



Report 2007:32



COUNTY ADMINISTRATIVE  
BOARD OF STOCKHOLM

## **Agri-environmental extension services in Estonia, Latvia, Lithuania and Poland**



**Author:**  
Annika Henriksson

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## Preface

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This report presents the results of a study on agri-environmental extension services in Estonia, Latvia, Lithuania and Poland. Agri-environmental extension services can be defined as the organized exchange of information and the purposive transfer of skills to farmers with the aim to reduce undesirable negative environmental impacts. The study was conducted as a part of a recent Swedish initiative that tries to raise the Baltic Sea region focus upon such services. They may serve as a cost-effective and necessary instrument to improve the environmental status of the region's freshwaters and eventually in the Baltic Sea itself.

The study takes as a point of departure that agri-environmental extension services are carried out in all countries surrounding the Baltic Sea, and that there is currently a will and interest to enhance and expand such services. This is increasingly being promoted by several EU environmental directives, agricultural policy and support mechanisms and recently in the HELCOM Baltic Sea Action Plan. While giving focus to agri-environmental extension services of the four countries concerned, the report places such activities in a wider context as defined by the agricultural sector and overall extension services.

The study was commissioned by small groups of Swedish actors involved in agri-environmental extension services - the Swedish Board of Agriculture, the Federation of Swedish Farmers, and the County Administrative Boards of Scania and Stockholm, respectively, with the latter as co-ordinator. The study was part-funded by the Baltic Sea Unit SIDA. The study was conducted and reported by Annika Henriksson, Agellus Consultants, during the autumn 2007 with support from Stefan Pietrzak, Institute of Water Management and Grasslands, Poland, Rafał Rzepkowski, Central Agricultural Advisory Organisation, Poland, Rimas Magyla, Lithuanian Agricultural Advisory Service, Kaspars Zurins and Maija Sirvide, the Latvian Rural Advisory and Training Centre, Hannes Aamisepp, Rural Economy Research Centre, Estonia, and Hanna Kreen, Ministry of Agriculture, Republic of Estonia.

Stockholm, December 2007



Lars Nyberg

Director Environment and Planning Department



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# 1. Summary

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This study describes the agricultural extension service in Estonia, Latvia, Lithuania and Poland, with the focus on the agri-environmental advisory service. The study was commissioned by the County Administrative Board of Stockholm and presented at an international expert and policy seminar in Riga in December 2007. Data were collected mainly with the help of key persons in advisory organisations in the respective countries but also from statistical databases, official reports and other documents and from personal contacts.

Statistics show that agricultural production in all four countries has increased in the last eight years in absolute terms, but the significance of the industry is decreasing in terms of total workforce and gross value added of agricultural products. The total load of nitrogen and phosphorus to the Baltic Sea is decreasing for Poland but there is no monitoring showing that the losses from agriculture have decreased. For the other countries there is no clear trend for total nutrient load to the Baltic Sea but there is monitoring, although limited, showing increased losses in areas with intensive agriculture due to increased use of fertilisers and cultivation of formerly abandoned land or pasture land.

The EU Nitrate Directive is a strong driving force for change in agricultural practices and many information activities on nutrient management and the legal requirements have been provided by the respective national advisory services for agricultural producers.

The Rural Development Programme (RDP) 2007-2013 provides direct support for agricultural extension services, including specific support for environmental advisory services. However, there should be no doubt that the most important task of the advisory service has been, and for the foreseeable future will continue to be, helping agricultural producers to make use of the different EU funds for modernisation. This is a very strong driving force in all the countries and it may not in itself result in reduced environmental impact. The 'only' significant economic incentives to reduce the environmental impact of agriculture are the support for investment in more environmentally friendly technology, i.e. improved manure storage, together with the environmental obligations connected with support within RDP.

All beneficiaries of RDP are obliged to follow Good Agricultural Practice and all the agri-environmental programmes require fertiliser plans and other environmentally friendly practices. In the near future, there will be a need for experts in nutrient management in a broad sense, as well as experts in the handling of plant protection products. Furthermore, due to the cross-compliance regulations, advisory services will be required on environmental regulations including animal welfare and this is particularly stressed by the producers' organisations. Organic farming is a priority area where there is a

need for advisors and there will be a continued need for experts in agricultural engineering/building. In Latvia, Lithuania and Poland there are established national advisory organisations but in Estonia the co-ordination of the advisory service is still under construction.

In the longer-term perspective, large livestock producers will need help in implementing the environmental assessment and the environmental permit process required by the Integrated Pollution Prevention and Control (IPPC) Directive.

## 2. Introduction

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A number of international agreements, EU directives, the EU rural development programme and the cross-compliance mechanism call for actions on the environmental problems resulting from agricultural production.

This report describes a study on the current organisation of agricultural extension services in Poland, Estonia, Latvia and Lithuania. Emphasis is placed on agri-environmental extension services. Among the issues of concern of the study are views on future needs and possible improvements of agri-environmental extension services. The study was commissioned by a Swedish consortium headed by the County Administrative Board of Stockholm, with representatives from the Swedish Board of Agriculture, the Federation of Swedish Farmers and the County Administrative Board of Scania as other members. Funding for the study was provided by the Sida (Swedish International Cooperation Development Agency) Baltic Sea Unit.

The report was presented at the international Baltic Sea Region expert/policy seminar on agri-environmental extension services held in Riga in December 2007. This seminar was first announced by the Swedish Minister of Agriculture, Mr. Eskil Erlandsson, at the joint Council of the Baltic Sea States (CBSS) agricultural and environmental high-level meeting held in Sweden in April 2007. The seminar was organised as a joint venture between Swedish and Latvian partners, including the Latvian Ministries of Agriculture and Environment, with the County Administrative Board of Stockholm as co-ordinator.

The target group for the seminar and for this report include national experts and decision-makers who are developing and providing agri-environmental extension services in the CBSS/Helcom countries.

### 3. Statistical information on all four countries

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#### 3.1 Environmental maps

Environmental maps for the Baltic Sea catchment area are presented in Figs. 1-4.

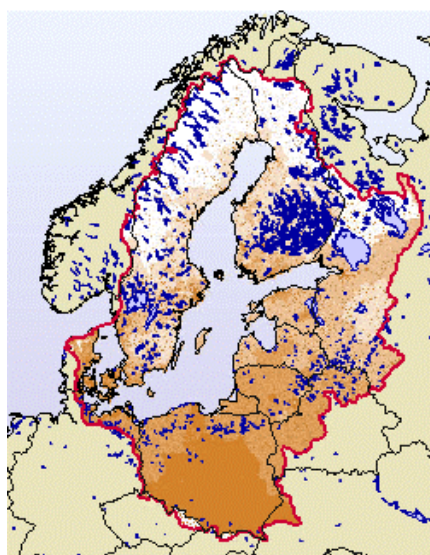


Fig. 1. Population density.

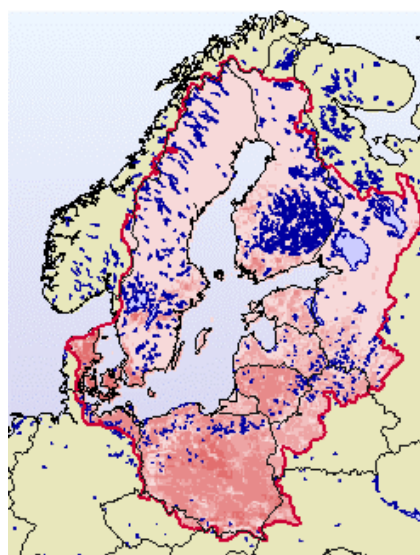


Fig. 2. Arable land.

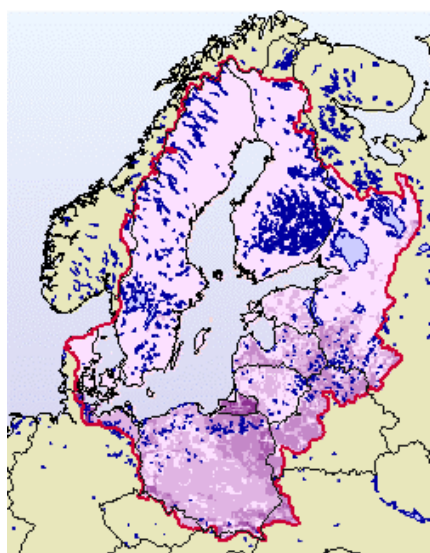


Fig. 3. Pasture land.

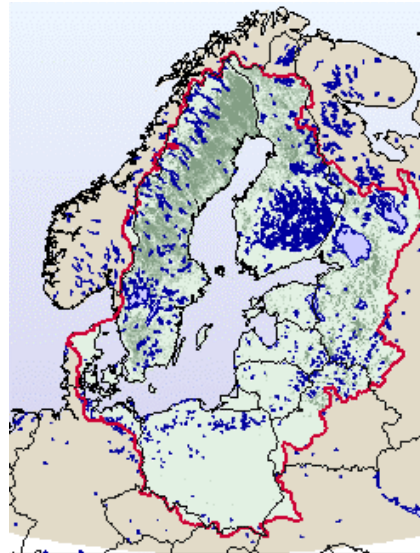


Fig. 4. Wetlands.

Source: *Baltic Environmental Atlas, UN Environment Programme/GRID-Arendal. Online 2007-11-07.*

### 3.2 Production

It should be stressed that the countries are very different as regards size in general and particularly as regards size of agricultural production. The total population (Table 1) of Poland is 11 times larger than that of the second largest country (Lithuania) and Poland is between 4.2 and 9.7 times larger as regards all physical categories in agriculture reported on compared with Lithuania, again the second largest country. The growth rate of GDP per capita is shown in Fig. 5.

Table 1. Population, employment rate and unemployment rate

	Population 2007	Employment rate 2006 (%)	Unemployment rate 2006 (%)
Estonia	1 342 409	68.1	5.9
Latvia	2 281 305	66.3	6.8
Lithuania	3 384 879	63.6	5.6
Poland	38 125 479	54.5	13.8

Source: Eurostat.

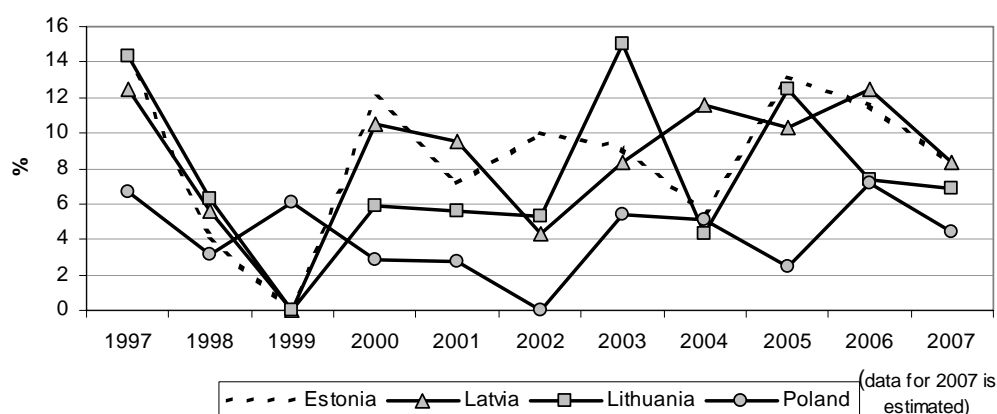


Fig. 5. Growth rate of GDP per capita in the countries studied.

Source: Eurostat.

In all four countries, the gross value added for agriculture as a percentage of the total economy is decreasing, but it is still higher than the EU average. The total workforce in agriculture, counted as annual works units, is decreasing in all four countries (Table 2).

