Organisation for Economic Co-operation and Development
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ENVIRONMENTAL PERFORMANCE OF AGRICULTURE IN OECD COUNTRIES SINCE 1990:

Hungary Country Section

This country section is an extract from chapter 3 of the OECD publication (2008) ***Environmental Performance of Agriculture in OECD countries since 1990***, which is available at the OECD website indicated below.

This text should be cited as follows: OECD (2008), *Environmental Performance of Agriculture in OECD countries since 1990*, Paris, France

A summary version of this report is published as ***Environmental Performance of Agriculture: At a Glance***, see the OECD website which also contains the agri-environmental indicator time series database at: http://www.oecd.org/tad/env/indicators

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BACKGROUND TO THE COUNTRY SECTIONS

Structure

This chapter provides an analysis of the trends of environmental conditions related to agriculture for each of the 30 OECD member countries since 1990, including an overview of the European Union, and the supporting agri-environmental database can be accessed at *www.oecd.org/tad/env/indicators*. Valuable input for each country section was provided by member countries, in addition to other sources noted below. The country sections are introduced by a figure showing the national agri-environmental and economic profile over the period 2002-04, followed by the text, structured as follows:

- ***Agricultural sector trends and policy context:*** The policy description in this section draws on various OECD policy databases, including the *Inventory of Policy Measures Addressing Environmental Issues in Agriculture* (*www.oecd.org/tad/env*) and the Producer and Consumer Support Estimates (*www.oecd.org/tad.support/pse*).
- ***Environmental performance of agriculture:*** The review of environmental performance draws on the country responses to the OECD agri-environmental questionnaires (unpublished) provided by countries and the OECD agri-environmental database supporting Chapter 1 (see website above).
- ***Overall agri-environmental performance:*** This section gives a summary overview and concluding comments.
- ***Bibliography:*** The OECD Secretariat, with the help of member countries, has made an extensive search of the literature for each country section. While this largely draws on literature available in English and French, in many cases member countries provided translation of relevant literature in other languages.

At the end of each country section a standardised page is provided consisting of three figures. The first figure, which is the same for every country, compares respective national performance against the OECD overall average for the period since 1990. The other two figures focus on specific agri-environmental themes important to each respective country.

Additional information is also provided for each country on the OECD agri-environmental indicator website (see address above) concerning:

- Details of national agri-environmental indicator programmes.
- National databases relevant to agri-environmental indicators.
- Websites relevant to the national agri-environmental indicators (*e.g.* Ministries of Agriculture)
- A translation of the country section into the respective national language, while all 30 countries are available in English and French.

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Coverage, caveats and limitations

A number of issues concerning the coverage, caveats and limitations need to be borne in mind when reading the country sections, especially in relation to making comparisons with other countries:

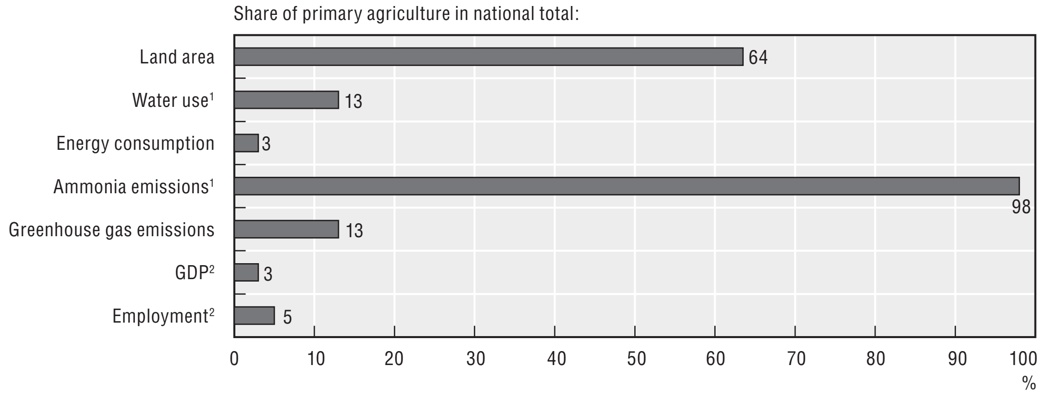
Coverage: The analysis is confined to examination of agri-environmental trends. The influence on these trends of policy and market developments, as well as structural changes in the industry, are outside the scope of these sections. Moreover, the country sections do not examine the impacts of changes in environmental conditions on agriculture (*e.g.* native and non-native wild species, droughts and floods, climate change); the impact of genetically modified organisms on the environment; or human health and welfare consequences of the interaction between agriculture and the environment.

Definitions and methodologies for calculating indicators are standardised in most cases but not all, in particular those for biodiversity and farm management. For some indicators, such as greenhouse gas emissions (GHGs), the OECD and the UNFCCC are working toward further improvement, such as by incorporating agricultural carbon sequestration into a net GHG balance.

