framework for rural development strategy and policy-making in Turkey



6.2 Recommendations for a National Agri-environment Programme

As already noted in Section 2.6, good progress has already been made with the integration of environmental concerns into Turkish agricultural policy and there are a number of existing agri-environment-type initiatives for promoting more environmentally-friendly farming. However, significant improvements could still be made by:

a. bringing existing agri-environment initiatives together within a single common administrative framework, starting with the encouragement of better awareness and communication between the ministerial departments responsible for different initiatives,

b. expanding the range of environmental priorities to also include biodiversity conservation in addition to the existing priorities of soil erosion control and water resource management;

c. enhancing the existing agri-environment initiatives to ensure more effective use of available resources, including more efficient administrative procedures.

It is therefore recommended to establish a **National Agri-environment Programme (NAEP)** for Turkey that will form a key part of the National Rural Development Plan 2007-2013 and will deliver Priority 4.1: Improvement of Environmentally-Friendly Agricultural Practices.

The National Agri-environment Programme (NAEP) for Turkey should:

1. **Integrate** the following existing initiatives related to the promotion of more environmentally-friendly agriculture:
   - ÇATAK environmental management programme – due to be expanded to a national scheme from 2009;
   - Organic Farming Direct Income Support (DIS) payments;
   - IPARD Preparatory Actions for Agri-environment.
2. Be **designed** with:
   - A clear "intervention logic" (preferably compatible with the EU intervention logic in Figure 6.2);
   - A dedicated co-ordination unit in the Ministry of Agriculture and Rural Affairs (MoARA);
   - A common payment system (i.e. a single Paying Agency), and;
   - A common framework for monitoring and evaluation.

3. Have a comprehensive set of **general objectives** relating to the following priority issues:
   - Control of soil erosion;
   - More efficient use of water resources;
   - Biodiversity conservation and the maintenance of High Nature Value (HNV) farmland;
   - Expansion of organic farming.

4. Have a **clearly defined "baseline"** relating to relevant legislation, notably the 1998 Rangeland Act and the development of cross-compliance standards by MoARA. Farmers will only be compensated for actions that go

beyond/above this baseline.

5. Be **linked to a permanent Agri-environment Working Group** in order to encourage greater communication and co-ordination on all agri-environment issues relating to the NAEP.

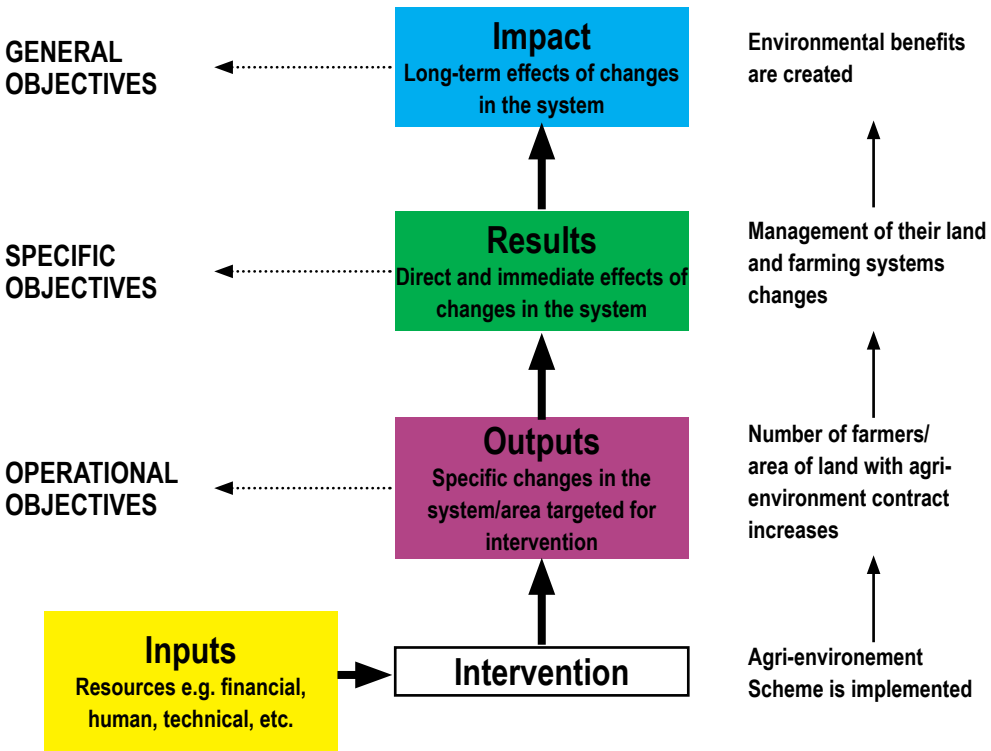
The **agri-environment initiatives included within the NAEP should be enhanced** as follows:

1. The existing pilot ÇATAK project should be expanded as a national scheme and fully utilise the available national agricultural support budget (5% of the 2009 budget is committed to the expansion of the ÇATAK programe);

2. Combine existing measures to develop a single Organic Farming Support Scheme with:

- Conversion and on-going maintenance payments
- Clear menu of payments for different crops
- Additional standards to prevent the risk of environmental damage;

Figure 6.2: EU Intervention Logic for Agri-environment Support Payments



3. Make full and effective use of EU pre-accession funding (IPARD pilot projects) for:

- Developing practical experience at administrative and farm level of the EU approach to agri-environment measures
- Piloting new agri-environment measures, especially to support HNV farming. IPARD should be used specifically to further develop and promote the concept of High Nature Value (HNV) farming as a tool for targeting biodiversity conservation on agricultural land.

Although well designed agri-environment schemes can produce clear environmental benefits, it is essential that the initiatives included in the NAEP for Turkey are not developed and implemented in isolation from other policy measures. Agri-environment payments should be seen as part of an integrated package of measures that work together to promote the sustainability of rural areas for the benefit of both the environment and rural communities.

Further points to note when designing and implementing the NAEP are therefore:

1. Formulate a clear communication strategy for the promotion of agri-environment measures to farmers and ensure that there are adequate resources for promotional materials, information days, media advertising etc. This is particularly important when introducing agri-environment measures for the first time;

2. Ensure that all advisors and technical staff (e.g. regional Paying Agency staff) who are in direct contact with farmers receive on-going training on the agri-environment measures, including feedback on implementation issues. Develop a culture of "learning by doing" and the open exchange of information and experience amongst policy-makers and administrators;

3. Provide adequate funding for advisory and extension services to support farmers throughout the full period of their participation in an agri-environment scheme, including the initial selection of measures and completion of application forms;

4. Training should be included as an obligatory requirement for farmers either before or after entry into an agri-environment scheme and can significantly improve compliance with management requirements, as well as raising general environmental awareness;

5. Complementarity with other rural development measures should be encouraged. For example, encourage development of the market for products from agri-environment measures (e.g. organic and HNV) with strategic support and investment. Other rural development measures which can be targeted at the support of HNV and organic farming systems include:

- Investment in farm modernization, including manure stores and spreading equipment;
- Participation in food quality schemes and the promotion of products in food quality schemes;
- Establishment of producer groups with the objective of adapting to market requirements;
- Investment in small-scale food processing facilities;
- "Non-productive" investments in environmental management, such as clearing scrub from unused land, improving facilities for grazing livestock and shepherds, creation of farmland features to benefit specific features;
- Diversification into non-agricultural activities (e.g. green tourism) and setting-up micro-businesses.