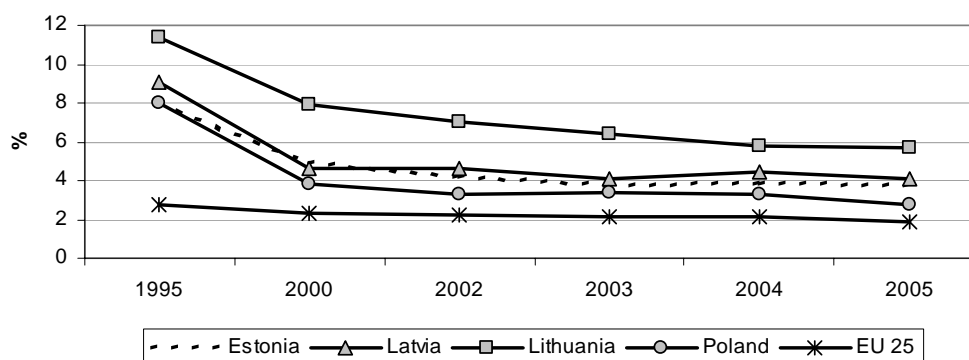


Fig. 6. Gross value added of agricultural products at basic prices as per cent of total economy in the countries studied.

Source: Eurostat.

Table 2. Total workforce in agriculture (annual works units, thousands)

	1995	2000	2005
Estonia	70	65	38
Latvia		149	136
Lithuania		187	151
Poland		2 495	2 292

Source: Eurostat.

The number of holdings in Poland in 2005 was ten times as many as in Lithuania and 100 times as many as in Estonia. In all the countries except Estonia, more than 99 per cent of the total number of holdings were held by individual farmers. In Poland, farmers are significantly younger than in the other countries (Table 3).

The smallest farms, which account for less than 1 per cent of the agricultural activity in the respective countries, are not included. The size group less than 5 hectares is the largest in all the countries, in Poland it is more than 71 per cent and in Lithuania 51 per cent of the total number of holdings.

Table 3. Total number of holdings, holdings owned by individual farmers and the percentage of individual farmers less than 35 years of age and over 65 years of age in Poland, Lithuania, Latvia and Estonia respectively in 2005

	Total	Individual farmers	%	< 35 years	%	> 65 years	%
Poland	2 476 470	2 472 830	99.9	313 350	13	421 950	17
Lithuania	252 950	252 400	99.8	13 190	5	80 660	32
Latvia	128 670	128 550	99.9	9 850	8	36 930	29
Estonia	27 750	26 870	96.8	1 840	7	7 990	30

Source: Eurostat.

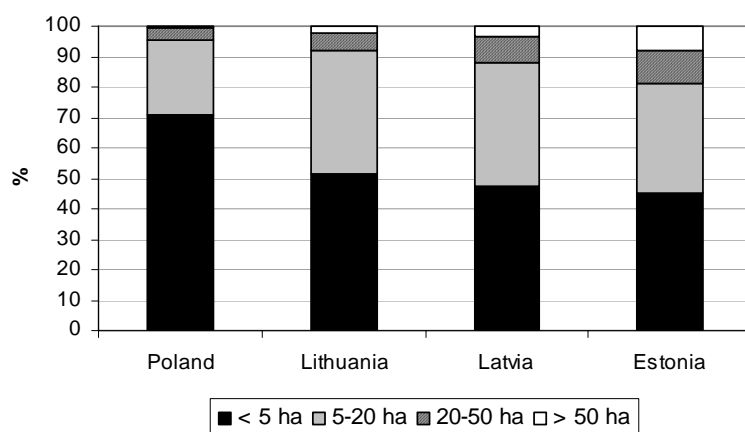


Fig. 7. Percentage of agricultural holdings in different size groups in Poland, Lithuania, Latvia and Estonia, 2005.

Source: Eurostat.

A noticeable feature in Table 4, apart from the big difference in the agricultural area between Poland and the other countries, is that up to today about 4 per cent of the total agricultural land is owned by the state. The total area of organic crops in Poland, fully converted to fulfil all the conditions of the EU Regulation on organic crops, is rather small in comparison with the area of arable land. The data on organic crop area are from different sources, which is the reason why the percentage of organic area of the total area of arable land has not been calculated but in rough terms, the share of organic crops is less than 1 per cent in Poland, 1-2 per cent in Latvia and Lithuania and over 7 per cent in Estonia. However, the area of organic crops is rapidly increasing and all the countries have at least as much land under conversion as the area fully converted.

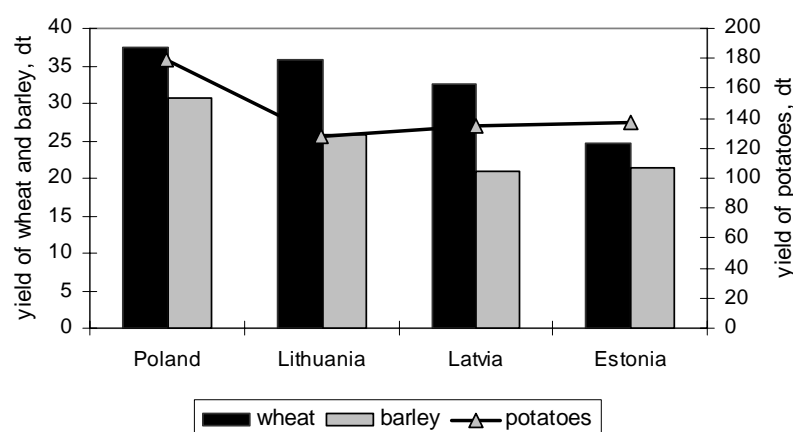


Fig. 8. Yields of wheat, barley and potatoes (dt/ha).

Sources: GUS. Rolnictwo w 2006 r. Warsaw 2007, Statistics Lithuania, Database of Indicators, Latvijas Statistika, website, database, tables, Eesti Statistika. Website. Statistical databases.

Table 4. Land use and legal type of holder, in 2006 (if not otherwise indicated)

	Total agricultural land	In private sector	Arable land	Permanent grassland	Cereals (sown area)	Organic crop area (fully converted)
	1 000 ha	%	1 000 ha	1 000 ha	1 000 ha	1 000 ha
Poland	15 927	96	12 357	3 216	8 381	37,7**
Lithuania	3 482*	100	2 927*	497*	963	30,5
Latvia	1 855	na	1 205	637	512	20,7*
Estonia	829*	100	584*	237*	284*	44,9*

Sources: GUS Central Statistical office, regional databank, website, database, Statistics Lithuania, Database of Indicators, Latvijas Statistika, website, database, tables, Eesti Statistika. Website. Database, tables (land use and legal type of holder), and Eurostat, website, database (organic crop area).  
\* = year 2005, \*\* = year 2004, na= not available

As an example of productivity, the yields for different crops are shown in Fig. 8. The fact that the yields in Poland are slightly higher for all crops contradicts the general opinion in Poland that the natural conditions for agriculture are worse in Poland than in other European countries (see Chapter 10 Poland).

For Lithuania, Latvia and in particular Estonia, there has been a significant increase in total wheat production but for Poland production has been rather stable in the last ten years. Crops are the most important output of Estonian agriculture.

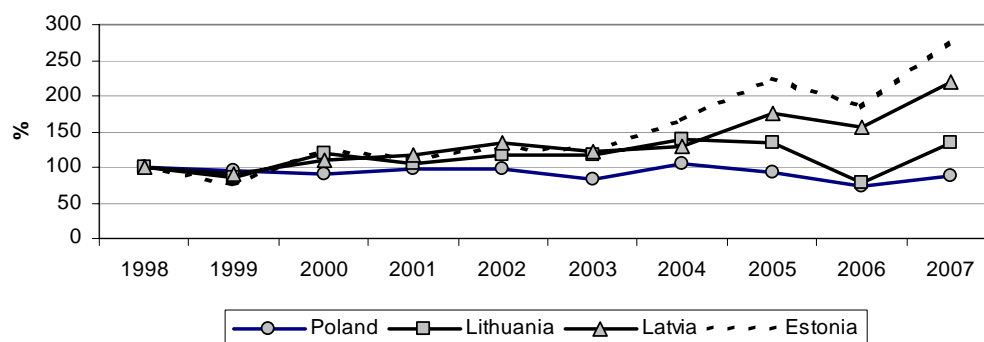


Fig. 9. Production of wheat as percentage of production in 1998.

100 = Total production in 1998 (1 000 tonnes) - Poland: 9 537, Lithuania: 1 031, Latvia: 385, Estonia: 118.

Source: Eurostat.

Data are not available for all the different kinds of livestock in all the countries. The total milk production is not the same as milk collected, as total production also includes milk used on the farm (Table 5).



Table 5. Number of dairy cows, total milk production, number of suckler cows, number of breeding sows and number of fattening pigs in 2006

	Dairy cows <sup>(1)</sup> thousands	Milk production 1000 kg	Milk yield <sup>(1)</sup> kg/cow	Suckler cows thousands	Breeding sows thousands	Fattening pigs thousands
Poland	2 637	11 633 391	4 200	47	1 786	6 340
Lithuania	416	1 561 200	4 176	na	na	na
Latvia	182	815 100	4 492	8.2	29	157
Estonia	108	692 000	6 285	6	37	112

<sup>1)</sup> The sources for the milk yield are GUS, Agriculture 2006; RDP 2007-2013 for Lithuania and Latvia respectively and Eesti Statistika. Website. Statistical databases.

Sources: GUS website; Statistics Lithuania, Database of Indicators; Latvijas Statistika, website, database, tables; Eesti Statistika. Website. Statistical databases. Agricultural farms of Latvia 2006, Central Statistical Bureau of Latvia, Rīga, 2007, 44p.

Total collection of milk (Fig. 10) decreased in all the countries until around 2002 but recently the collection of milk is increasing again in all the countries. Milk is the most significant agricultural product in Latvia, and Latvia also has the sharpest increase in production, 67 per cent.

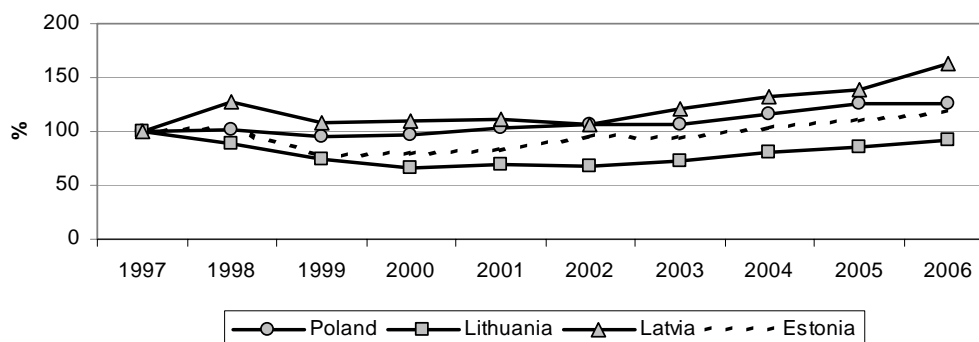


Fig. 10. Total collection of milk as percentage of production in 1997.

100 = Total production in 1997 (1 000 tonnes) - Poland: 7 037, Lithuania: 1 416, Latvia: 362, Estonia: 518.

Source: Eurostat.

The production of pig meat (Fig. 11) is increasing in all the countries except Latvia, most of all in Lithuania.

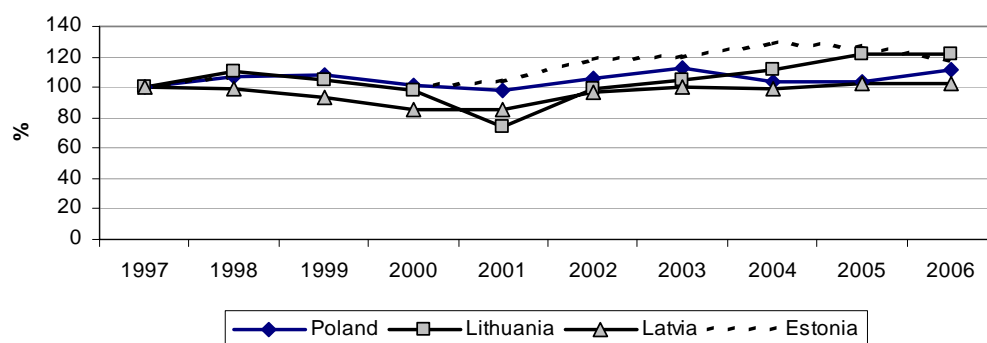


Fig. 11. Production of pig meat as percentage of production in 1997.