- ***Data availability, quality and comparability*** are as far as possible complete, consistent and harmonised across the various indicators and countries. But deficiencies remain such as the absence of data series (*e.g.* biodiversity), variability in coverage (*e.g.* pesticide use), and differences related to data collection methods (*e.g.* the use of surveys, census and models).
- ***Spatial aggregation*** of indicators is given at the national level, but for some indicators (*e.g.* water quality) this can mask significant variations at the regional level, although where available the text provides information on regionally disaggregated data.
- ***Trends and ranges in indicators***, rather than absolute levels, enable comparisons to be made across countries in many cases, especially as local site specific conditions can vary considerably. But absolute levels are of significance where: limits are defined by governments (*e.g.* nitrates in water); targets agreed under national and international agreements (*e.g.* ammonia emissions); or where the contribution to global pollution is important (*e.g.* greenhouse gases).
- ***Agriculture's contribution to specific environmental impacts*** is sometimes difficult to isolate, especially for areas such as soil and water quality, where the impact of other economic activities is important (*e.g.* forestry) or the "natural" state of the environment itself contributes to pollutant loadings (*e.g.* water may contain high levels of naturally occurring salts), or invasive species that may have upset the "natural" state of biodiversity.
- ***Environmental improvement or deterioration*** is in most individual indicator cases clearly revealed by the direction of change in the indicators but is more difficult when considering a set of indicators. For example, the greater uptake of conservation tillage can lower soil erosion rates and energy consumption (from less ploughing), but at the same time may result in an increase in the use of herbicides to combat weeds.
- ***Baselines, threshold levels or targets for indicators*** are generally not appropriate to assess indicator trends as these may vary between countries and regions due to difference in environmental and climatic conditions, as well as national regulations. But for some indicators threshold levels are used to assess indicator change (*e.g.* drinking water standards) or internationally agreed targets compared against indicators trends (*e.g.* ammonia emissions and methyl bromide use).

3.11. HUNGARY

Figure 3.11.1. **National agri-environmental and economic profile, 2002-04: Hungary**



StatLink http://dx.doi.org/10.1787/300352354012

1. Data refer to the period 2001-03.
2. Data refer to the year 2004.

Source: OECD Secretariat. For full details of these indicators, see Chapter 1 of the *Main Report*.

3.11.1. Agricultural sector trends and policy context

Primary agriculture continues to play an important role in the economy, but there has been a major contraction of the sector over the period since 1990. Agriculture's share of GDP declined from nearly 14% in 1989 down to just under 3% by 2004, while over the same period farming's share of employment fell from around 17% to slightly over 5% by 2004 [1, 2, 3] (Figure 3.11.1). These changes are reflected in the –14% reduction in the volume of agricultural production (1990-92 to 2002-04), the largest decrease across OECD countries (Figure 3.11.2). Over the more recent period, from 2000 to 2005, production has increased slightly, especially for cereals, but declined for some livestock products, especially milk production [4].

The transition from a centrally planned to a market economy over the period 1990 to 2005 has had significant implications for agriculture. The fundamental change in political and social institutions as well as economic conditions, with a shift from a centrally planned to market economy, has affected how land use decisions are made, and led to extensive changes in farm ownership patterns, productivity and competitiveness [5, 6, 7, 8, 9, 10]. Overall the sharp fall in the volume of farm production during the early 1990s was induced by a major reduction in agricultural production and input support (see below), a drop in agricultural investment, and rising farm debt levels. Private family farms saw their share of the area farmed rise from around 15% in the early 1990s to over 50% by 2003-04, with a corresponding reduction in the share for large corporate farms (privatised successors of former state and co-operative farms) [11]. Research suggests that during the 1990s family farms were less productive than the remaining corporate farms, while farming remained weak in terms of international competitiveness [8, 12]. The use of purchased farm inputs also decreased (fertilisers, pesticides, energy and water) (Figure 3.11.2), and environmental investment was curtailed, such as manure storage facilities and soil erosion mitigation [13, 14]. Although the use of farm inputs stabilised and even began to rise slightly from the late 1990s, by 2005 they still remained considerably below their peak of the late 1980s [13, 15].

Farming is supported under the Common Agricultural Policy (CAP) with support also provided through national expenditure within the CAP framework. Support to agriculture has fluctuated considerably over the past 20 years. Due to the implementation of economic reforms support declined from around 45% of farm receipts in the mid-1980s down to 12% in 1995-97 (as measured by the OECD Producer Support Estimate – PSE), but then gradually rose to 28% by 2003, as policies were geared toward EU membership in 2004. The EU15 PSE was 34% in 2002-04 compared to the 31% OECD average [5, 16, 17]. Nearly 70% of EU15 support to farmers was output and input linked in 2002-04, the forms of support that most encourage production [5]. Total annual budgetary support to Hungarian agriculture was around HUF 175 billion (EUR 660 million) for 2005 and 2006, of which around 20% was nationally financed, the remainder coming from EU funding [5]. Agri-environmental measures in Hungary accounted for about 10% of total budgetary support over this period [11].