6.3 ÇATAK Programme

The ÇATAK programme has the potential to become an important component of Turkey's future National Agri-environment Programme. Payments from the programme are currently offered to farmers in the pilot areas as follows:

CATEGORY I:

Erosion combat, improvement of the land and ordinary agricultural practices or land abandonment aiming at protection of the land

a. Increase the quality of the soil and water

b. Drainage

c. Embankment

d. Stone collection

e. Forbid stubble burning

An annual payment of US $400 per ha for 3 years will be paid to the producers who give up on existing producement and leave the land uncultivated and apply one or more of the above mention practices.

CATEGORY II:

Environment Friendly, Suitable Agricultural Techniques and Similar Cultural implementations

a. Change Tillage style (Contour Tillage)

b. Economical Irrigation

c. Controlled pesticide, fertilizer and hormone usage

d. Usage of organic, green, barn fertilizer compost etc.

e. Organic agriculture, good agricultural practices

An annual payment of US$ 900 per ha for 3 years will be paid to the producers who maintain existing cultivation or make transition alongside with the application of one or more of the above mentioned practices.

CATEGORY III:

Prevention of Extensive Grazing, meadow – pasture rehabilitation, production of feed crops

a. Meadow – pasture crops, Producement of Fodder and natural plants

b. Production of feed crops

An annual payment of US $400 / ha for 3 years will be made towards meadow – pasture rehabilitation and the

prevention of extensive grazing.

Producers who benefit from CATAK payments can not benefit from DIS payments during the programme.

6.4 Opportunities under IPARD 2007-2013

Priority Axis 2 of the IPARD Programme includes provision for so-called "preparatory actions" for the implementation of pilot agri-environmental measures and local rural development strategies. These measures will not be implemented immediately in Turkey, but will be postponed until the second phase of IPARD from 2010-2013 in order to allow sufficient capacity-building amongst policy-makers, administrative staff etc.

The pilot agri-environment measures will be implemented in selected pilot areas with the general objective "to develop **practical experience** with regard to the implementation of agricultural production methods designed to protect the environment and maintain the countryside"

Eligible participants for the pilot measures will include individual farmers, agricultural co-operatives, agricultural enterprises, NGOs and public institutions which own and/or lease land in the pilot areas to be defined. Participation in the pilot measures will be voluntary, but once committed there will be an agri-environment contract lasting 5 years.

The amount of public aid offered to farmers participating in the pilot agri-environment measures will be 100% (of which 80% will be contributed by the European Union).

The presentation of technically well-prepared proposals for preparatory actions will be essential for the fast approval of pilot agri-environment projects by the European Commission.

Technical fiches should be prepared for a range of contrasting pilot projects according to the following format:

- Rationale for the pilot project
- Geographic definition and description of the pilot areas
- A description of the proposed objectives (general and specific) of the pilot measures and their justification in view of the characteristics of the pilot area
- Type of pilot actions to be implemented and the conditions for entering into management agreements
- Type of beneficiaries
- Eligible conditions for aid
- Amount of support
- Aid intensity
- Selection procedures
- Plans and procedures for control of payments
- Indicators for the monitoring and evaluation of pilot measures

In order to create the best opportunities for **practical experience** and learning by doing it is recommended to:

1. Start pilot actions as early as possible and connect them to the on-going policy-making process. For example, many new schemes were piloted throughout the evolution of agri-environment schemes in England (see

Figure 6.3).

2. Implement simple, well-defined pilot actions which are appropriate to national/regional context. For example, the pilot measures should:

- address specific environmental problems;
- be easily controlled;
- be few in number to simplify administrative work;
- be easy for the farmers to understand;
- and have a payment rate that is attractive for the farmer, but not excessively high.

3. Adopt administrative procedures which:

a. ensure **rapid implementation** of pilot actions
b. are **appropriate for continuation or adaptation** to future agri-environment schemes, and
c. develop **relevant experience and long-term capacity** amongst administrators.

4. Test the pilot actions and administrative procedures under a **variety of farming and environmental conditions.**
Selection of the pilot areas will be a critical part of developing the pilot agri-environment projects. The areas selected must be well justified and understood by everyone with a specific

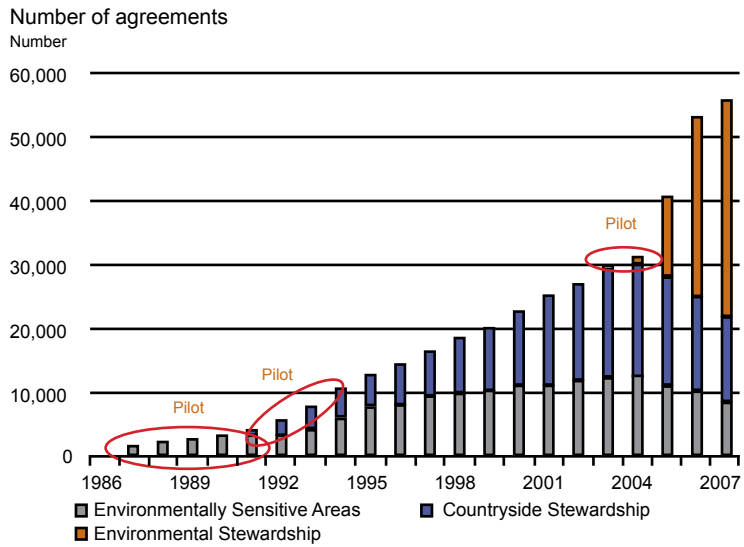


Figure 6.3: Use of pilot schemes during the evolution of agri-environment schemes in England (1986-2007)

interest in the development and implementation of the pilot projects.

In order to prove the applicability of the selected agri-environmental measures (especially the HNV measures) to the Turkish context and help prepare for accession negotiations, it will be useful to test the pilot agri-environment measures in a range of different agricultural and environmental circumstances. This means that the pilot areas selected should ideally be contrasting with respect to:

- the basic natural factors (e.g. lowland or mountain) which shape the landscape and influence the environmental conditions in the area;
- agricultural activity and farming systems;
- the type of farmers – since the effectiveness of the agri-environment approach in Turkey will ultimately depend upon the participation of farmers it will be useful to test the uptake of the pilot measures under different socio-economic and demographic circumstances e.g. size of farms, social structure and "mentality" (especially the openness of local farmers to new ideas);
- the prevailing environmental problems and priorities.