100 = Total production in 1997 (1 000 tonnes) - Poland: 1 862, Lithuania: 87, Latvia: 37, Estonia: 30.

Source: Eurostat.

### 3.3 Agriculture and environment

The most recent comparable data for all the countries are available from the HELCOM fact sheets but these only present the input from riverine, coastal, direct point and diffuse source inputs of total nitrogen and phosphorus and they are not apportioned to source. A common opinion is that diffuse sources are equal to agricultural sources, but diffuse sources also include surface runoff, soil erosion, nutrient leaching from the root zone, atmospheric deposition, rainwater composition and overflow and scattered dwellings. In the latest HELCOM compilation of data, the PLC-4 diffuse load contributed almost 60 per cent of the total nitrogen inputs and 50 per cent of phosphorus. The general decrease in total input of both nitrogen and phosphorus, which can be seen in Figs. 12 and 13, is mainly due to a decreased discharge from point sources. Poland also has the highest total input to the Baltic Sea of nitrogen and phosphorus. However, there has been a clear decrease in total nitrogen input from all the countries except Estonia since 1998. As for phosphorus there has been a clear decrease in input from Poland and Lithuania since 1998, whereas there is no such tendency for Latvia and Estonia.

The livestock density counted as number of livestock units (LU) per hectare decreased slightly in all the countries from 2003 until 2005 (Fig. 14). Data based on the same conversion method for all countries were not available before 2003.

There are no recent data on total use of pesticides or fertiliser N, P and K for all countries. Information on the individual countries is included in the respective chapters if available.

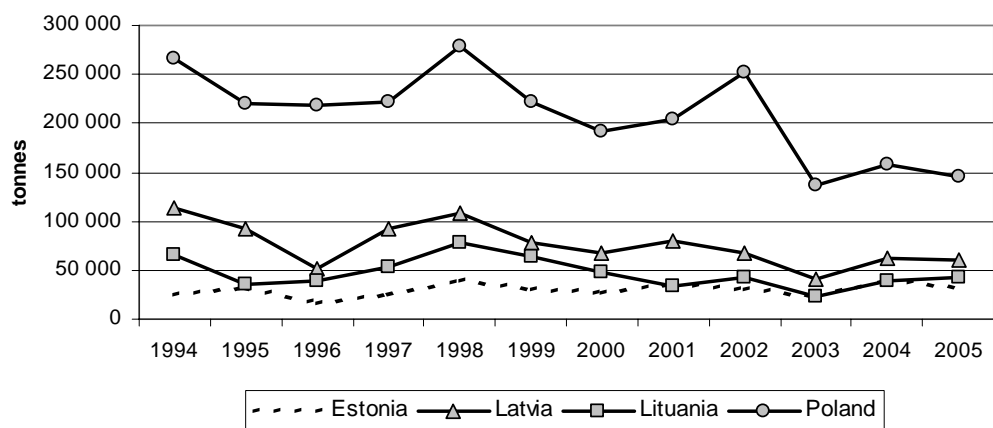


Fig. 12. Riverine, coastal and direct point and diffuse source inputs of N-tot to the Baltic Sea in 1994-2005 (tonnes).

Source: Seppo Knuuttila, 2007. Waterborne loads of nitrogen and phosphorus to the Baltic Sea in 2005. HELCOM Indicator Fact Sheets 2007. Online 2007-11-07.

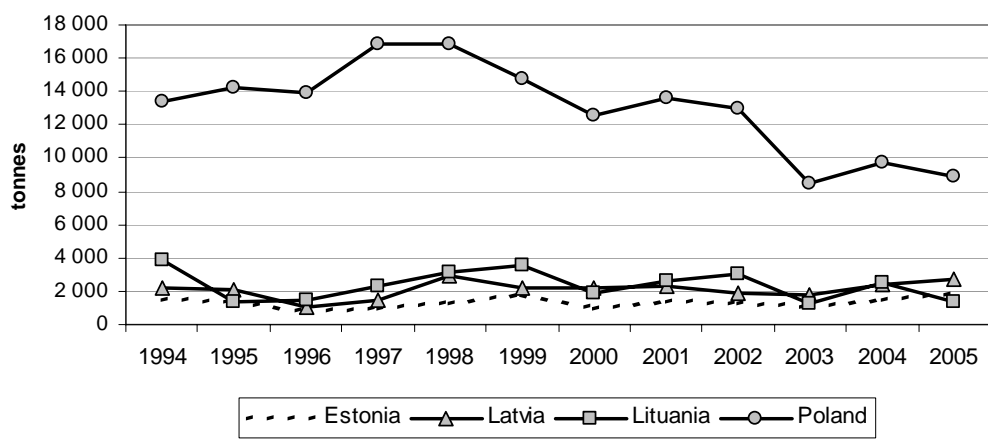


Fig. 13. Riverine, coastal and direct point and diffuse source inputs of P-tot to the Baltic Sea in 1994-2005 (tonnes).

Source: Seppo Knuuttila, 2007. Waterborne loads of nitrogen and phosphorus to the Baltic Sea in 2005. HELCOM Indicator Fact Sheets 2007. Online 2007-11-07.

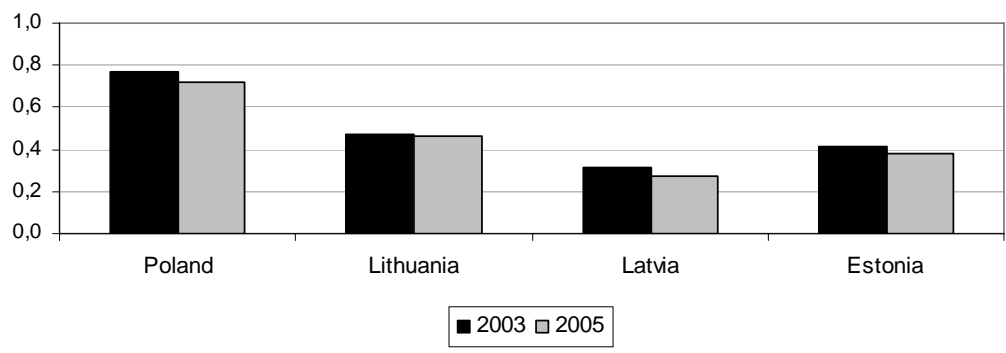


Fig. 14. Livestock density in 2003 and 2005.

Source: Eurostat.

## **4. Other information on all four countries**

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### **4.1 Method of work and collection of information**

The information in this study was obtained from literature, reviews of laws and regulations and other official documents and websites according to the reference list at the end of the report. Statistical information was obtained from the official databases of the national statistical offices of the respective countries and from Eurostat.

Most important was the information from the following persons:

- Stefan Pietrzak, Institute of Water Management and Grassland Farming at Falenty.
- Rafał Rzepkowski, Central Agricultural Advisory Organisation at Brwinow.
- Rimas Magyla, Lithuanian Agricultural Advisory Service at Akademia.
- Kaspars Zurins and Maija Sirvide, the Latvian Rural Advisory and Training Centre at Ozolnieki.
- Hannes Aamisepp, Rural Economy Research Centre at Jäneda, Estonia.
- Hanna Kreen, Ministry of Agriculture, Republic of Estonia.

From actors outside the national advisory service, there were a few responses from producers' organisations. The reason is probably language problems. Most of the farmers' and producers' organisations in the countries were contacted by e-mail using information provided by:

- the Polish Pig Producers' Organisation POLSUS,
- the Polish Sugar Beet Growers Association and
- the Estonian Pig Breeding Association.

A meeting was held in October at the Polish Ministry of Agriculture with representatives from the Department of Planning and Analysis.

### **4.2 Opinions of international Non-Government Organisations**

#### **4.2.1 The Coalition Clean Baltic (CBB)**

The Coalition Clean Baltic, which represents 27 environmental members organisations from all the countries of the Baltic Sea Region, recently published a report on industrial swine and cattle farming. The organisation focuses on stricter legislation and implementation of the existing legislation

rather than on agri-environmental advisory activities, but some suggestions from this organisation either require, or can more easily be implemented with, the help of advisors.

The CCB requires a ‘balanced fertilisation scheme’ on farm level, meaning that imports and exports of nutrients (N, P, K) (from fodder and manure) on each farm must be balanced within the farm or within the close vicinity of the farm. The organisation suggests making fertilisation plans obligatory (and publicly available) for all industrial animal farms and furthermore based on the principle of the ‘balanced fertilisation scheme’. There is also a suggestion to have independent soil monitoring of the nitrogen content of farmland with high loads of manure.

The CCB focuses greatly on organic farming, especially the Polish member organisations.

#### **4.2.2 The World Wildlife Fund (WWF)**

The WWF reports in the Baltic Sea Scorecard that none of the countries around the Baltic Sea has successfully implemented the Nitrate Directive or the Water Framework Directive. The WWF demands much stronger actions against eutrophication, especially since HELCOM and NEFCO in a joint report predict that fertiliser use will increase by 25-30 per cent and pig production by 70 per cent by 2015.

#### **4.2.3 The Baltic Farmers’ Forum on the Environment (BFFE)**

The Baltic Farmers’ Forum on the Environment has recently suggested that the eutrophication problem should be solved using existing legislation, especially the Nitrate Directive, and focus on the actual implementation of these regulations. In addition they suggest agri-environmental support, an on-farm advisory service and voluntary market incentives and certification schemes such as EurepGap.

### **4.3 EU legislation**

#### **4.3.1 The IPPC directive**

The IPPC Directive 96/61/EC imposes upon farms with over 2 000 pigs weighing more than 30 kg, or 750 sows, an obligation to obtain an integrated permit. This obligation is to be fulfilled by new farms before operations begin, and by the existing farms according to the time schedule included in national regulations. Best Available Technology (BAT) as defined in specific national documents should be applied to all installations, including farms.

#### **4.3.2 Nitrate directive**

In all the countries studied there has been a systematic Europisation of environmental policy since the late 1990s and in this process national decision-makers have avoided placing excessive burdens on farmers. As the economic conditions have improved, the commercially orientated, privatised

farms are intensifying their production and increasing their impact on the environment.

Even if the Ministry of Agriculture in cooperation with the Ministry of Environment is responsible for implementing the EU Nitrate Directive, the Advisory Service, Environmental Inspectorates and regional or local authorities also play a role. The role of farmers and national agricultural organisations has been limited and there is a lack of knowledge in the farming community regarding the practical implications of future EU regulations.

In the earlier Rural Development Programmes, all four countries studied had activities called ‘meeting standards’, which to a large extent were intended to fulfil the requirements of the Nitrate Directive and this also applies for part of the SAPARD programmes, which are now closed. The introduction of GAP is also required in the Nitrate Directive.

#### **4.3.3 Cross-compliance**

Cross-compliance provisions are being implemented in Poland, Lithuania, Latvia and Estonia gradually and will be fully applied only when the amount of direct support reaches the EU-15 level. At present, this means that the regulations apply but not the sanctions.

#### **4.4 Incentives to reduce the environmental impact**

The only economic incentive to reduce environmental impact of agriculture is the support within the SAPARD/RDP. Real innovations concerning environmental improvements started in 2000 with SAPARD funds. There are no taxes on fertiliser or pesticides but in Estonia, Latvia and Lithuania there are taxes on use of raw material (aggregates). Environmental management systems on a commercial basis, i.e. technical environmental standards which agricultural producers need to comply with in order to get a better price or better market, do not occur in the agricultural industry other than in organic farming and GAP which is compulsory for agri-environmental support beneficiaries.