The development of agri-environmental and environmental policy has had to address several key challenges since the early 1990s. Firstly, it has been necessary to respond to the environmental problems left from the legacy of the centrally planned economy; and secondly, policy responses have been required for EU accession and membership. In the early years of transition agri-environmental policy was not a priority, while the government lacked resources to invest in environmental protection [13, 16]. Indirectly, however, through the removal of government support for the purchase of farm inputs (*e.g.* fertilisers, pesticides, energy) and other production distorting measures, this had the effect of lowering agricultural production intensity and consequently pressure on the environment. Even so some agri-environmental policies were introduced in the early/mid 1990s, such as: limits on toxic elements in fertilisers (1992); a 50% reduction in the land tax if a farmer adopted environmentally friendly technology (1992 suspended in 1994); support of up to 40% of the costs of liming acidic soils (1997); regulations covering soil conservation under the *Land Act* (1994), including per hectare payments to limit soil erosion; and financial support to promote organic farming (1997) [16, 17].

EU accession and membership from 2004 has also brought policy challenges. The EU provided pre-accession funds for agriculture up to 2006 (including for environmental purposes) through three programmes: *SAPARD*, the most important for agriculture in terms of funding the establishment of institutions and systems of policy implementation; *PHARE*, covering institutional building; and *ISPA*, to assist infrastructure development, including environmental protection [13, 17]. The EU accession period since 2004 has required the adoption of EU agri-environmental and environmental policies, and harmonisation of technical standards [5, 13]. Policies under the CAP are being phased in up to 2013, when CAP support reaches 100% of the EU15 level. The main agri-environmental programme is the *National Rural Development Plan* (NRDP) from 2004, which incorporated the former *National Agri-environmental Programme* started in 2002 [1, 11, 15, 18, 19]. The two main agri-environmental measures under the NRDP include support for farmers applying practices beneficial for the environment (*Entry Level Scheme*), such as per hectare payments to limit soil erosion, and payments provided for conversion to organic farming (*Organic Farming Scheme*) [17]. To comply with the *EU Nitrates Directive* the 2002 *Nitrate Action*

Programme established *Nitrate Vulnerable Zones* to regulate farms in terms of fertiliser and manure application and storage practices [11].

Agriculture is affected by national environmental and taxation policies. Hungary's first *National Environmental Programme* (NEP) from 1997 to 2002, sought to reduce harmful environmental impacts, preserve natural values, and create a harmonious relationship between economic development and environmental protection [16]. Regulations were used to target soil protection and reduce water pollution, with charges levied on water abstraction and removing land from agricultural production. The 2nd NEP (2004) strengthens the 1st NEP and places greater emphasis on biodiversity and landscape conservation [11]. Under the *National Afforestation Programme* the objective is to increase the share of forested land to 27% of the total land area by 2050 (it was about 20% in 2005), of which 80% of payments for new plantings between 2001 to 2010 would be on farmland [11, 18]. Support is provided for farm fuel use through a 70% tax exemption equivalent to about EUR 80 (USD 100) million of budget revenue forgone annually during 2004 and 2005 [5]. Under the *Water Management Act* (1995), now replaced by the *EU Water Framework Directive*, farmers pay a fee for the abstraction of groundwater. Under the NRDP support of HUF 77 (USD 0.31) million in 2005 was provided for irrigation infrastructure costs [17].

International environmental agreements also have implications for agriculture, with respect to limiting emissions of: ammonia (*Gothenburg Protocol*), methyl bromide (*Montreal Protocol*) and greenhouse gases (*Kyoto Protocol*). Under the *Climate Change Operative Programme*, the objectives for agriculture are to reduce methane emissions from livestock and crop cultivation and provide support for renewable energy generation [18]. For energy crops farmers can obtain support of EUR 27 (USD 34) per hectare for wheat, maize, rapeseed and sunflowerseed, and EUR 32 (USD 40) per hectare for grasses [18]. Biodiesel is exempted from value added tax and excise duty [20]. As part of its commitments under the *Convention of Biological Diversity*, Hungary is seeking to restore wetlands and implement other measures for habitat conservation under the NRDP for agriculture [21]. In addition, there is an action plan to promote conservation of plant and livestock genetic material [21]. Through the *Carpathian Convention*, established in 2006, Hungary, together with other countries in the region, is seeking the conservation of this UNESCO Biosphere Reserve, including conservation of semi-natural farmed landscapes. Hungary also has a number of other bilateral and regional environmental co-operation agreements with neighbouring countries, notably concerning water resources, as the country is entirely within the Danube basin with 95% of its water originating in other countries [22].