The individual areas selected should also have certain characteristics for successful implementation of a pilot project. They should:

- be easily defined with clear boundaries such as the administrative borders of local communities or municipalities, the boundaries of well-defined eco-systems, the borders of protected areas or a special landscape region with a clear identity. Because land-ownership is commonly fragmented in Turkey, it may be advisable to have some flexibility concerning the boundaries of the pilot area in order to allow farmers to participate in the pilot project who do not have 100% of their land packages within the designated area;
- have a large proportion of land used by private farmers e.g. it should not have a large proportion of abandoned land nor should it be owned predominantly by the state;
- not have too many existing environmental regulations and restrictions on the activities of farmers since this will limit the opportunities for paying farmers to adopt environmentally-responsible practices ;
- have local organisations (or local offices of national organisations) that are willing and interested to collaborate in the pilot project;
- have good sources of environmental/ biological data and information available for establishing an effective monitoring system;
- be of a size that is easily managed (although this will depend to some extent upon the characteristics of the area).

Finally, remember that early and wide consultation with farmers and other stakeholders will avoid problems later.

6.5 Potential Agri-environment Measures to Support HNV Farmland in Turkey

As explained in Section 3.2, experience from the European Union suggests that three general types of HNV farmland can be identified:

- HNV Farmland Type 1 – semi-natural vegetation that is used for low intensity grazing;
- HNV Farmland Type 2 – a mixture/ mosaic of low-intensity cropland and semi-natural vegetation;
- HNV Farmland Type 3 - more intensively managed crops and grassland which support certain rare species of conservation concern.

All three types of HNV farmland also exist in Turkey and would benefit greatly from the introduction of agri-environment measures to support the traditional management practices that benefit the biodiversity associated with them. The following sub-sections introduce some potential agri-environment measures that could be applied in Turkey. It must be stressed however that these are only indicative! There is a huge diversity of conditions in Turkey and the pressures upon HNV farmland vary from region to region (as already illustrated in Section 4.4). The objectives and design of agri-environment measures should reflect this variation and be regionally or locally specific.

6.5.1 Measures to Support Type 1 HNV Farmland

Type 1 HNV farmland in Turkey is predominantly semi-natural vegetation

associated with the rangelands. This rangeland can be divided into two types:

1. State-owned rangeland used for grazing – with an estimated area of 13.6 million hectares, including:

- a relatively small proportion of "lowland rangeland" (less than 800 metres altitude) in the coastal areas;
- a much larger proportion of "upland rangeland", of which most is found in the Central and Eastern Anatolia plateau at altitudes of 800 – 1 700 metres, plus;
- alpine pastures over 1 700 metres found in the mountains of the eastern Black Sea region and Eastern Anatolia.

Most rangelands are grazed free of charge, boundaries of the pastures are not clearly determined or assigned to village communities and, in the absence of any tenure, the users have no incentives or motivation to invest in maintenance of the rangeland. These are major problems that the 1998 Rangeland Act (see Section 2.6.1) aims to address.

2. Privately-owned meadows used for hay-making – with an estimated area of 0.6 million hectares these are typically located close to the villages and irrigated along with other crops. Hay is cut once per year and stored according to various local traditions. After being cut for hay the meadows will be communally grazed along with forage crops and stubbles on cropland around the village.

Available data on the biodiversity value of semi-natural grasslands are currently very fragmented and much more work is needed on the

assessment/evaluation of the vegetation complexes in the rangeland areas for species and habitats of global/European importance in accordance with IUCN criteria, EU Habitat Directive etc. However, semi-natural grazed habitats are clearly identified as a priority for biodiversity conservation, including the targeting of agri-environment measures. It is also expected that the on-going national rangeland monitoring and improvement project will help with the determination of rangeland status, productivity and species distribution.

State-owned rangeland and privately-owned meadows are used by both extensive and semi-intensive livestock systems (see Section 4.2). Those livestock systems that are most likely to be HNV are the extensive grazing systems with cattle, sheep or goats, including:

- Highland Mixed Farming
- Alpine Farming
- Forest Farming (Mixed, Livestock and Seasonal Grazing)

This includes a strong tradition of mountain pastoralism ("Yayla") in the Black Sea and Eastern Anatolia regions where the most productive pastures are at high altitude and herders move their animals into the mountains in early summer and stay there until the end of the grazing season.

Typically livestock are grazed on rangelands around the villages at lower altitude until May/early June when the available forage starts to dry up due to the summer weather. Groups or herds of livestock are then driven into the mountains to temporary settlements where the livestock owners/shepherds move and live with their families. Individual groups of animals will be allowed to graze freely around the temporary settlement for 10-15 days until all animals from the village have arrived, they will then be combined into communal herds for more systematic grazing of the available pastures for the next 3 months (July – September). Sometimes a shepherd is hired to manage this communal herd, but this is an increasingly expensive option for small-scale livestock owners.

This traditional system is now changing and it is becoming less common for smaller herds to be combined into a larger herd for grazing. Instead many farmers are giving up small-scale sheep and goat farming and production is becoming limited to a smaller number of farmers in the villages with much larger herds (200-1000 heads) who can afford to hire a shepherd.

These systems are exposed to a range of pressures, including a) overgrazing in lowland (especially in those areas closest to the villages) and upland regions, and; b) undergrazing (leading to an encroachment of scrub and a loss of biodiversity values) in the more isolated mountain areas. The overall objective of this suite of measures is therefore to maintain semi-natural vegetation at a grazing intensity that supports high levels of biodiversity.

Extensive Grazing of HNV Rangeland

Objectives

- To prevent the loss of HNV rangeland in lowland and upland areas through over-grazing or conversion to arable land and other crops.
- To conserve and maintain semi-natural grazed habitats through the continuation of traditional management practices in areas of HNV rangeland.

Geographical Scope

In the absence of a comprehensive inventory of semi-natural grazing land, this measure should initially be targeted at rangelands of known high nature value (e.g. in designated Key Biodiversity Areas) in lowland and upland areas.

However, the measure should only be available in those municipalities where the 1998 Rangeland Act has been, or is in the process of being, implemented and:

- the boundary and area of the available rangelands has been clearly determined;
- the right to use these rangelands has been allocated to one or more villages;

- a Provincial Rangeland Commission has been established to supervise rangeland management and is working in partnership with a local community "organisations" (e.g. the village muhtar);
- local farmers are required to a) have a "grazing agreement" for using a clearly defined area of rangelands and b) to follow minimum management requirements to maintain the productivity of the rangeland.