## 5. Rural Development Programmes

The total budget for RDP 2004-2006 and the agri-environment share is shown in Fig. 15. Estonia had by far the largest budget for agri-environment measures counted as share of total budget.

The Rural Development Programme for 2007-2013 is divided into four so-called 'axes' and each axis is divided into more specific 'measures'. The axes and measures that concern agri-environmental issues, including animal welfare, have been identified for this report.

It should be noted that the training and advisory in Measures 111 and 114 include activities targeted at forestry and food processing as well as agriculture. The activities also include training and advisory in other fields than the environment, which may not even be the main field. On the other hand, it could be argued that in Axis II there are other measures that could be called agri-environmental, such as Measure 213, support for agricultural land in the Natura 2000 areas and Measure 132, 'Participation of farmers in food quality schemes'.

The measure 121, 'Modernisation of agricultural holdings' includes investments in manure storage and handling but as one of many other possible investments which may not necessarily have any effect on the environment. Therefore, the budget for measure 121 is not included in the calculated total sums for agri-environment described below. It has not been possible, within the scope of this report, to specifically identify exactly the activities directed at the agri-environment in the different measures other than those named agri-environmental and animal welfare.

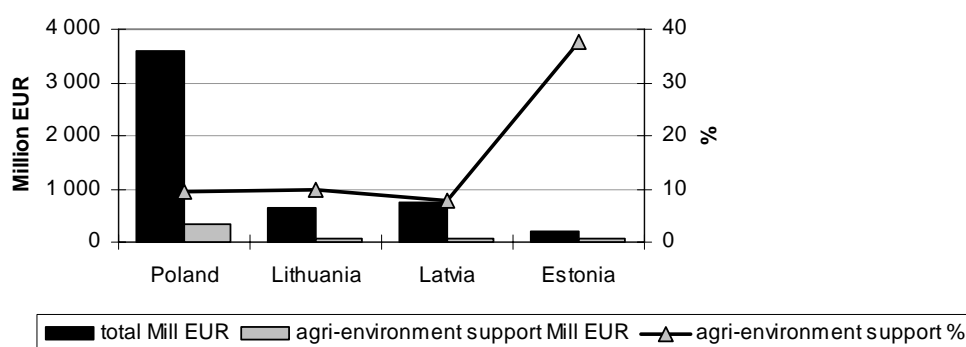


Fig. 15. Total budget for RDP 2004-2006 and budget for agri-environmental measures (million EUR).

Sources: The RDP programmes for 2004-2006 for Poland, Lithuania, Latvia and Estonia respectively.

- Axis I: Improving the Competitiveness of the Agricultural Sector
  - Measure 111: Vocational training and information actions
  - Measure 114: Use of farm and forestry advisory services
  - Measure 121: Modernisation of agricultural holdings
  
- Axis II: Improving the Environment and the Countryside
  - Measure 214: Agri-environmental programme
  - Measure 215: Animal welfare programme (only in Estonia).

The total funds for advisory and agri-environmental activities in Measures 111, 114, 214 and 215 are between 13 and 23 per cent of the total RDP 2007-2013 budget (Fig. 16). Although the measures cannot be compared easily with the measures in RDP 2004-2006, the share used for advisory and environmental purposes is slightly higher in the new Rural Development Plan with the exception of Estonia, which had a very high percentage for the environment even in the former plan. RDP 2004-2006 did not have specific funds for training and access to advisory services or, alternatively, this was not specified in the national documents.

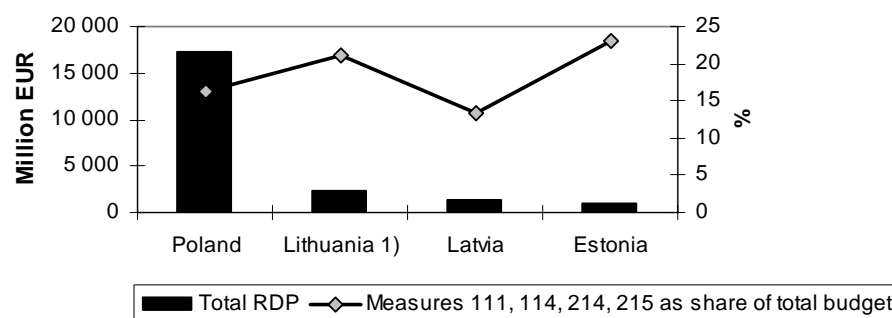


Fig. 16. The total RDP 2007-2013 budget (million EUR) and the percentage of Measures 111, 114, 214 and 215.

Sources: The Rural Development Programmes for 2007-2013 for Poland, Lithuania, Latvia and Estonia respectively.

The total funds for Measures 111, 114, 214 and 215, other measures in Axis II and the total budget in RDP 2007-2013 are shown in Table 6 and in Fig. 17.

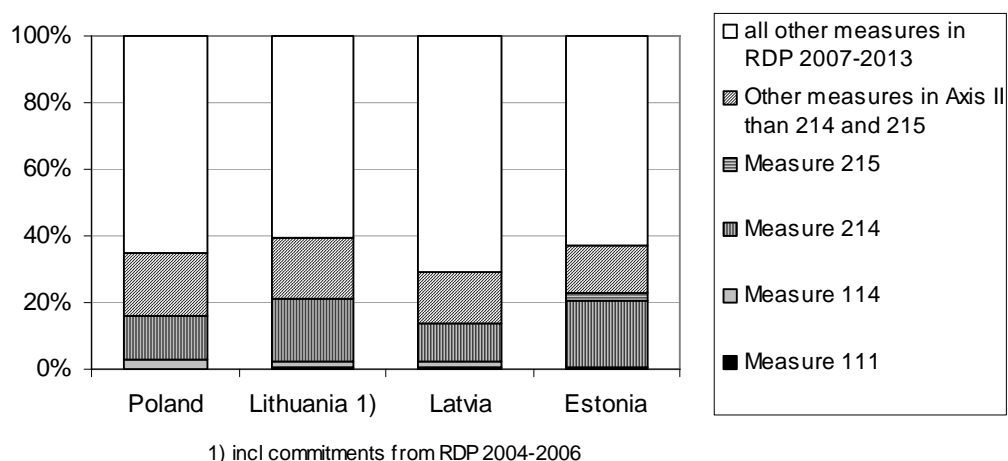


**Table 6. Measures 111, 114, 214 and 215, other measures and total budget of RDP 2007-2013 (million EUR)**

	<b>Poland</b>	<b>Lithuania<sup>1)</sup></b>	<b>Latvia</b>	<b>Estonia</b>
Measure 111	40.0	17.4	10.2	4.3
Measure 114	437.5	38.3	21.4	2.3
Measure 214	2 303.8	423.0	151.3	184.1
Measure 215	0	0	0	21.7
Other measures in Axis II other than 214 and 215	3 242.2	407.6	213.7	128.7
Total Axis II	5 546.0	830.6	365.0	334.5
Total 111,114, 124, 125	2 781.3	478.7	182.9	212.4
All other measures in RDP 2007-2013	11 194.3	1 373.8	965.0	583.8
Total RDP	17 217.8	2 260.1	1 361.6	924.9
Measures 111, 114, 214, 215 as share of total budget (%)	16	21	13	23

<sup>1)</sup> Including commitments from RDP 2004-2006.

Sources: *The Rural Development Programmes for 2007-2013 for Poland, Lithuania, Latvia and Estonia respectively.*



**Fig. 17. Share of Measures 111,114, 214 and 215 and all other measures in RDP 2007-2013.**

Sources: *The Rural Development Programmes for 2007-2013 for Poland, Lithuania, Latvia and Estonia respectively.*

In all the countries, the Code of Good Agricultural Practice (GAP) is compulsory for the beneficiaries of agri-environmental support. GAP encompasses rules for nutrient (mainly nitrogen) management, restricted livestock density, manure storage and spreading and pesticide handling and in all the countries, GAP is a publication that has been approved by the government.

The activities under Measure 214 are listed in Table 7 as they are named in the respective national programme. Some of the activities could possibly be included under a common name but it has not been possible within the scope of this study to make detailed comparisons between the national programmes.

*Table 7. Quantified targets for the activities under Measure 214*

<b>Activity</b>	<b>Poland</b>	<b>Lithuania</b>	<b>Latvia</b>	<b>Estonia</b>
<i>Organic farming</i>				
	25 000 farms, 500 000 ha	6 000 farms, 240 000 ha	5 738 farms, 207 728 ha	1 800 contracts, 100 000 ha
<i>Environmentally friendly agriculture/sustainable farming</i>				
	6 000 farms, 150 000 ha	improving water quality: 250 contracts 2 000 ha	4 105 farms (year 2006), 150 016 ha (year 2006)	5 000 contracts, 400 000 ha
<i>Integrated horticulture</i>				
			2 000 farms, 12 000 ha	
<i>Biodiversity on grasslands</i>				
	190 000 ha	Landscape stewardship scheme meadows, wetlands: 800 contracts 3 080 ha	5 828 farms, biodiversity in grasslands 46 000 ha	
<i>Protection of endangered bird species and natural habitats outside Natura 2000 area</i>				
	220 000 ha		Total in Latvia 320 bird species	
<i>Protection of endangered bird species and natural habitats inside Natura 2000 area</i>				
	150 000 farms, 370 000 ha		67 are endangered bird species. Source: VARAM, Sugu un Biotopu projects (1998- 2000). 784 000 ha	
<i>Preservation of endangered genetic resources in agriculture</i>				
	Plants: 56 000 farms, 13 000 ha Animals: 10 600 farms, 65 950 animals	400 contracts 7 000 animals	Plants – there is no support.	1 000 contracts, 10 000 ha
<i>Stubble fields in winter period</i>				
			4 000 farms, 100 000 ha	

## 6. Estonia

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### 6.1 Organisation and significance of the agricultural sector

#### 6.1.1 General information about Estonian agriculture

According to preliminary data, the value of agricultural production was 511 Million EUR in 2006. Livestock (53.7 per cent) and crop (34.6 per cent) production accounts for the bulk of total agricultural production in terms of value. The value added by agriculture was 11.7 per cent, and it decreased by nearly 0.9 per cent per year in GDP from 1992-2001. The value added started to increase again after Estonia acceded to the EU.

In 2005, agriculture employed 23 400 persons, which is 3.9 per cent of the national workforce. In comparison, in 1992 agriculture employed 114 600 persons, which was 15 per cent of the national workforce.

According to the 2005 structural survey data, there are 27 747 agricultural holdings in Estonia. If the agricultural holdings that have applied for the Single Area Payment (SAP) for agricultural production or landscape maintenance are regarded as active agricultural holdings, there are about 19 000 applicants for SAP in Estonia. At the same time, it should be considered that Estonia only has about 7 000 professional commercial enterprises that receive most of their income from agricultural production larger than 2 European Size Units (ESU) (*1 ESU = 1 200 EUR*). The number of agricultural holdings has decreased consistently. According to the 2001 structural survey, there were more than 54 000 agricultural holdings in Estonia, including more than 8 000 professional farms.

The total output of the food industry was 952 million EUR in 2006 and it accounted for 17 per cent of the total value of industrial output. The dairy industry (28 per cent), beverages industry (21 per cent), meat industry (18 per cent) had the largest shares in the food industry's total output. The value added by the food and beverages industries was 177 million EUR in 2005 and the sector accounted for 1.6 per cent of GDP. The value added by the food industry has not significantly changed over the past three years.

Organic processing has developed rather slowly up to now. By the middle of 2006, only 16 organic processing enterprises had been entered in the register of organic farming, of which two are authorised meat plants, two enterprises are engaged in the production of milk products, four enterprises produce cereal-based products and the remaining enterprises are active in the processing and packaging of fruit, vegetables, berries and herbs.

Agricultural products accounted for 7 per cent of total export and 7.3 per cent of total import of goods in 2006. The value of agricultural exports and

imports was 535 million EUR and 754 million EUR respectively. Export volumes increased by 20 per cent during the year.