3.11.2. Environmental performance of agriculture

Environmental concerns related to agriculture have changed dramatically over the period since 1990. With the reduction in agricultural production and input support, and shift to a market economy, farming moved from an intensive production orientated system to adoption of more extensive farming methods, linked particularly to the large decrease in use of purchased farm inputs. During the period before transition the primary agri-environmental problem was excessive nutrient application and associated water and air pollution, but over the 1990s the problem switched to a lack of nutrients and soil degradation [11, 16, 19]. Soil erosion persists as a key issue, partly because of the legacy of decades of damaging farming practices [11, 14]. While the pressure on biodiversity has eased with more extensive farming practices, land fragmentation and cessation of farming has been a problem in some areas [11, 14].

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Soil erosion is a major and widespread environmental problem, but other soil degradation processes are a concern in some localities [11, 23]. Nearly 40% of farmland is affected by water erosion and around 25% by wind erosion, mainly in North Hungary and Transdanubia [19, 23]. The share of farmland subject to moderate to severe water erosion risk (greater than 10 t/ha/year) was around 25% over 2000-02, which has changed little since the early 1990s (Figure 3.11.3) [24]. While soil erosion risks are exacerbated by a combination of climate, steep topography and drainage conditions [23], erosion has also been aggravated by less than 1% of arable land being brought under soil conservation practices in 2000-03 [11, 19, 24]. It is possible, however, that with the increase in agro-forestry and the abandonment of farmland to permanent vegetation erosion rates could fall in some areas [14]. Although farm productivity has been impaired in areas of more severe soil erosion, off-farm problems are becoming more significant, such as sedimentation of the Lake Balaton ecosystem, and transport of nutrients into other lakes and rivers [23]. Severe ***soil acidification*** has accelerated over the past 20 years, but the area affected (13% of the total land area) has not grown significantly, partly because of the decrease in the intensity of fertiliser since the 1980s, although the annual area limed (to counteract acidification) declined from 30-40 000 hectares in the 1980s to now about 10-20 000 hectares. ***Soil salinisation*** limits soil fertility and productivity on around 15% of agricultural land [11]. Since 2000 about 50% of arable land was affected by ***soil compaction***, with about a quarter of this land suffering moderate to severe compaction, mainly from the movement of farm machinery on wet soils [11]. This problem has been accelerated in recent years because of extensive water logging followed by drought conditions, such that compaction is beginning to have an economic impact through reducing crop yields [25].

There is no significant pollution of water from agriculture, although in some locations inappropriate farming practices have led to moderate pollution risks [11]. The large reduction in phosphorus surpluses and pesticides over the 1990s has considerably eased farm pollution pressure on water bodies, although since the late 1990s use of inorganic nitrogen fertilisers and pesticides have begun to rise slightly. However, it is not possible to adequately assess the extent of water pollution from agriculture as there is no national water monitoring system for farm pollutant sources of rivers, lakes and groundwater, although projects financed by PHARE are seeking to improve the monitoring system [11, 19].

Trends in nutrient, (nitrogen – N and phosphorus – P) balances have shown great fluctuations between 1990 and 2004. In the late 1980s nutrient surpluses were at a comparable level to those of the EU15 average, although by the early 1990s the reduction in surpluses was so great that soil fertility was at risk with average national balances showing negative values. But from around the late 1990s there has been a slow increase in surpluses, although by 2004 the surpluses were still well below the averages for the OECD and EU15 (Figure 3.11.2). While the N balance has been in surplus over much of the 1990s to 2004, for much of this period the P balance has been negative (*i.e.* crop and pasture needs for P are greater than the supply of P from mainly inorganic fertilisers and P in livestock manure) [26, 27]. The reduction in support to fertilisers and crop and livestock products during the transition period explains much of the decrease in nutrient surpluses [1, 26]. This is highlighted by the fluctuations in the use of inorganic N fertilisers which fell from (figures in brackets are for P fertilisers) around 600 000 (330 000) tonnes in the late 1980s down to 150 000 (25 000) tonnes in the early 1990s, rising to about 300 000 (70 000) tonnes by 2002-04, *i.e.* half the late 1980s' level (almost one-fifth for phosphate).

Overall, with the low levels of nitrogen surpluses from agriculture, the pollution of water bodies from nitrates is generally low [19]. The rising levels of nitrogen surpluses since the late 1990s, however, have increased pressure on water quality in some areas. Within *Nitrate Vulnerable Zones* (designated under the *EU Nitrates Directive*), which accounted for around 45% of farmland between 2000-02 [11], almost 9% of groundwater monitoring points exceeded the EU nitrate drinking water standards, a situation that has deteriorated since the mid-1990s [14, 26]. Also 10% of surface water monitoring across the country exceeded the EU nitrate water standards. The nitrate pollution of groundwater is largely associated with large-scale intensive livestock operations, mainly due to a lack of manure storage facilities with, in the late 1990s, over 90% of manure waste discharged without treatment [28], and low rates of uptake of nutrient management plans or soil nutrient testing [11]. These problems are partly linked to the lack of capital, on the part of both farmers and government, to invest in manure storage and other manure treatment technologies; and also to inadequate knowledge of nutrient management practices. With the depletion of phosphate levels in soils over most of the period since the early 1990s, confirming a process of soil mining of P, although this does not pose an environmental threat to water quality it could impair crop P nutrition and yields over the long term [26, 27].