Only unimproved areas of rangeland of known biodiversity value will be eligible to include in the measure. Areas of rangeland which have been subject to agricultural improvement or rehabilitation (e.g. reseeding, fertilisation) under the Rangeland Act will not be eligible.

Definition of Beneficiaries

Potential beneficiaries for this pilot measure could be:

1. individual farmers who a) own cattle, sheep or goats (the minimum herd/flock size should be defined) and have permission to graze on state-owned rangeland;
2. legal entities (such as the Village Rangeland Management Units) that have responsibility for the management of state-owned rangeland;
3. Some groups of farmers or companies who rent state-owned land for grazing.

Note that shepherds are normally hired by individual farmers to manage their herd/flock of cattle, sheep or goats and are unlikely to be defined as beneficiaries.

Management Requirements

Beneficiaries of agri-environment payments under this measure will be required to manage clearly identified areas of unimproved state-owned rangeland for a minimum period of 5 years according to the terms of an agreed "rangeland management plan".

This management plan will include compliance with:

1. Baseline management requirements included in the grazing agreements issued for using the rangeland (in accordance with the Rangeland Act). These baseline requirements are intended to maintain the productivity of the unimproved rangeland, including the total number of grazing animals (stocking rates), dates of the grazing season, obligations for rotational grazing and maintenance of boundaries between grazing areas.
2. Higher level management requirements that go beyond the "baseline" requirements in order to

maintain and enhance the biodiversity value of unimproved rangeland. This should be based upon an understanding of the relationship between the local farming system and biodiversity, and might include:

- prohibition of fertiliser and pesticide use on the unimproved rangeland;
- prohibition of any ploughing or cultivation of unimproved rangeland;
- additional restrictions on maximum stocking rates, and minimum stocking rates where abandonment and scrub-encroachment is a threat;
- a reduced grazing period;
- stricter requirements for rotational grazing including the use of rehabilitated pastures, forage crops and arable areas (e.g. stubble grazing) for temporary or seasonal grazing in balance with use of the unimproved semi-natural grassland;
- a supplement for the use of traditional breeds of cattle, sheep or goats (according to an approved list of breeds).

There will be no payment for compliance with the baseline requirements, only for the loss of income and additional costs incurred by the higher level requirements. Some flexibility with the implementation of the baseline requirements is also suggested. For example, farmers might be allowed some time to adjust to the baseline requirements without limiting the possibility of receiving agri-environment payments.

Traditional Grazing of HNV Mountain Pastures ("yayla")

Objectives

- To prevent the loss of HNV mountain pastures through over-grazing or abandonment.
- To conserve and maintain semi-natural grazed habitats through the continuation of traditional management practices in HNV mountain pastures.
- To contribute to the conservation of local animal breeds associated with traditional grazing systems.
- To provide socio-economic benefits for rural communities in the most isolated mountain communities.

Geographical Scope

In the absence of a comprehensive inventory of semi-natural grasslands,

this measure should initially be targeted at regions with a history of traditional mountain grazing in the Black Sea and Eastern Anatolia regions.

However, the measure should only be available in those municipalities where the 1998 Rangeland Act has been, or is in the process of being, implemented – see the Extensive Grazing of HNV Rangeland measure above.

Definition of Beneficiaries

Potential beneficiaries for this pilot measure could be:

1. individual farmers who a) own cattle, sheep or goats (the minimum herd/flock size should be defined) and b) have permission to graze on state-owned mountain pastures;
2. groups of co-operating farmers who a) own cattle, sheep or goats (the minimum herd/flock size should be defined) and b) have permission to graze on state-owned mountain pastures and share the responsibility of shepherding;
3. legal entities (such as the Village Rangeland Management Units) that have responsibility for the management of state-owned mountain pastures.

Note that shepherds are normally hired by individual farmers to manage their herd/flock of cattle, sheep or goats and are unlikely to be defined as beneficiaries.

Management Requirements
Beneficiaries of agri-environment payments under this measure will be required to manage clearly identified areas of state-owned mountain for a minimum period of 5 years according to the terms of an agreed "rangeland management plan".

This management plan will be similar to that required for the "Extensive Grazing of HNV Rangeland" measure above, plus additional compensation will be provided for:

- Maintenance of a defined number of grazing animals (within minimum and maximum limits);
- Clearance of unwanted vegetation;
- Maintenance of structures necessary for livestock management in the mountain pastures (some additional investment funding should also be provided for new structures);
- Losses of livestock due to large predators (with the condition that large carnivores are not killed).

6.5.2 Measures to Support Type 2 HNV Farmland

There is a wide range of mixed farming systems in Turkey which result in a mosaic landscape consisting of different land uses. These mosaics can support high levels of biodiversity and when present in association with extensive management practices and the presence of semi-natural vegetation and features, are likely to be of high nature value.

Those systems that have been identified as potential HNV farming systems, include:

- extensive arable (cereal pulses, including a rotation of wheat, barley, rye, dry bean, lentil and chickpea);
- cereal forages, including alfalfa, vetch and sainfoin;
- cereal fallow, including wheat, barley and rye, and;
- permanent crops, including nuts, fruit orchards, olives and vineyards (only in very limited situations).

Some of the extensive grazing systems which include the production of fodder crops described above may also result in Type 2 HNV farmland. These systems are only considered as HNV when under low-intensity cultivation practices and with the presence of a minimum proportion of semi-natural vegetation (peripheral features and/or grazing land). Where such low-intensity systems survive, they are exposed to a range of pressures which will threaten the biodiversity associated with them, including the removal of field boundaries, the rationalisation of fields, enlargement of farm holdings, specialisation in production and the concentration of production at the regional scale, technological improvements/mechanisation, increased use of chemical inputs, as well as the abandonment of more marginal land.

The objective of the measures set out below is to steer the restructuring process in such a way as to maintain a fine grained mosaic landscape structure, and to support the maintenance of farmland features and low-intensity

cultivation practices. In addition, a number of specific measures aimed at the maintenance of HNV traditional orchards and vineyards are included.

Maintenance of Low-intensity Landscape Mosaic

Objectives

- To maintain mixed farming systems.
- To maintain the ecological infrastructure at a landscape scale to provide food sources, nesting sites and migration pathways of species of conservation concern.
- To maintain and promote low-intensity cultivation systems in mosaic landscapes.

Geographical Scope

This measure will be targeted at those regions identified as having a high proportion of HNV Type 2 farmland.

Definition of Beneficiaries

Private farmers, natural or legal entities that own, lease or rent land. Where land is rented, rental agreements of at least 5 years are recommended, but shorter periods can be accepted at the risk of the beneficiary.