### 6.1.2 Producers' organisations

*Estonian Chamber of Agriculture and Commerce (ECAC)* was established in 1996 as an association of agricultural producers and processors in private law. As of 1997, a number of organisations and institutions supporting the food sector have joined it (trade enterprises, education institutions, etc.). By spring 2007, the ECAC had 123 members, including 16 local and 3 national associations of agricultural producers, as well as 18 larger professional associations.

*Central Union of Estonian Farmers*, founded in 1990 as a union of Estonian agricultural producers. Members of the CUEF produce up to 70 per cent of Estonian agricultural output.

*Estonian Farmers' Federation*, founded 1989, has more than 5 000 members.

There are also organisations of producers of certain products and others such as *Estonian Dairy Association*, *Estonian Meat Association*, *Estonian Pig Breeders Association*, *Estonian Co-operative Association* and *Estonian Horticultural Association*.

## 6.2 Environmental effects of Estonian agriculture

### 6.2.1 Natural conditions and general water quality

Estonia has favourable conditions and natural resources for developing environmentally-friendly agriculture and forestry and for preserving its typical agricultural landscapes and biodiversity. Agricultural enterprises have an impact on species richness, soils, water and air, depending on production intensity. The heritage of traditional cultured landscapes can only be preserved through constant maintenance.

Agricultural production is one of the main influences on water resources in rural areas. Even according to biological oxygen demand (BOD7) and oxygen content, the condition of rivers may be regarded as good or very good. Excess nutrient (particularly phosphorus) content is the main problem of Estonian rivers. Most of the water bodies are rather shallow and sensitive to pollution. In Estonia, groundwater mainly lies in five aquifers, of which the top layer is for the most part insufficiently protected. The main agricultural point sources of pollution are non-compliance or lack of manure storage facilities and silos, as well as fertiliser and fuel storage facilities. Under the compliance measure of the Estonian Rural Development Plan (ERDP) for 2004-2006, support was made available for reconstructing manure storage facilities, so that the greatest problems should be resolved by now.

Although the use of fertilisers has decreased several-fold compared with the 1980s and 1990s, the quantities of fertilisers used per unit of fertilised land have gradually increased since 2000.

Groundwater status is good in Estonia's natural, sparsely populated and extensively used areas. However, more fertile soils, which are in more intensive agricultural use, are often located in areas where the groundwater is weakly protected, karst areas and Pandivere water protection areas, for example. The uppermost aquifer is currently in poor condition in certain areas where the soils are thin and the feeding conditions of groundwater are unfavourable, such as the Adavere-Põltsamaa area. The average nitrate concentration in the area as a whole is below 50 mg/L, but in problematic wells, water is unfit for oral consumption because of nitrates.

The Pandivere area, a nitrate-vulnerable area is an important groundwater area for the whole of Estonia. The plains of Central Estonia are a local groundwater area and a transit and outlet area. According to the monitoring data of 2005, groundwater condition is generally good in the Pandivere area, regarding nitrogen compounds. In groundwater near the surface, the average nitrate ion content is 15-20 mg/L at present. In the Adavere-Põltsamaa area, there are some wells in which the nitrate ion content exceeds the permitted limit (Fig 18).

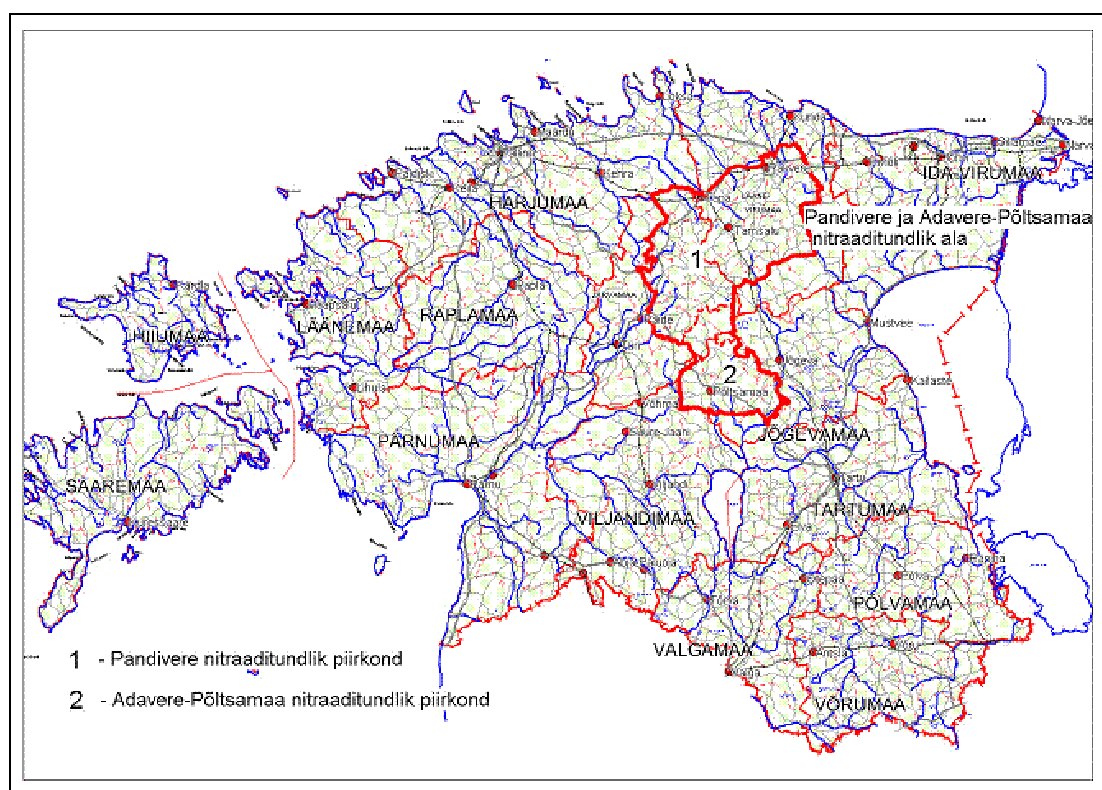


Fig. 18. Nitrate-vulnerable areas in Estonia.

The most fertile soils of Estonia are located in the nitrate-vulnerable area. This makes agricultural production complicated there. Compared with the average for Estonia, land use is 50 per cent more intensive in this area. The same can be said about livestock farming – 35 per cent of cattle, 30 per cent of pigs and 12.5 per cent of poultry are raised in the nitrate-vulnerable area. The cultivated areas of nitrate-vulnerable land amount to 1 190 km<sup>2</sup>.

## 6.2.2 Results of monitoring

In the Baltic Environmental Agricultural Run-off Project, three demonstration catchments for surface water monitoring were established in Estonia with the aim of demonstrating to farmers how agriculture influences the environment. These catchments were: Rägina, Rāpu and Jānijõgi (Fig. 19).



Fig. 19. Locations of small agriculture-dominated monitoring catchments in the Baltic Republics.

The results of the monitoring results do not show any trends in N and P concentrations except in the River Rāpu in the years 1995–2006 (Fig. 20).

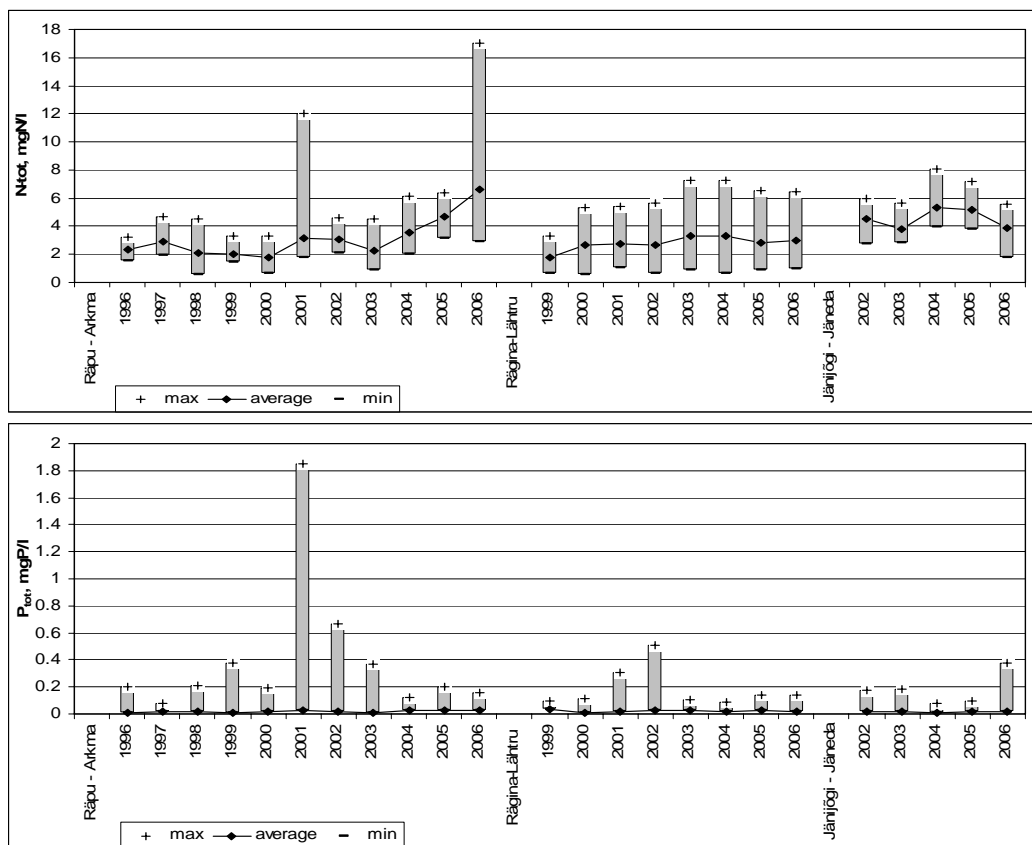


Fig. 20. Average, maximum and minimum concentrations of nitrogen and phosphorus in the streams Rāpu, Rägina and Jänijõgi during monitoring period.

The area specific nitrogen load has increased in both the Rāpu and Rägina stations in the recent years (Fig. 21), probably due to the intensification of agricultural production, increased consumption of fertilisers and use of former abandoned arable land. No trend was detected for phosphorus loads.

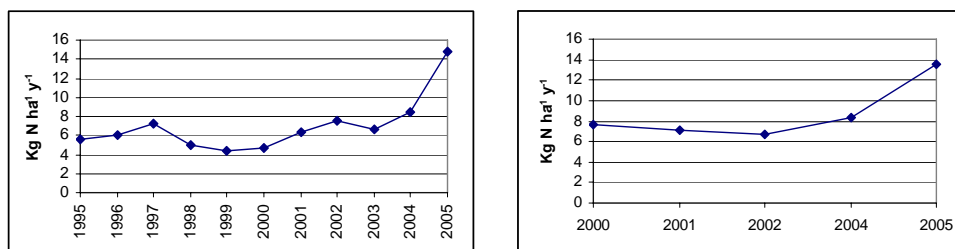


Fig. 21. Flow-adjusted total nitrogen area specific runoff in the stations Rāpu (left) and Rägina (right) during monitoring periods.

The annual nitrogen runoff from the Jänijõgi basin, located in a nitrate vulnerable zone, is much higher than the runoff in Räpu and Rägina stations. The mean TN load in 2002-2006 was  $15.0 \text{ kg N ha}^{-1} \text{ yr}^{-1}$  varying between  $5.1$  to  $23.1 \text{ kg ha}^{-1} \text{ yr}^{-1}$ .

### 6.2.3 National objectives as regards agriculture

According to the Estonian Rural Development Strategy (ERDS) 2007-2013, increasing the competitiveness of agriculture and forest management will require more attention to be given to increasing the proportion of higher value-added production by product development and the assurance of stable quality. This will require more emphasis on the development of technology and closer co-operation with different research establishments. At the same time, considering the great need for investment accompanying agricultural production and agricultural produce processing since 1990s, which is increasing due to the new additional requirements, modernisation of agriculture and the processing industry will be of the greatest importance in the development of the competitiveness of agriculture and forest management in 2007-2013.