The 60% decrease in pesticide use was the highest across OECD countries from 1990-92 to 2001-03. The reduction in support to pesticides and crops during the transition period explains much of the decrease in pesticides use. Its use declined from around 35 000 tonnes (of active ingredients) in the late 1980s to below 6 000 tonnes by the mid/late 1990s, then rising to nearly 7 400 tonnes by 2001-03. Lower pesticide use can also be explained, to a limited extent, by the expansion in organic farming and adoption of integrated pest management (IPM). Even though ***organic farming*** grew rapidly over the 1990s, but by 2002-04 it accounted for only about 2% of agricultural land compared to the EU15 average of nearly 4% [11, 29, 30], while the area under IPM was less than 1% of the total arable and permanent crop area in 2003. With the sharp cut in pesticide use over the 1990s, the pressure on water quality was lowered, but the rise in use since the late 1990s has led to some concerns for water pollution [31].

Water management in agricultural areas is important due to the increasing incidence and severity of floods and droughts. Two-thirds of agricultural land (over 50% of the total land area) is endangered by flooding, and protection against flood damage has played a key role in farm management practices over many years, especially in the Tisza and lower Danube valleys [1, 19]. Some 10-15% of arable land is regularly flooded, sometimes between 2-4 months a year, although a network of drainage canals and reservoirs have been established to minimise damage [19]. As agriculture is largely rain-fed, use of irrigation is limited, accounting for 2% (2001-03) of the total farmland area. Agriculture's share in national water use was 13% in 2001-03, although agricultural water use declined by over 30% between 1990-92 and 2001-03, partly because of the nearly 40% reduction in area irrigated over this period.

There has been a sharp reduction in air pollution linked to agriculture. Agricultural ***ammonia emissions*** decreased by 34% between 1990-92 and 2001-03, among the largest reductions across OECD countries. Farming accounted for nearly all ammonia emissions in 2001-03, with the drop in emission levels mainly due to the reduction in livestock numbers and nitrogen fertiliser use. With total ammonia emissions falling to 66 000 tonnes by 2001-03, Hungary has already achieved its 2010 target of 90 000 tonnes required under the *Gothenburg Protocol*. Further reductions in ammonia emissions could be achieved if poor manure storage and fertiliser spreading practices were improved [11]. For ***methyl bromide*** use (an ozone depleting substance) Hungary has almost eliminated its use: from 32 tonnes (ozone depleting potential) in 1991 down to 2 tonnes in 2004, as agreed by the phase-out schedule under the *Montreal Protocol* which sought to eliminate all use by 2005.

Agricultural greenhouse gas (GHG) emissions decreased by 35% from 1990 to 2002-04. This reduction compares to an overall decrease across the economy of 32%, and a commitment under the *Kyoto Protocol* to reduce total emissions by 6% over 2008-12. Agriculture's share of total GHGs declined to 13% by 2002-04. Much of the decrease in agricultural GHGs was due to lower livestock numbers (reducing methane emissions) and reduced fertiliser use (lowering nitrous oxide emissions) [18]. Projections suggest that agricultural GHG emissions will rise in the period from 2003-05 to 2008-12, as the farming sector expands following entry into the EU. Even so, agricultural GHG emissions are projected by 2008-12 to remain below their level of the early 1990s [18]. The decrease in the area under pasture over the period 1990 to 2003 has led to a reduction in ***soil carbon*** [18], but the planned afforestation of farmland under the *National Afforestation Programme* up to 2050 could increase carbon sequestration.

The agricultural sector has also contributed to lowering GHG emissions by reducing its on-farm energy consumption, but also by expanding renewable energy production. ***On-farm energy consumption*** decreased by 34% between 1990-92 and 2002-04 compared to a reduction of 2% for total national energy consumption, with farming contributing only 3% of total energy consumption. The overall reduction in agricultural production and energy support largely explains the decrease in energy consumption by farming, while higher energy prices have encouraged an improvement in farm energy use efficiency [32]. ***Renewable energy production*** from agricultural and other biomass feedstocks, including farm forestry, is being expanded but remains under 2% of total primary energy supply [20, 33]. Agricultural biomass provides feedstock for power, energy (biogas) and liquid fuel production (biodiesel and bioethanol), with one bioethanol plant using maize and other cereals producing 65 million litres annually, with considerable capacity to increase the use of agricultural biomass [20, 33, 34].