Management Requirements

A menu of typical measures follows and different combinations should be selected depending on the type of farming system, local conditions and the nature of the pressure upon the HNV farmland:

Retention or establishment of uncut field margins and boundaries along water courses;

- Retention and appropriate management of field boundaries, including stone walls, hedgerows etc.;
- Retention and appropriate management of all semi-natural features, including trees, bushes, natural field boundaries, ponds etc.;
- Maintenance of traditional rotations, including a minimum proportion of fallow;
- Retention of cereal stubbles over winter;
- Retain sheep and goat production as part of an extensive arable farming system in order to maintain feeding source for vultures, spreading of seeds of wild flora, and because it helps to maintain a mixed system and mixed land cover with elements of semi-natural grazing;
- Restrictions on the use of agro-chemicals. Depending upon the specific characteristics of the farming system this might include actions such as restricting the use of chemical fertilizers, prohibiting the use of broad-spectrum insecticides or requiring the use of mechanical weed control techniques. Supplementary payments should also be offered for adopting organic production or Integrated Crop Production (e.g. EurepGAP production standards[1]);

[1] EurepGAP is an international body (private sector) that sets voluntary standards for the certification of agricultural products from farming systems that make more rational use of fertilisers, pesticides and water.

- Avoid the cultivation and planting of marginal land with annual crops. These areas should be planted with drought resistant trees such as almond and walnut;
- Use of local crop varieties.

Management of Traditional Fruit/Nut Orchards and Olive Groves

HNV Traditional Orchards are typically characterised by:

- Extensive management;
- Mature fruit (e.g. older than 25 years);
- Mixtures of local varieties;
- Widely-spaced trees (there should be a maximum distance specified for the spacing of trees in order to define the boundary of the orchard where it is not clearly marked);
- In some regions, the orchard floor having a continuous (or near continuous) grass cover that is commonly used for grazing animals. This grass cover is often species-rich and an important semi-natural habitat.

Geographical Scope

This measure will be targeted at those regions identified as having a high proportion of HNV Type 2 farmland.

Definition of Beneficiaries

Private farmers, natural or legal entities that own, lease or rent land with orchards containing fruit or nut trees of specified varieties (a list of local varieties eligible for support should be produced). Where land is rented, rental agreements of at least 5 years are recommended, but shorter periods can be accepted at the risk of the beneficiary.

Management Requirements

- Retain all living fruit trees;
- Planting of younger trees from varieties already existing in orchard or other local varieties;
- Ensure regular pruning to maintain the

characteristic “form” of the trees (this will vary according to the tree type and variety);
- Appropriate management of the orchard floor. This will depend upon the region. For example, in the Black Sea region the grass-covered orchard floor should be maintained through grazing or mowing at levels which support the species richness of the grassland. In drier areas with no grass cover, farmers should not be permitted to have bare soil all year around but should allow vegetation to develop under the trees until late spring (dates to be fixed according to the locality). Cultivation should then be permitted for weed control (this is only be permitted be in late spring in order to allow the life-cycle of flora and associated invertebrates);
- No fertilisers or herbicides to be applied to the floor of the orchard;
- No damage to standing fruit trees by grazing livestock or mowing equipment;
- Burning of grass or wood in orchard is prohibited;
- Supplementary payments should also be offered for adopting organic production or Integrated Crop Production (e.g. EurepGAP production standards).

6.5.3 Measures to Support Type 3 HNV Farmland

Type 3 HNV farmland is typically more intensively managed compared to Types 1 and 2 and its importance for biodiversity is derived from the fact that it supports bird species of European and/or global conservation concern. In Turkey, these areas are likely to be cultivated steppelands which support populations of Great Bustard and other steppeland species. Pressures on the biodiversity value of these areas typically result from intensification of the cultivation system (for example, through irrigation) and the removal of farmland features. [Other areas might include rice cultivation in wetlands.

Measures to Support Bird Species of Global and/or European Conservation Concern Associated with Steppelands

Operational Objectives
- Improving conditions of farmland for steppe bird communities.
- Reducing overgrazing to improve conditions for wildlife.

Geographical Scope

This measure will be targeted at those regions identified as having a high proportion of HNV Type 3 farmland.

Definition of Beneficiaries

Private farmers, natural or legal entities that own, lease or rent land. Where land is rented, rental agreements of at least 5 years are recommended, but shorter periods can be accepted at the risk of the beneficiary.

Management Requirements

A variety of options could be offered to farmers which they can select according to their specific farming system:

I. Basic Scheme	• Extensification of arable cropping to benefit flora and fauna; • Sowing of legumes on fallow land, as part of arable rotation; • Taking land out of production to create wildlife habitat; • Sowing extra seed (for birds); • Stocking density (Livestock Units per hectare) maintained in accordance with advice by local experts based on knowledge about the farming system, the productivity of land and other factors which influence the relationship between grazing intensity and biodiversity; • Maintaining ecological infrastructure of the landscape, especially semi-natural field margins and patches.
II. Extensification of Arable Cropping	• Keep a full record of cropping activities during the five year period; • Maintain field margins and other patches of semi-natural vegetation, covering specified proportion (%) of the farmed area; • Maintain stubbles without tillage during autumn and winter; • Seeds must not be treated with biocides that are harmful to steppe birds; • Manage fallow land according to a "fallow calendar" established by an appropriate Technical Committee; • Increase seed rates by 20kg/ha/year.
III. Complimentary Measure	• Sow a proportion of fallow land with legumes, to benefit steppe birds; • No use of agro-chemical inputs; • Controlled grazing is permitted within certain stocking density limits;
IV. Taking Land Out of Production	• Minimum 1 ha (or another minimum area specified according to local circumstances); • Must have been previously under cultivation or grazing use; • Must be managed as wildlife habitat; • Controlled grazing may be permitted.

Section 7

Implementation of a National Agri-environment Programme

The administrative arrangements required to set-up a system of agri-environment support payments – whether for a National Agri-environment Programme or a pilot agri-environment scheme – will vary according to the governmental and administrative structures of each country. However, the implementation of any agri-environment payment system is a considerable administrative challenge in the early years and this section therefore aims to outline some key practical issues relating to:

- Institutional Arrangements
- Administrative Procedures
- Monitoring and Evaluation
- Actions for Supporting Implementation

7.1 Institutional Arrangements

The institutional arrangements and procedures adopted for implementation of a national agri-environment programme should be realistic. The administrative complexity of scheme and contract design should be adapted to the level of administrative resources available and, where relevant, without endangering the minimum standards for EU approval. In many cases it will be necessary to increase the staffing level of the responsible institutions. Increased capacity is often essential to ensure the efficient and timely delivery of agri-environment payments when they are first introduced. This is of critical importance since any delays and problems with implementation (especially payment!) tends to diminish the good will of the farmers, with potentially serious consequences for the success of any future programme.