Specific objectives identified are as follows:

- Diversification and/or expansion of production to be promoted in the sectors of normal market outlet. Micro-agricultural producers are regarded as the specific target group.
- Support for the development of agricultural and forest management infrastructure (land improvement, incl. forest drainage, and access to agricultural and private forest land) as well as for the construction and reconstruction of agricultural buildings and facilities with a long pay-back period.
- Improvement of animal welfare and application of more environmentally friendly cultivation methods.
- Continuation of soil protection activities to be ensured in areas with acid soils.
- Promotion of participation of the younger generation in agriculture.
- Investments made by agricultural producers for the use of Best Available Technology (BAT) to be supported by the public sector, if necessary.
- Introduction of clean technology, particularly targeted at compliance with environmental requirements (waste management among others), increase in the share of environmental investment in total investments of the sector.
- In the food processing industry, attention to be given to more active product development, in order to increase value added and to improve product quality. As placing products on the market is a problem in several niche sectors (e.g. organic agriculture), attention should be given to quality, product development and marketing in these sectors. The objective is to attain by the end of the period a



situation where value added per person approaches the EU-25 average and the share of exports in production increases.

- Investments focusing on the production of renewable non-food raw material (incl. bioenergy raw material) and of bioenergy from self-produced raw material to be promoted in agriculture, forestry and the food processing industry.
- Improvement of the economic value of private forests, with the development of economic activities creating additional value to forestry products and to the attainment of competitiveness of forest management in the long run.
- Co-operation of the sectors of agriculture and forestry management and agricultural and forestry products processing industry with research establishments to be promoted. Co-operation between the sectors of research, production and processing in the development of new products competitive on the market (incl. bioenergy) to be supported.
- Development of advisory and training system for agricultural producers, private forest owners and processors of agricultural and forestry products as a link between research and production sectors is important.

#### 6.2.4 Priority activities of the agri-environment programme

In the period 2007-2013, the 2004-2006 level of financial resources focused on maintenance of the agri-environment and the countryside will generally be maintained. The solution of specific environmental issues will be concentrated on planning new activities under agri-environmental support.

- Five-year commitments in Rural Development Programme (RDP) 2004-2006 should be financed until their conclusion.
- Additional measures should be taken to attain good status of the environment in the nitrate-vulnerable zone (BAT, basic agri-environmental support and organic farming).
- Activities helping to preserve biological and landscape diversity.
- Support for preserving endangered breeds and varieties.
- Establishment and restoration of stone walls.
- Afforestation of the areas left out of agricultural production, in particular of protective belts.
- Energy crop growing.
- Land use in less favoured areas (LFA).
- Compensation for the loss of income incurred by landowners due to restrictions in Natura 2000 areas.

### 6.3 Organisation of independent advisory service

In 2004, the concept of county advisory centres was launched, in order to ensure better possibilities for the re-training of agricultural advisors, for the dissemination of information about research and national matters, for the collection and communication of producer feedback, and for the quality of

advice and the appearance of new advisors on the market. The advisory centres are intended to implement the obligation of the EU member states to provide an advisory system, which has to guarantee advice for agricultural producers, at least with regard to meeting compulsory management requirements and good agricultural, food handling and environmental conditions.

The private advisory system applied in Estonia has been formally operating since 2005, when 15 advisory centres were approved under the CAP Implementation Act (fig 22.).

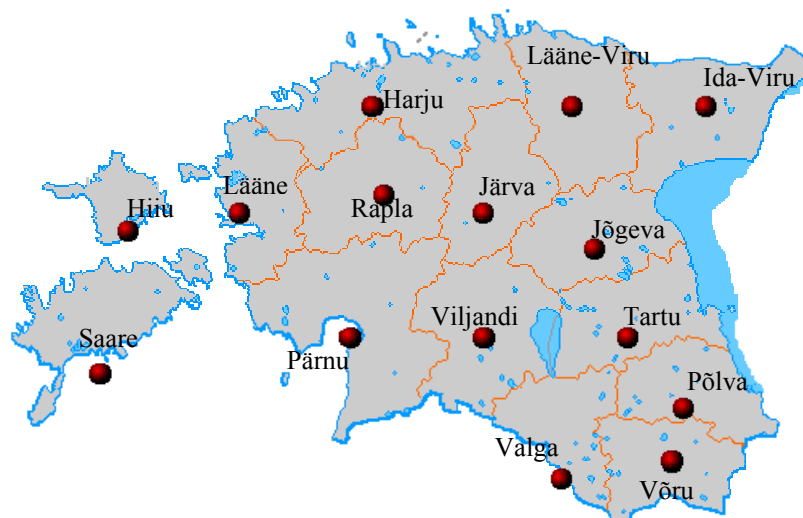


Fig 22. The extension institutions active in Estonia.

The advisory system has to be regarded as a link between research, organisation of studies and active agriculture, where through advisors the results of studies and research have to reach active farmers and food handlers. Through advisors, the problems of active agriculture also have to reach the organisers of research and training.

To ensure the quality of advice, certification of agricultural and rural development advisors has been organised and an affiliation system for the advisory profession is under organisation. There are approximately 100 certified advisors in the following fields:

- Forestry (39)
- Economics (37)
- Plant production (26)
- Agro-environmental programme (18)
- Animal husbandry (15)
- Melioration, Bee-keeping, Building construction, Mechanisation, Fruit culture, Aquaculture, Horticulture

### 6.3.1 Structure and duties of advisory centres

As a result of the inspections held in 2005, the Minister of Agriculture certified 15 county advisory centres, most of them related to producers' and farmers' unions. The basic duty of an advisory centre is to be present in the region and to provide clients with new information, incl. publications. In addition to advice on cross-compliance and other agricultural problems, advisory centres also offer producers broader information and training, help to find the necessary information and to understand legal acts, introduce and distribute printed material and organise information events.

### 6.3.2 Duties of coordination centre

In 2007, an advisory service coordination centre will be established. In addition to the duties of an advisory centre, it also has to ensure unification of the level of information given by advisory centres, training and in-service training of agricultural advisors, and to organise the communication to advisory centres of information relating to national measures, as well as feedback and arrangement of the schedule of forestry, agricultural and rural economy information days. For coordination activities, four additional sectoral directors (plant production, livestock farming, finance and other rural fields of activity) will be employed at the coordination centre.

### 6.3.3 Supporting advisory services

It is planned to support individual advice and group advice (national and county information days) and the development of the advisory system and supporting structures (development support).

Support is provided for making individual advisory services available for agricultural producers and private forest holders in the following fields:

- Advice for meeting the statutory management requirements and good agricultural and environmental conditions, provided in Articles 4 and 5 and Annexes III and IV of Council Regulation (EC) No 1782/2003.
- Advice to individual enterprises in the field of meeting the requirements proceeding from the EU occupational safety standards and of bringing enterprises to compliance with those standards.
- Advice on improving the general performance of an agricultural holding or a private forest holder, with information about scientific data on different technologies, incl. changing or restructuring the main activity, or advice on the maintenance of biological diversity.

Advisory support may be applied for by:

- Agricultural producers active in the territory of a hamlet, village or small town, owning or using on a legal basis at least 0.3 ha of profit-yielding land.
- Private forest holders in the territory of a hamlet, village or small town owning or using on legal basis at least 0.3 ha of profit-yielding land.

Up to 80 per cent of eligible expenses for advisory services may be applied for, but not more than 1 500 EUR per year.

A major task of the coordination and regional centres is to collect and forward information and feedback. The tasks look the same, but the level of the activities is different. Advisory centres will collect information and feedback from the local producers and from linked advisors and forward it to the coordination centre, as well as to their own partner advisory centres. The task of the coordination centre is to collect information and feedback from the whole state, including from regional advisory centres. The data will be analysed and forwarded to the ministries and other partners in national and international level.

Advisory centres are basically funded as follows:

RDP (Rural Development Plan) - Advisory Subsidy	
2006	119.5 thousand EUR
2007 prognosis	255.6 thousand EUR
RDP - 3.8 information days	
2006 applications	204.5 thousand EUR
2007 applications	124.5 thousand EUR

From the State Budget

Extension (information distribution), divided through coordination centre to advisory centres

2006	204.5 thousand EUR
2007	178.9 thousand EUR

Advisory coordination

2006 -	198.1 thousand EUR
2007	594.2 thousand EUR

## **6.4 Ongoing advisory programmes**

A new RDP measure was applied in 2005 to support the development of the advisory system: Measure 3.8 – support for advisory and information services. Support was available under four sub measures as of the second half of 2005: setting up of advisory centres, advisory support and support for nationwide and county information days. There are some national projects on developing advisory tools including tools for introducing cross compliance and environmental aspects.

In 2006/2007 a questionnaire was carried out among the users of advisory service. A very high grade was given to the quality of the services -81 points out of 100. The interest to use the services during the next year was also rated very high, 93 points.

The reason for the lower use of individual advice from RDP Measure 3.8 within the period 2005-2006 was the lack of consistency of advisory support in 2004 (the measure was introduced in the second half-year of 2005), as a

result of which many applicants and advisors lost interest in this field. Smaller enterprises did not apply for support, as the volume of cost-sharing was too high. Larger enterprises used advice but did not apply for support, considering the application bureaucracy burden to be too great. A large share of the need for advice is covered by well-organised and concentrated input sellers and professional associations.

Within the period 2005-2007, advisory support has been used by approximately 800 enterprises. The supported advisory service is directed at enterprises larger than 5 ESU, but other groups are not precluded. Group and mass advice methods are directed at smaller enterprises, which are also offered short-term free advice.

### **6.5 Advisory services by the industry or producers**

In addition to the 15 new advisory centres, many of which will be run by farmers' organisations, an advisory service on production technology is provided by for example the pig producers' organisation, which employs a total of five advisors and input sellers.

### **6.6 Contacts between research and advisory service**

There are training days, meetings etc jointly organised by the advisors and the research institutions listed below:

*Estonian Research Institute of Agriculture (ERIA)*. ERIA's field of activities includes fundamental and applied studies of crop cultivation, post-harvesting, processing and preservation, development activities, innovation and testing of agricultural machinery. The main tasks of ERIA in the sphere of activities are:

- Fundamental and applied studies in the field of land use, soil cultivation, sowing, fertilisation and plant protection, harvesting, post-harvest processing, preservation, primary processing and utilisation of the yield, agro- and machine technologies for fodder production, development activities and innovation
- Predicting patterns of agricultural technologies
- Producing development strategies and technical observations on agricultural technologies
- Experimentation and testing of agricultural machinery and technologies
- Arranging advisory activities and advanced training within their own competency and issuing of publications.

*Jõgeva Plant Breeding Institute* is an autonomous state research and development institute under the jurisdiction of the Ministry of Agriculture of Estonia. The main areas of activity of the Institute are variety breeding of agricultural crops, applied research on agro-technical aspects and seed production of agricultural crops and basic research in genetics and

heritability of valuable traits, selection and description of genetic resources. Maintenance of plant genetic resources in the genebank started in the past decade.

*Agricultural Research Centre (ARC)*. The main activities of the ARC are field tests and experiments, laboratory analyses, preparing liming and fertilising maps, good agricultural practices and agro-chemistry research, evaluation of agri-environmental measures, horticultural testing activities, etc.

*Rural Economy Research Centre*. The main field of activity is collecting and processing of data and analyses for Farm Accountancy Data network (FADN) The organisation is responsible for organising the qualification nomination for agricultural advisors and there is also a “National Rural Network Unit for Estonian Rural Development”.