Evaluating the effects of agriculture on biodiversity since 1990 is complex. This is because of the inheritance from the previous centrally planned economy, which promoted intensive farming practices, including increased drainage and irrigation, leading to widespread damage to biodiversity and cultural landscapes [11, 14]. Over the 1990s the pressure on biodiversity rapidly diminished, especially with the reduction in the use of fertilisers and pesticides [22, 28]. But farming is now characterised by a dual structure of large corporate enterprises and small family farms, which have varying impacts on biodiversity: the smaller farms are commonly associated with less intensive production of potential benefit to biodiversity compared to corporate farms [14, 19, 35]. For example, small remnants of extensive farming systems persist, such as shepherding in the flats of the Great Plain and extensive fruit and grassland farming in the Orség region [11]. Even so, on both small and large farms the uptake of farming practices to help protect biodiversity is low, and investment in environmental protection is poor (*e.g.* manure storage).

In terms of agricultural genetic resources, there are* in situ *programmes and* ex situ *collections of agricultural genetic material [24, 36]. Crop varieties and livestock breeds used in production have increased in diversity. *In situ* regeneration of field crop and vegetable landraces are conducted under contract with farms in four to six ecologically different regions, with the number of landraces registered varying from 400 to 600 annually [24].

Research suggests that many small family farms and home gardens in rural areas are providing an ecosystem service by conserving *in situ* crop genetic resources [36, 37]. For livestock breeds there is little information on *in situ* or *ex situ* conservation programmes or the state of endangered breeds.

As agriculture is the major land user this has important implications for biodiversity. Nearly two-thirds of the country is farmed, among the highest share across OECD countries. Moreover, about 10% of the total land area is under nature protection, of which around 40% is farmed [11], including the extensively cultivated vineyards of the Tokaj region, a UNESCO *World Heritage Site* [38]. Of concern for wildlife habitat has been the nearly 8% reduction in farmland during 1990-92 to 2002-04, in particular, the conversion of ***semi-natural grassland*** to other land uses, mainly forestry. Conversion of farmland to forestry can involve both costs and benefits for biodiversity, especially by changing the mix of wildlife. In the late 1990s semi-natural grasslands, a habitat rich in wildlife including some endangered species such as the Corncrake (*Crex crex*) and Great Bustard (*Otis tarda*), accounted for around 15% of all farmland [14]. Increasingly, however, semi-natural grasslands are becoming fragmented, and the valued "puszta" landscapes are disappearing. The "puszta" landscape consists of a mix of dry steppes, wet meadows, alkali marshes, small wooded patches and small farms [11, 39].

Bird species are under threat not only from loss of agricultural habitats, but also because of changes in their management. Changes in farming practices towards more intensive methods, such as switching from hay to silage production; altering the timing of mowing grass for hay; and varying cropping patterns and rotations; have been detrimental to endangered birds such as the Corncrake and Great Bustard [11, 38, 39, 40]. In the late 1990s farming is estimated to have posed a threat to over 45% of important bird habitats through intensification and land use changes [41]. Nevertheless, given the more extensive system of farming in Hungary, compared to most regions of the EU15 over the 1990s, this has had a less harmful impact on biodiversity. For example, over the 1990s many birds which have bred relatively successfully in Hungary have declined in numbers in many EU 15 countries, such as the Skylark (*Alauda arvensis*), Corn Bunting (*Embrerisa calandra*) and Stonechat (*Embreriza citrinella*) [38, 39]. Other research has also shown a link between growing intensification of farming practices and declining wildlife. The numbers of two farmland game species, the Brown Hare (*Lepus europaeus*) and the Grey Partridge (*Perdix perdix*), have been in decline over many decades, although numbers stabilised over the 1990s [42]. Similarly the near extinction of the Meadow Viper (*Vipera ursinii rakosiensis*) is closely linked to the severe reduction and fragmentation of grassland meadows [43].

3.11.3. Overall agri-environmental performance

Overall agricultural pressure on the environment has been reduced since 1990. The transition to a market economy has resulted in a more extensive farming system, leading to a decrease in the use of purchased farm inputs (fertilisers, pesticides, energy and water) and water and air pollution. With the slight rise in farm input use since the late 1990s, however, concern over water pollution has grown in some regions. Even so, by 2005 farm input use remained below its peak of the late 1980s. Soil degradation, especially soil erosion, remains a widespread problem [11]. With respect to biodiversity, concerns relate to the conversion of agricultural habitats rich in wildlife (*e.g.* semi-natural grasslands) to other land uses, and in some cases the uptake of more intensive farm management practices on these habitats [11, 14, 19].