Most schemes in the EU are carried out by agricultural ministries and their regional offices. In a few cases an environmental administration may be responsible. The two main administrative bodies required are a Managing Authority and Paying Agency. These are usually established separately since they have two very distinct functions.

The Managing Authority is the lead organisation for developing and implementing the overall agri-environment programme and should be the one that has the greatest credibility with farmers, as well as sufficient administrative capacity (including a well developed regional/local network) and expertise. At the same time it should make use of, and have access

to, specialised expertise in other government agencies, technical and research institutions, extension services etc. The Paying Agency is specifically responsible for the administration and control of the agri-environment payments to farmers. It is unlikely to have any direct input to the development of measures, but does have a key role to play in the monitoring and reporting of uptake etc.

The importance of the multi-stakeholder process for supporting the development of agri-environment payment schemes has already been emphasised (Section 5.6) and this should continue during implementation. Good working co-ordination or liaison procedures are important for successful and coherent implementation of agri-environment schemes. Feedback on the progress and acceptance of measures, as well as on possible administrative problems, is vitally important and can be gained through regular meetings of an Agri-environment Working Group or other consultative committees. Even though they may only meet once a year they can bring considerable outside expertise into the running and evaluation of agri-environment programmes.

7.2 Administrative Procedures

Figure 7.1 gives an overview of the main administrative procedures associated with the implementation of an agri-environment scheme. The Figure indicates the potential division of responsibility between the Managing Authority and Paying Agency, but this will vary from country-to-country. Some additional notes and comments are provided below.

7.2.1 Information and Advice

The provision of good information and advice to farmers is important for ensuring high levels of scheme uptake. Direct contact between knowledgeable scheme officers and farmers is the best way to convince them to sign a management contract. In the UK, for example, it has proved very successful to designate a special project officer for each agri-environment scheme. These officers maintain continuous contact with the farmers in their area, advising them on the selection of contracts and best management practices, as well as monitoring compliance with the agreement, and reporting scheme results. However, if face-to-face contact with farmers is not feasible due to a shortage of scheme officers, written material can be sent to them directly and information disseminated through the farming press.

Once a contract is signed, it is important that farmers do not feel 'abandoned' by the authorities. Most of them will have problems and questions, particularly in the first year, just as they would if they were growing a new crop. The scheme should anticipate this need and make it easy for them to get advice.

7.2.2 Dealing with Applications

Fast and efficient processing of applications helps to keep farmers engaged in the scheme. Conversely, bureaucratic delays and problems are a serious deterrent for farmer participation and thus, sufficient administrative resources need to be made available for this task. Furthermore, the complexity of application forms should be kept to a minimum for ease of administration and to simplify the application process for farmers.

There are several well-tried ways of ensuring a smooth application process:

- Arrange local Question & Answer (Q&A) sessions for groups of farmers, when details of the scheme are agreed but before applications start. These must be run by an organisation that farmers respect, and must have someone there who can answer questions fully and accurately;
- Provide farmers and community leaders with Q&A information sheets;
- Make the initial application form a simple expression of interest, perhaps just name, location of farm and land tenure details. Follow this with a visit from a government trained adviser or project officer who checks that the farm is eligible and prepares the detailed application or contract (the adviser may be employed by the government, or by a farmers' organisation or NGO).

7.2.3 Land Parcel Identification

Agri-environment support payments are area-based and therefore need to be administered at the level of the "land parcels" that are managed by farmers. An effective and functional system of land parcel identification is therefore essential, including the possibility to provide farmers with copies of accurate maps of their land.

For example, during the introduction of agri-environment pilot schemes in Bulgaria and Romania in 2006 and 2007 **paper-based cadastral maps** were used to identify and control the land entered into management agreements. The cadastral maps gave a unique number and gross area of land parcels, plus they were easily available and familiar to farmers. However, although this system was functional in the short-term and enabled pilot actions to start, it had two major limitations:

a. The land cadastre was rapidly becoming outdated and was not therefore appropriate for continuation or adaptation to future agri-environment schemes, and

b. it did not develop relevant experience and long-term capacity amongst administrators.

Ideally agri-environment measures should be administered using a graphical Land Parcel Identification System (LPIS), such as that required by the EU for the administration of all area-based support payments to farmers.

7.2.4 Ensuring Contract Compliance

An "agri-environment management agreement" is a legally-binding contract between a farmer and the relevant

Figure 7.1: Overview of Main Administrative Tasks for the Implementation of Agri-environment

Farmer Preparation Phase

Tasks and responsibilities may be divided between with Managing Authority and Paying Agency

Publications and information e.g. preparation of promotion and information materials for applicants

Supporting the application process e.g. distribution of application forms in pilot areas, provide maps to farmers, telephone consultation, initiation of visit by farm advisor (if funding is available) etc.

Application and Selection Phase (preparation of "Management Agreements")

Clearly defined "window" (e.g. 2-3 months) for applications "Management Agreements" are only prepared once per successful applicant during the programming period (unsuccessful applicants may re-apply next year)

There should be close co-operation and communication between the Managing Authority and Paying Agency

Process application forms and supporting documents - open file for each application received, perform checks for 1) timeliness for submission and and completeness for application and 2) cross-check to relevant databases for compliance with eligibility criteria

Select eligible applications according to pre-defined criteria e.g. "first come, first served" or (where budget is over-subscribed) priority ranking criteria agreed by managing authority

Selected applications are visited by "Project Officers" in each pilot area - verify on-farm all details in application form and marked on map (applicants may still be rejected at this stage), discuss/clarify management requirements (including baseline obligations) and make any final amendments to application

Prepare "management agreements" (5 year duration) for successful applicants - calculation of support payments, statement of legal basis, notification of any special conditions, signed and DATED decision letter etc.

Notify unsuccessful applicants - implement appeals procedures if necessary

Received signed "management agreements" back from agreement holders (beneficiaries) - begin period of compliance with "management agreement"

Annual Payment Phase

This is a separate phase from application and repeated annually for all "management agreement holders"

Sole responsibility of the Paying Agency

Agreement holders submit annual claim for payment, including statement of compliance with terms of "management agreement"

"on-the-spot" control according to risk analysis - of compliance with a) baseline obligations and b) terms of individual management agreement

Adjustment of support payments subject to control procedures - taking account of penalty and sanction system agreed with managing authority

Annual payment to beneficiary - at the end of each year of management agreement (advance payments may also be made)

Reporting Phase

This should be close co-operation and communication between the Managing Authority and Paying Agency

Reports - preparation of financial declaration and progress reports for managing authority and EU, notification of irregularities, etc.