*The Estonian University of Life Sciences* has five Institutes: Institute of Agricultural and Environmental Sciences, of Veterinary medicine and Animal Sciences, of Forestry and Rural Engineering, of Technology and of Economics and Social Sciences. The university produces the newsletter ‘e-farmer’

## **6.7 National legislation on water protection**

*Water Act* – main legislation in the environmental field.

Natura 2000 areas are protected by the state under the *Nature Conservation Act* as protected areas, special conservation areas or permanent habitats. Protected areas and special conservation areas are placed under protection by regulation of the Government of the Republic of Estonia, permanent habitats by regulation of the Minister of the Environment.

## **6.8 Relevant EU directives and programmes**

### **6.8.1 Nitrate Directive and Water Framework Directive**

Regulation No 17 of the Government of the Republic of Estonia, 21 January 2003, establishes the Pandivere and Adavere-Põltsamaa nitrate-vulnerable area, of which the total area is 3 250 km<sup>2</sup>, i.e. 8 per cent of the total mainland of Estonia. Restrictions concerning both acts are mainly contained in the Water Act and legislation under the Act.

### **6.8.2 Integrated Pollution Prevention and Control (IPPC) Directive**

Estonia is the only country that has established the obligation of integrated environmental permits and the best available techniques (BAT) for larger livestock farms (from approx. 300 LU) in addition to pig and poultry farms. The Information and Technology Centre at the Ministry of Environment keeps the database on IPPC licences and at present there are two pig farms registered.

### 6.8.3 Cross-compliance regulations

Cross-compliance requirements influencing the implementation of the rural development measure are equivalent to the requirements provided in Council Regulation (EC) No 1782/2003. From 2009, step-by-step statutory management requirements will apply. From a survey it was concluded that some enterprises can comply with cross compliance requirements, some comply partly and one tenth of the respondents did not have an overview of their actual operation. The difficulty of meeting the standards lies in the farmers' lack of knowledge and the accessibility of the information.

## 6.9 Conclusions and recommendations

The focus on 'environmentally friendly farming' (and 'organic farming') in RDP 2007-2013 is targeting the problem of nitrate pollution of groundwater, at least in certain areas, and the risk of increased nitrogen runoff in areas where agricultural production is increasing or becoming more intensive.

Estonia is now partly rebuilding a state supported advisory service which practically disappeared some years ago. Meanwhile, private alternatives, sometimes connected with input sellers, have taken over a large part of the advisory market (as well as probably the experienced advisors) and will probably continue to play an important role in RDP 2007-2013. At the moment the state-supported advisory service is coordinated by the Chamber of Agriculture and Commerce but it is not clear for how long this will be the case and the planning situation is rather difficult. The most crucial issue at the moment for advisors is the cross-compliance regulations, which apply already and must be communicated to the farmers and within this field all different expert areas of agriculture must be covered.

Compared to the other countries studied, Estonia has applied more strict legislation for large-scale livestock production, i.e. the requirement for environmental permits from 300 animal units. In the long-term perspective the livestock producers need the help of experts in this field.

## 7. Latvia

### 7.1 Organisation and significance of the agricultural sector

#### 7.1.1 General information about Latvian agriculture

The natural conditions for agriculture in Latvia are considered to be less favourable than for other European countries. Over 90 per cent of agricultural land is too wet and 63 per cent of agricultural lands are drained (approximately 1.6 million ha). Soil chemical data show that 40 per cent of the soils in Latvia have increased acidity, including 23 per cent acid soils (pH <5.6). Amelioration projects are going on with support from the EU.

The share of the workforce employed in agriculture is decreasing year by year, but agriculture reported the highest economic activity in rural areas. Employment growth in other sectors has been sluggish, as other basic sectors of the rural economy have comparatively limited alternatives.

After actual amounts of crop farming (in producers' prices) increased significantly in 2005, in 2006 they then decreased dramatically by 11.9 per cent. However, due to the increase in e.g. cattle breeding (+6.4 per cent), the total amount of final output decreased only slightly, by 3.2 per cent. Production decreases were recorded in all main farm crops. In animal breeding the amounts of all major product types have increased, except in pig-breeding. The main increase has been in poultry production and for cattle.

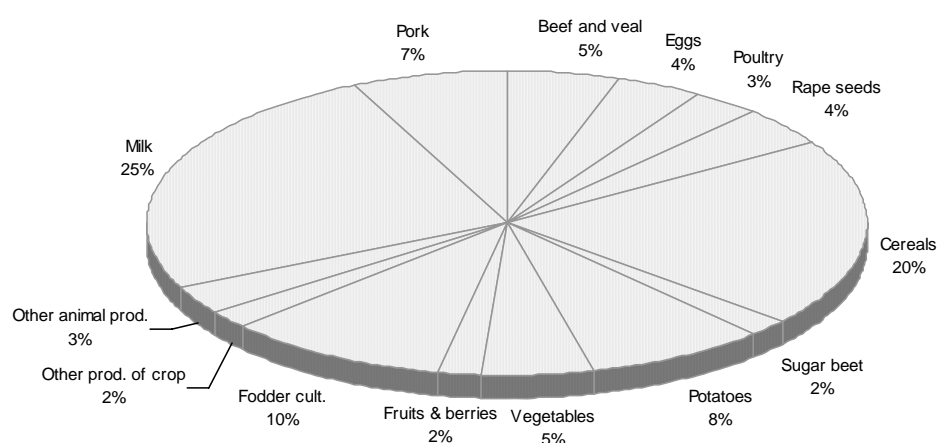


Fig. 23. Structure of the agricultural end-products in 2006 (in base prices).

Source: The Institute of Agrarian Economy of Latvia (IAEL), Economic Accounts of Agriculture (EAA).



The most significant agricultural product of Latvia remains milk, which comprises one-quarter of the total value of agricultural products in base prices, followed by cereals (19.5 per cent) and fodder crops (10.3 per cent) (Fig 23). The dairy industry is located all over the country but more in the Kurzeme and Vidzeme regions. Beef cattle production is located more in the Latgale and Vidzeme regions.

The overall number of employees is following an upward trend in Latvia; nevertheless, the share of those employed in agriculture is decreasing year by year. From 2001 until 2006, the total workforce in Latvia increased by 7.5 percentage points, reaching 66.3 per cent, but the number primarily employed in agriculture decreased from 12.5 per cent to 8.1 per cent, amounting to 88 000 people in 2006. Unemployment decreased by 24 per cent in 2006 compared with 2004 thanks to the rapid economic development and movement of some of the workforce to other EU Member States.

### 7.1.2 Producers' organisations

Cooperative societies have been developing since 2000 and in 2006, the turnover of cooperative societies providing agricultural services increased from 17.2 million EUR to 23.1 million EUR. In total, 88 cooperative societies with 7 430 members provide agricultural services in Latvia, mainly in crop pre-processing and storage and milk production.

The main cooperation partner of the Ministry of Agriculture in issues concerning development planning and support policy for cooperative societies providing agricultural services is the *Latvian Agricultural Cooperatives Association (LACA)*, the objective of which is to create an environment fostering the development of farmer cooperation in Latvia and to promote and ensure the stability and modernisation of farming. The association includes 63 cooperative societies providing agricultural services.

The *Cooperation Council of Farmers' Organisations (CCFO)* established in 2000 ensures an effective information exchange between the farmers' institutions and the Ministry of Agriculture. The Council is a consultative institution currently uniting 47 producer organisations, including 5 multi-sectoral organisations, 34 sectoral associations and 8 associated members. One of the tasks of the Council is to promote discussions between the farmers' organisations and the Ministry of Agriculture and other public institutions on topical agricultural issues. The CCFO is represented in Brussels.

## 7.2 Environmental effects of Latvian agriculture

Monitoring of a number of small agriculture-dominated catchments has been established in the Baltic republics through the BAAP-BEAUROP and GEF-BSRP projects (Fig 19). In the projects, the monitoring stations have been upgraded to up-to-date international standards. Thus continuous monitoring of discharge and automatic water sampling is performed in the main part of them today.

There are three agricultural monitoring catchments in Latvia, two characterised by intensive grain farming and the third by low input farming. There is a clear increasing trend in the concentration of nitrogen in the drainage water, as well as in the total nitrogen load from 1994 to 2005 in the two catchments with intensive grain farming. This can to a large extent be explained by intensification of agricultural production, increased consumption of fertilisers and use of former abandoned arable land in these catchments. The change in total load is shown for one of the catchments, Berze, in Fig. 24.

In the catchment with low input farming there has been no significant change in either the concentration of nitrogen in drainage water or in the total load of nitrogen. Studies at field level (drainage fields in the Mellupite and Berze regions) show that in the future the situation could be improved if farmers were able to introduce better nutrient management practices and agricultural technologies promoting high yields (nutrient output).

Statistics on fertiliser use are not available on the level of nitrogen, phosphorus and potassium for the latter years but the general opinion is that the use of fertiliser is increasing from a low level. New fertiliser recommendations have been developed and new standards for estimating nutrients in manure.

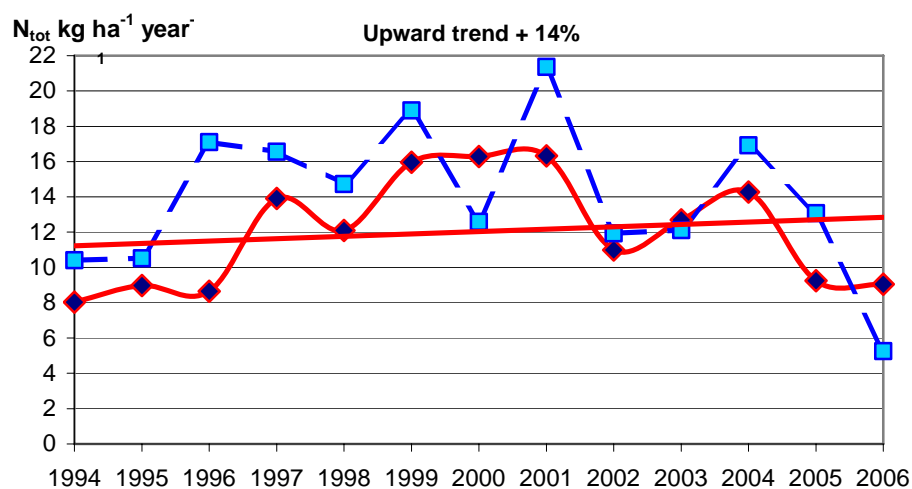


Fig. 24. Annual loads of nitrogen from Berze catchment. The two curves represents loads before (dashed line) and after (solid line) flow normalisation according to the Mann-Kendall test.

Source: GEF/BSRP FINAL REPORT Component 2 - Monitoring and Assessment, V. Jansons, Latvian University of Agriculture.

The use of pesticides in Latvia is shown in Table 8 in tonnes of substance. Farmers need a certificate in order to handle pesticides, they must keep a spraying journal and the sprayers must be tested.

Table 8. Amount of different kinds of pesticides per year (tonnes of substance)

	Insecticides	Fungicides	Herbicides	Other	Total
Total, tonnes	75	360	1282	169	1886

Source: The Latvian State Plant Protection Service, Plant Protection Products Supervision Division.

### 7.3 Organisation of the independent advisory service

The *Latvian Agricultural Advisory and Training Centre (LRATC)* was established in 1991. The national office is situated in Ozolnieki, about 30 km south of Riga (Fig. 25). The organisation is under the Ministry of Agriculture and receives about 50-60 per cent of its funding from the state. LRATC has about 377 employees and there is one *Rural Advisory Office (RAO)* of the LRATC in each of the 26 regions.



Fig. 25. Locations of the Latvia Rural Advisory and Training Centre (LRATC) with Rural Advisory Offices.

In the Rural Advisory Offices (RAO) there are advisors in the different fields of production and in the regional offices there is always an advisor specialised in plant production, often one in animal husbandry, economics, crop farming, book-keeping, veterinary medicine, rural development and technical matters respectively, as well as other fields. Each crop advisor has on average 20 clients who pay for services in crop and fertiliser planning, advice on plant protection via field visits and economic evaluation of production. The advisor arranges field days which are also visited by farmers other than the clients.