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The agri-environmental information system does not fully provide the information required to effectively monitor and evaluate agri-environmental performance and policies. Government and relevant research institutions have been impeded by a lack of resources to improve data collection systems during the transition period. However, a stronger economy together with funding from the EU is beginning to help strengthen the agri-environmental monitoring system. Projects financed under PHARE, for example, are seeking to improve the monitoring system to assess the extent of water pollution from agriculture [11, 19]. Since 2004 under the *Less-favoured Areas* and agri-environmental schemes of the NAEP [5] one of the eligibility criteria is that every farmer has to record a register booklet (*Farm Management Record*), which contains much information relevant to agri-environmental performance and evaluation. The Agricultural Office has begun to process this database within the framework of the *Agri-environmental Information and Monitoring System* (AIMS), established by the Ministry of Agriculture and Rural Development in 2005. As agri-environmental schemes are expanded, this information will be important to help evaluate the effectiveness of these schemes.

Agri-environmental policies have been strengthened in the period since EU membership. Around 4% of farmland was included under the former *National Agri-environmental Programme* in 2003 [15], and the target for the *National Rural Development Programme* over 2004-06 is to achieve an uptake of land under agri-environmental schemes equivalent to over 10% of agricultural land (Figure 3.11.4) [11]. Given the extent of the soil erosion problem across Hungary, policy emphasis has focused on this issue, although policies to address agri-biodiversity issues are less well developed and this area needs to be strengthened, especially as much agricultural land continues to support a relatively rich and abundant wildlife compared to most EU15 countries [38, 39]. The *National Afforestation Programme*, which is seeking to expand the area forested from 20% in 2005 to 27% of the total land area by 2050, has important implications for agriculture as 80% of the planned new tree plantings would be on farmland. This programme has the potential to bring a number of environmental benefits, such as reducing soil erosion and pollutant run-off from farmland, and increase carbon sequestration to capture GHG emissions. However, only 44% of the planned new forest plantings under the Programme were established over the period 1991 to 2000 [11], while there are also concerns for afforestation of some marginal farming areas that are important for supporting wildlife, such as semi-natural grasslands.

While pressure from farming on the environment has been much reduced, problems still persist. To reduce soil degradation, especially ***soil erosion***, it will be important to increase the uptake of soil conservation practices, such as greater adoption of conservation tillage, continuous soil cover and establishing lines of trees and hedges against wind erosion [11]. More widespread adoption of soil conservation practices would not only bring benefits in reducing soil degradation, but also help toward reducing diffuse pollution and damaging impacts on biodiversity [40]. ***Agricultural pollution of water and air*** has been greatly improved, mainly as a result of the decrease in use of purchased farm inputs and despite a slight increase in input use since the late 1990s. By 2005 input use remained considerably below the peak of the late 1980s [13, 15]. But in some regions problems of pollution remain largely associated with large-scale intensive livestock operations, mainly due to a lack of investment in manure storage facilities and the low adoption rates, and inadequate knowledge, of nutrient management plans [11, 28]. Some support for farm use of energy and water inputs remains. ***Tax exemptions*** on fuel used by farmers provide a disincentive to improve energy efficiency and help further reduce greenhouse gas emissions, although agriculture has reduced its GHG emissions, energy use and increased renewable energy production. Moreover, support for irrigation infrastructure does not provide incentives to conserve water resources, even though farmers pay a groundwater abstraction fee [17].

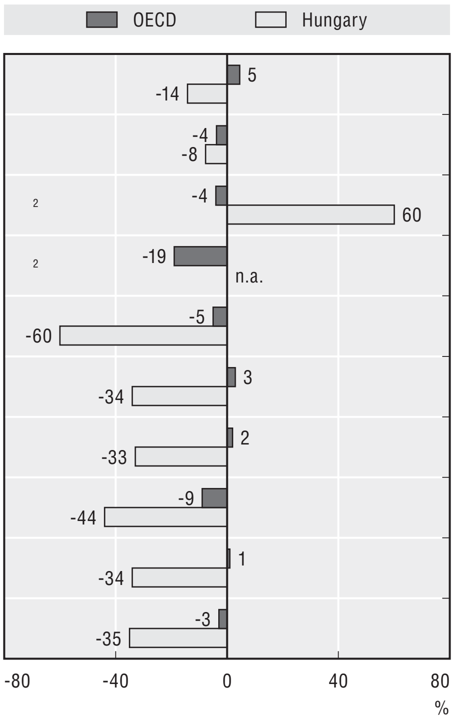
The pressure on biodiversity has eased as the intensity of farming has decreased, with numerous birds breeding successfully in Hungary relative to declining numbers in many EU15 countries. But land fragmentation and cessation of farming has been damaging to wildlife in some areas [11, 14, 38, 39]. The uptake of farming practices beneficial to wildlife is not widespread, although research suggests that many small family farms and home gardens in rural areas are providing ecosystem services by conserving *in situ* crop genetic resources and adopting extensive farming practices [36, 37]. Under the 2nd *National Environment Programme*, however, greater emphasis is being placed on biodiversity and landscape conservation, including for agriculture.