Inspection and audit procedures

authority, often the local or national office of the Ministry of Agriculture. It specifies the activities which a farmer is required to undertake in exchange for public monies, and reinforces the idea that under Agri-environment schemes a farmer is paid from public funds to deliver environmental outputs and services. The contract ensures that payment is linked to quantifiable outputs and sets out compliance checks to encourage transparency and accountability.

Indeed, agri-environment schemes can only achieve their goals if farmers comply with the commitments as set out in their management agreement which, in turn, requires effective control procedures. These should include administrative controls as well as on-the-spot checks. On-the-spot-checks are probably the most efficient means of ensuring contract compliance. In the EU, at least 5 percent of holdings in an agri-environment scheme need to be inspected by this method every year. As far as possible, all the conditions agreed to by the farmer shall be investigated in one inspection visit.

If either side fails to comply with the commitments as set out in the agreement, infringement procedures can be issued, including, for example, the withdrawal of payments or exclusion from the scheme. During the early years of the scheme, as farmers get used to it, penalties should not be too harsh and exclusion from the scheme should be avoided as this may have negative impacts on the environment.

7.3 Monitoring and Evaluation

Monitoring and evaluation are important aspects of the normal "cycle" of the agri-environment policy-making process (Figure 7.2) and should be given a high priority when establishing any agri-environment payment scheme.

At a national or regional level, the main aim of monitoring and evaluation activities is to gather information that provides feedback to policy-makers and scheme managers on the PROGRESS and PERFORMANCE of policy implementation – in other words, how well an agri-environment scheme is functioning practically and whether it is achieving the objectives that have been established for it.

Monitoring and evaluation at this level should be considered as part of an "active learning process" for policy-makers and scheme managers that enables them to:

a. review and revise existing schemes

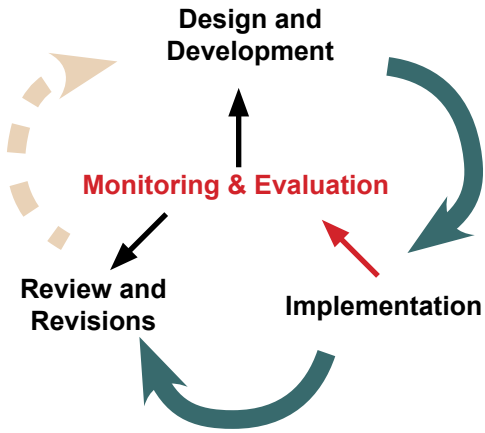


Figure 7.2: The "Cycle" of Agri-environment Policy-making

and measures, and/or
b. improve the design and development of future schemes and measures

Since the design of monitoring and evaluation procedures can be quite complex they require early and careful planning from the moment that an agri-environment scheme is first elaborated.

Additionally, where EU co-financing is used for scheme implementation, then the monitoring and evaluation procedures designed for use at a national level must also be capable of satisfying the "external" monitoring and evaluation requirements imposed by the European Commission.

The European Commission is increasingly committed to greater monitoring and evaluation of all EU funding programmes (including agri-environment payments) in order to:
a. review, revise and improve the effectiveness of funding programmes at achieving strategic policy objectives
b. enhance the "transparency" and "accountability" of EU funding programmes
c. ensure that EU assistance programmes deliver "good value for money" for the European taxpayers that fund them.

The European Commission has introduced a comprehensive suite of indicators - the Common Monitoring and Evaluation Framework (CMEF) - to evaluate the extent to which the rural development programmes are successful in meeting the strategic priorities of the European Union. For example, certain indicators relate to the conservation of HNV farmland and at the end of the programme, evaluators will assess the extent to which the measures in place have been successful in maintaining the extent and condition of HNV farmland.

There are four main types of indicator included in the CMEF:

- **Input indicators** relate to the budget allocated to specific measures and are commonly used to monitor the progress of implementation in terms of the payment of the funds to farmers;
- **Output indicators** relate to the uptake of specific measures generated by the financial inputs – they are usually quantified in physical or monetary units (e.g. number of new contracts with farmers, number of hectares supported etc.);
- **Result indicators** relate to the direct and immediate effect brought about by a measure/scheme and provide information on changes to the activities of the beneficiaries (e.g. area of land receiving pesticides, area of land with a particular crop, number of newly planted trees, length of soil erosion barrier etc.);
- **Impact indicators** refer to the consequences of the programme beyond the immediate effects upon its direct beneficiaries. The measurement of impact is more complex – especially for those impacts that have long-term effects (e.g. improvements in water quality). Some impact indicators are established and recorded at the start of the rural development programme – these are called base-line indicators and are an important reference point for the evaluation of impacts of single measures and programmes as a whole.

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Annex 1
Criteria for Use as Indicators of HNV Farmland

Land Cover Criteria

Type 1 HNV farmland is relatively easy to identify since land which is under predominantly semi-natural grazed vegetation is the strongest single indication of HNV farmland. Even if the current grazing or management regime is not the optimum for habitat and species conservation, the mere presence of large areas of semi-natural vegetation provides greater opportunities for a range of wildlife than land where this vegetation has been replaced with improved grassland or crops.

The best approach for identifying Type 1 HNV farmland is to use a recent and comprehensive inventory of semi-natural vegetation types. For example, inventories of semi-natural grasslands as produced in some countries (see www.veenecology.nl) are a valuable tool for identifying the location of this particular type of HNV farmland.

Identifying Type 2 HNV farmland is more challenging since the type of land cover is more complex and includes a mix of semi-natural vegetation and cropped land. Identifying only the semi-natural element is not a sufficient approach as the nature value of Type 2 HNV farmland also depends on the presence of low-intensity cropping and its existence in a mosaic with semi-natural vegetation (with some landscape features also important). Some measurement of the proportion of land under semi-natural vegetation is therefore needed, but this should be combined with a measurement of the intensity of use on the cropped area and number of crop types.

Up-to-date maps of agricultural land use are therefore very useful, but these are not always easily available. Other forms of land cover data (if available at a sufficiently high resolution) can also show the presence of unfarmed features, such as semi-natural hedges, patches and water bodies that can make a significant contribution to the nature value of Type 2 HNV farmland.

In the absence of other more appropriate data sources it is possible to make some use of CORINE land cover data to indicate the distribution of land cover categories that are potentially managed by HNV farming systems. This includes (Table 4.4) agricultural land cover categories, plus other categories that are not agricultural but may be used for extensive grazing on semi-natural vegetation. For example, the

map in Figure 3.3 was generated by the European Environment Agency partly using CORINE land cover data.

However this is an imperfect solution and special care must be taken in interpreting the results. One of the biggest limitations of the CORINE land cover data is that the land use categories are not sufficiently refined for distinguishing the different types of agricultural land use associated with HNV farming systems.

For example, although CORINE data can be useful for mapping certain

CORINE Agricultural Land Cover Categories			CORINE Land Cover Categories that may be under Livestock Grazing	
	Likelihood of Being HNV?			Likelihood of Being HNV?
2.1.1: Non-irrigated arable land	2		3.1.1: Broad-leaved forest	3
2.1.2: Permanently irrigated land	1		3.1.2: Coniferous forest	3
2.1.3: Rice fields	1		3.1.3: Mixed forest	3
2.2.1: Vineyards	1		3.2.2: Moors and heathlands	3
2.2.2: Fruit trees and berry production	1		3.2.3: Sclerophyllous vegetation	3
2.2.3: Olive groves	1		3.2.4: Transitional woodland scrub	3
2.3.1: Pastures	2		3.3.3: Sparsely vegetated areas	3
2.4.1 Annual crops associated with permanent crops	2		4.1.1: Inland marshes	3
2.4.2: Complex cultivation patterns	2		4.1.2: Peat bogs	3
2.4.3: Land principally occupied by agriculture with significant areas of semi-natural vegetation	2		4.2.1: Salt marshes	3
2.4.4: Agro-forestry areas	3			
3.2.1: Natural grasslands	3			

Likelihood of being HNV:

1 = Only HNV in certain very limited situations
2 = Likely to be HNV in many situations when under low intensity use
3 = Likely to be HNV in most situations

types of semi-natural vegetation such as Moors and Heathlands (3.2.2) it is of limited use for mapping HNV grasslands since the Pastures category (2.3.1) does not distinguish between the least intensive (e.g. semi-natural hay meadows) and most intensive (e.g. rye-grass) types of grassland. Similarly, for arable and permanent crops no distinction is made between extensive and intensive farming systems.

As a rough guide of the likelihood of different land cover categories being HNV, Table A1.1 also includes a simple score from 1 to 3, where:
1 = Only HNV in certain very limited situations
2 = Likely to be HNV in many situations when under low intensity use
3 = Likely to be HNV in most situations

Farming Practices Criteria
In the absence of reliable inventories of semi-natural vegetation, very low livestock densities per hectare of forage (for example, less than 0.2 LSU per hectare, although the figure will depend on the area) are themselves a strong indication of predominantly semi-natural forage and thus of Type 1 HNV farmland. For land under arable and permanent crops, a combination of low nitrogen and pesticide inputs per hectare may be considered a good indicator and help to identify Type 2 HNV farmland.

In both cases this requires the identification of "threshold values" - for example, the definition of minimum and maximum stocking densities which are in accordance with ecological criteria for the region or area in question. In some situations these may be lower than the stocking densities considered as agronomically optimal (Beaufoy, 2008).

The threshold values selected should be those considered most favourable for the conservation of species and habitats, and should ideally be identified when developing the description of HNV farming types that are identified in the typology of farming systems (Step 1). It is essential that national choices of thresholds and indicators for HNV farming are tested at the local level and a selection of local case studies from different parts of the country is useful in this regard.

At the present time, data on relevant farming practices are not generally available in the EU Member States and as a result the most common approach has been to focus on identifying the land cover patterns that indicate the probable presence of Type 1 and 2 HNV farmland.

Species Criteria
Species indicators are not necessary for identifying Types 1 and 2 HNV farmland as these are defined by land cover and farming characteristics which are known to produce a situation inherently valuable for wildlife, regardless of whether selected species are present or not.

In the case of Type 3 HNV farmland, the land cover and farming characteristics do not suggest conditions of high nature value, but it is considered HNV because of the presence of certain

species.

One approach to identifying this type of HNV farmland is through existing site designations, such as Important Bird Areas and Prime Butterfly Areas. Where such sites are predominantly under farming use, it is assumed that this farming is HNV due to the association with particular communities of birds, butterflies, etc. This is the approach taken by EEA in the map shown in Figure 3.3 in combination with the CORINE land cover approach.

However, care must be taken with this approach as there is no guarantee that all farming systems within the site boundaries are in fact HNV. It is quite possible for more intensive farmland to be found within such sites. At the same time, there may well be farming outside the site boundaries that is HNV.

Selection of Criteria

Ideally, a combination of all three criteria should be used, but this is rarely possible. The criteria actually selected for use will depend upon the type of HNV farmland and the available data. Thus for:

Type 1 HNV farmland (predominantly semi-natural vegetation used for grazing) – it is necessary to know a) that the land cover is mainly semi-natural vegetation used as forage source for grazing animals, and b) that this semi-natural vegetation is used for grazing at an appropriate stocking rate.

Type 2 HNV farmland (mosaic landscape) – it is necessary to collect as much data as possible on land cover and farming practices in order to get a full picture of the mosaic landscape. This is a big challenge, but if there is evidence of sufficiently diverse land cover and low-intensity farming practices, then the species criteria is usually assumed in principle.

Type 3 HNV farmland (presence of rare species) - evidence of HNV characteristics is related solely to the presence of species of conservation interest and this cannot be derived from land cover and farming practices criteria.

Annex 2

Relationship of CORINE Land Classification to HNV Farmland in Turkey

	Code	Category	Mostly HNV: + Partly HNV: -	Explanation
Agricultural Areas	211	Non-irrigated arable land	-	Depends on the region: large-scale cereal production in the lowland of central Anatolia is not HNV, but small-scale production elsewhere may be considered as HNV
	212	Permanently irrigated land	-	Irrigated land in intensive farming systems is not HNV, but small-scale irrigated land in narrow valley and transition zones is a characteristic mosaic and a good example of HNV
	221	Vineyards	+	
	222	Fruit trees and berry plantations	-	Commercial production in Mediterranean, Aegean, Trace and Central Anatolia is not HNV. In addition Hazelnut in Black Sea and Pistachio in South-east Anatolia is not HNV
	223	Olive groves	+	
	231	Pastures	+	
	241	Annual crops associated with permanent crops	-	Not applicable to Turkey
	242	Complex cultivation patterns	-	
	243	Land principally occupied by agriculture, with significant areas of natural vegetation	-	Partly HNV. Hazelnut and tea production areas should be extracted.
	244	Agro-forestry areas	+	Not applicable to Turkey

	Code	Category	Mostly HNV: + Partly HNV: -	Explanation
Forest and Semi-natural Areas	311	Broad-leaved forest	-	
	312	Coniferous forest	-	
	313	Mixed forest	-	
	321	Natural grasslands	+	
	322	Moors and heathland	-	Upland vegetation mostly considered HNV (this category is not applicable for Turkey)
	323	Sclerophyllous vegetation	-	Only areas in a KBA can be considered as HNV
	324	Transitional woodland-shrub	-	Only areas in a KBA can be considered as HNV
	333	Sparsely vegetated areas	+	Only areas in a KBA can be considered as HNV