With the projected expansion of agricultural production from 2005 to 2015 the pressure on the environment could increase [18, 44]. The recent changes of CAP Reforms together with EU enlargement could lead to an increase in wheat and coarse grains production (but reduction in the area under these crops); and contraction in livestock output, notably dairy and beef up to 2010 [44, 45]. As a result there could be an overall rise in farm incomes and production concentrated on fewer farms [5]. These trends suggest further agricultural intensification, especially for cereals (higher production on a smaller area), although even by 2015 the Hungarian farming system is likely to be less intensive overall than in most EU15 countries.

 ENVIRONMENTAL PERFORMANCE OF AGRICULTURE IN OECD COUNTRIES SINCE 1990 – ISBN 978-92-64-04092-2 – © OECD 2008

Figure 3.11.2. **National agri-environmental performance compared to the OECD average**

Percentage change 1990-92 to 2002-04[1]



Absolute and economy-wide change/level

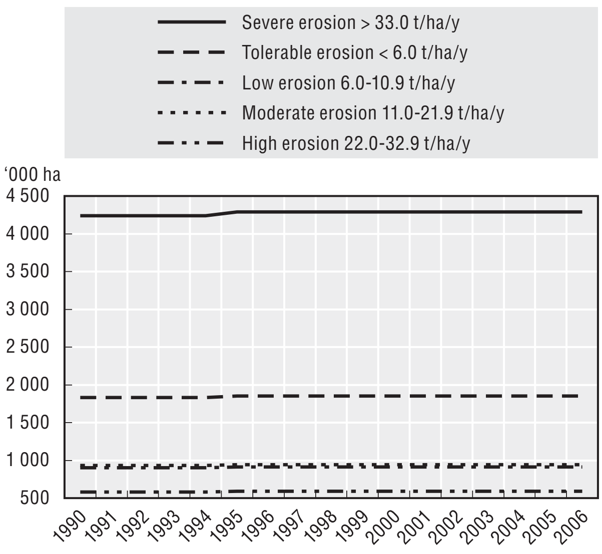
Variable	Unit		Hungary	OECD
Agricultural production volume	Index (1999-01 = 100)	1990-92 to 2002-04	86	105
Agricultural land area	000 hectares	1990-92 to 2002-04	–491	–48 901
Agricultural nitrogen (N) balance	Kg N/hectare	2002-04	37	74
Agricultural phosphorus (P) balance	Kg P/hectare	2002-04	–1	10
Agricultural pesticide use	Tonnes	1990-92 to 2001-03	–11 159	–46 762
Direct on-farm energy consumption	000 tonnes of oil equivalent	1990-92 to 2002-04	–325	+1 997
Agricultural water use	Million m^3	1990-92 to 2001-03	–338	+8 102
Irrigation water application rates	Megalitres/ha of irrigated land	2001-03	1.2	8.4
Agricultural ammonia emissions	000 tonnes	1990-92 to 2001-03	–34	+115
Agricultural greenhouse gas emissions	000 tonnes CO_2 equivalent	1990-92 to 2002-04	–5 782	–30 462

n.a.: Data not available. Zero equals value between –0.5% to < +0.5%.

1. For agricultural water use, pesticide use, irrigation water application rates, and agricultural ammonia emissions the % change is over the period 1990-92 to 2001-03.
2. Percentage change in nitrogen and phosphorus balances in tonnes.

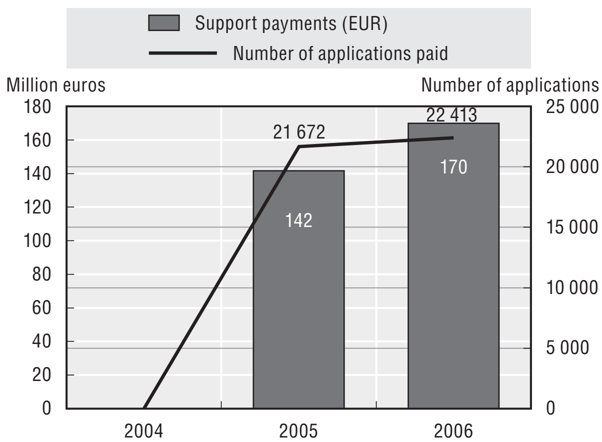
Source: OECD Secretariat. For full details of these indicators, see Chapter 1 of the *Main Report*.

Figure 3.11.3. **Agricultural land affected by various classes of water erosion**



Source: Plant and Soil Protection Unit, Hungarian Ministry of Agriculture and Rural Development.

Figure 3.11.4. **Support payments for agri-environmental schemes and the number of paid applications**



Source: Report on the implementation of the National Rural Development Plan of Hungary in 2006, Ministry of Agriculture and Rural Development.

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