The main activities are advisory services and training of farmers and rural entrepreneurs, farm demonstration programmes, market surveys, information for farmers, administration of agricultural school work, etc. (Table 9).

The main aims are: Improvement of the efficiency of agriculture in Latvia, development of market-orientated agriculture, assisting development of rural economy and welfare.

*Table 9. Activities of the LRATC in 2004-2006*

	<b>2004</b>	<b>2005</b>	<b>2006</b>
Number of free advisory services	40 000	36 000	60 000
Preparation of informative material for farmers, fact sheets	33	22	30
Number of interest groups	97	75	75
Life-long education seminars, listener hours	60 000	80 000	30 000
Qualification improvement measures, days	45 000*	320	320

\**Listener-hours*

In 2006, the LRATC had a self-financing level of 68 per cent with a total revenue of 1.2 million EUR. These figures show the growing interest of farmers in using the services and strengthening the position of the company in the field of rural advisory services. As a result of continuous cooperation between the Ministry of Agriculture, LRATC and the Latvian Association of Local and Regional Governments, the Rural Advisory and Information Exchange System continues its work. LRATC coordinates and methodologically manages the work of municipal specialists in promoting rural development in 510 local municipalities of Latvia.

LRATC participates in the Interreg IIC initiative project Rural Advisory Network, Europe (RENE) together with 19 rural advisory organisations from 13 European countries. The project involves common planning of a rural advisory strategy and its development in the European Union and it provides opportunities for specialists to attend seminars in other European countries.

LRATC participates in the Interreg IIC project Action Learning for Identity and Competence in European Rural Areas or ALICERA. The project involves 7 organisations from 5 countries (Austria, France, Latvia, Hungary and Germany). One of the main objectives is strengthen city-dwellers' bonds to rural areas and to educate them about life in the countryside, identity and competence. In order to achieve the goal the education method applied is active learning. The target territory is the rural areas of Europe.

There is a United Nations Development Programme (UNDP) and the Global Environmental Facility (GEF) project on Building Sustainable Capacity and

Ownership to Implement the United Nations Convention on Combating Desertification/Land Degradation (UNCCD) objectives in Latvia. The project period is December 2005 until January 2008. The main goal of the project is to improve knowledge at all levels, from farmers to senior officials of ministries, about land degradation and sustainable development, analysis and decision-making skills, as well as the ability to take appropriate action to reduce land degradation risks. At the same time the Project provides assistance to the government of Latvia in fulfilling its commitments that it has undertaken by signing the Convention.

## **7.4 Ongoing advisory programmes**

### **7.4.1 Programmes specifically related to environmental problems**

There is an ongoing national project from 1999 to 2007 called the Demonstration Programme, aimed at showing effective and economically viable management methods in crop production in field demonstrations.

The project 'Restoration of Latvian floodplains for EU priority species and habitats' is a European Union LIFE-Nature programme in cooperation with UNDP Latvia/GEF and the Ministry of Environment of the Republic of Latvia, and the project period is 2004-2008. The activities are aimed at the exchange of information on floodplain meadow management methods. Seminars, visits to different management areas (including other LIFE-Nature projects) and production of 'best practice' management guidelines will be carried out. Experts will assist farmers in preparing applications for agro-environmental support to ensure future management of restored floodplain meadows. Local seminars and work with individual landowners will be organised.

In 2006 implementation of the LEADER+ type measure was initiated. The aim is to increase the activity and involvement of the rural population in solving the problems of their area by implementing their own projects, which are coordinated within the pilot integrated rural development strategy elaborated by the local action group (association of foundation), in such way as to improve the quality of economic and social life, as well as preservation of the environment. At the end of 2006, local action groups were selected and two providers of services were selected: LTD (Latvian Rural Advisory and Training Centre) and a partnership of parties made of the Latvian-British Joint Venture (Zygon Baltic Consulting, LTD-Consorts, LTD-Consultants, LTD-Latvian Rural Advisory and Training Centre and LTD-Firma L4).

In the Baltic Sea Regional Project, the concept of Environmental Management System (EMS) courses has been developed to help farmers assess the current situation, to suggest investments and changes in management and to assist in finding credits and grants that will improve the environmental situation.

The EMS has a technical role including:

- Information about the status in the Baltic Sea and nutrient loads from different sources
- Information about nutrient flow
- Information on good practice for manure and pesticide handling
- Suggestions on technical solutions and management
- Calculation of nutrient balance
- Environmental checklist at the farm.

The economic part of EMS includes:

- Theory of economic calculations
- Profit/loss, balance sheet
- Calculation of key figures
  - equity, profit etc.

#### 7.4.2 Examples of successful approach

One example of a successful advisory approach is the farmers 'Interest Groups' on milk quality, meat production, horse breeding, pig production, crop farming, etc., which were organised by specialists from LRATC Regional Rural Advisory Offices. The concept involves practical and theoretical exchange of experience and information on the participants' farms. A total of 75 Interest Groups operated in all districts of Latvia during the period 2004-2006.

The Annual Silage Competition in Latvia, organised by LRATC to find the best silage makers and to distribute information about environmental protection aspects of preparing forage, is a success, as is the Annual Cutting Service in which farmers are informed about optimal forage cutting times in different Latvian regions. This information is relayed by Latvian Radio Channel 1.

#### 7.4.3 Problems experienced

It is a problem to find sufficiently high-qualified agricultural specialists who can spread the required knowledge to farmers regionally. The farmers have a lack of knowledge about national legislation in environmental protection and as a result, regulations are sometimes ignored.

There is a need for support to train animal breeding specialists abroad, due to a lack of provision for fast and highly qualified science development in the agricultural sector in Latvia. It is necessary to prepare information materials for farmers about new legislation and other requirements.

At the end of 2005, a questionnaire was sent to farmers about their interest in Interest Group activities. The results shows that the majority of the farmers wanted to continue participating in the Interest Groups and that they were very satisfied with this kind of advisory work.

Farmers reported that they were very pleased with the advisory service and they are expecting more specialised knowledge and new consultation which can improve both farm management and the environmental situation.

## **7.5 Advisory services by the industry or producers**

Some of the commercial companies are doing their own advisory work. There is good cooperation between LRATC and commercial companies in connection with promoting the most profitable and environmentally friendly solutions in agriculture. There are many educational seminars during winter and practical field days during the growing season as a result of this co-operation. LRATC crop advisors take part in the activities of processing companies, for example seminars for farmers organised by the potato starch company Aloja Agro.

The dairy and meat industry does not have any advisory organisation but LRATC cooperates with the Latvian Beef Cattle Breeding Association.

## **7.6 Contacts between research and advisory service**

### **7.6.1 List of research institutions**

The most relevant research institutions are:

- *State Stende Cereal Breeding Institute*  
Plant Breeding, Crop Management, Seed Breeding, Mechanisation, Laboratory, Fundamental Library, Sales Management
- *Agrochemical Research Centre*  
Soil analyses
- *Latvia University of Agriculture (LUA)* – Faculty of Agriculture; Faculty of Economics; Faculty of Technology; Faculty of Veterinary Medicine; Faculty of Rural Engineering; Faculty of Food Technologies; Faculty of Forestry; Faculty of Social Sciences; Faculty of Information Technologies.

Under Latvia University of Agriculture there are six institutions:

1. *LUA Skrivers Scientific Centre* – Evaluations of cultivation and use based on field trials and laboratory analyses for conventional and biological agriculture
2. *LUA Biotechnology and Veterinary Medicine Research Institute "Sigrā"*
3. *LUA Agricultural Machinery Research Centre "Ulbroka"*
4. *LUA Scientific Institute of Water Management and Land.*  
Agricultural impact on the environment and all aspects of water management related to agriculture

5. *LUA Research and Study Farm "Vecauce"* – animal breeding (dairy, sheep, beef cattle)
6. *LUA Research and Study Farm "Pēterlauki"* – crop farming.
  - The independent private advisory company *Scientific Agricultural Centre of Latgale*. It carries out field trials and other scientific research on crops.
  - The private company *State Priekuli Plant Breeding Station*. The Station has produced 101 new varieties of 31 different agricultural crops. Almost all main varieties cultivated in Latvia have been bred in Priekuli. The Station also carries out seed multiplication and other research in crop cultivation methods, participates in education activities and provide advisory services.

### 7.6.2 Contact channels and cooperation

There are formal and informal contacts between agricultural advisors and researchers, based on use of information technologies, common projects, local and international seminars and conferences. There are also regular meetings in the Ministry of Agriculture with working groups and boards.

Research institutions receive the LRATC Newsletter 'Rural Leaf' (*Lauku Lapa*) produced by the LRATC Department of Economics and Rural Development. The scientists are invited as lecturers and participants in training courses for agricultural and rural advisors.

There are annual publications such as Demonstration Results, where scientists give their professional comments on crop farming and animal breeding. Doctoral theses by LRATC advisors are elaborated upon in co-operation with research institutions.

## 7.7 National legislation on water protection

### 7.7.1 List of Latvian laws with ordinances and regulations

Cabinet Regulation No. 628 of 31 July 2004, amended by Cabinet Regulation No. 831 of 5 October 2004, on specific environmental requirements regarding performance of activities polluting the environment at animal holdings (unofficial translation).

The Code of Good Agricultural Practice, 1999.

Cabinet Regulation No. 118 of 12 March 2002 on surface and groundwater quality.

Cabinet Regulation No. 34 of 22 January 2002 on emissions of pollutants into the aquatic environment.

Cabinet Regulation 531 of 18 December 2001, amended by Cabinet Regulation No. 134 of 16 March 2004, on regulations on the protection of waters and soil against pollution caused by nitrates from agricultural sources.



Cabinet Regulation No. 294 of 26 July 2002 about A, B and C categories (only available in Latvian).

Law on Pollution of 29 March 2001.

Cabinet Regulation No. 163 of 18 March 2004 about designation of nitrate vulnerable zones (only available in Latvian).

Cabinet Regulation No. 235 of 29 April 2003 on mandatory harmless and quality requirements for drinking water, and the procedures for monitoring and control thereof (only available in Latvian).

Minister Order No. 58 of 18 February 2004 on the establishment and functions of the NVZ Board (only available in Latvian).

### 7.7.2 Supervision of agricultural producers

Main inspectorates and institutions:

*The State Environment Service* controls through laws and regulations the procurement and use of nature resources, environment protection, pollutant emissions to the environment, management of hazardous and household waste, performance of chemical products and other activities.

*The State Plant Protection Service* performs official control and surveillance in the field of free movement of plant protection products, fertilisers, plants and plant products, plant varieties, seed and planting material. Also involved in cross-compliance (CC) monitoring.

*The Rural Support Service* is a state administration institution. It is responsible for implementation of a unified state and European Union (EU) support policy in the sector of agriculture, forestry, fisheries and rural development; it supervises compliance of the sector with the laws and regulations and fulfils other functions connected with agriculture and implementation of rural support policy including the CC control system.

*The Food and Veterinary Service (FVS)* is a state administrative institution supervised by the Ministry of Agriculture. It ensures unified state surveillance and control over food circulation and the sector of veterinary medicine. Functions of FVS pursuant to the effective legislation and regulations include: food circulation control, veterinary surveillance and control, border sanitary control, laboratory investigations. Also involved in CC control.

*The State Breeding Inspection* is a civil institution subject to the Ministry of Agriculture and it has territorial structural units with breeding and milk quota inspectors. The Inspection polices compliance with the rules and regulations of Breeding Law and EU Legislation.

*Local Government.* The Latvian Association of Local and Regional Governments (LALRG) is an association unifying local and regional governments of the Republic of Latvia on a voluntary basis. The LALRG has the authority to represent local and regional governments in the

negotiations with the Cabinet of Ministers as the LALRG associates 528 members.

## **7.8 Relevant EU directives and programmes**

### **7.8.1 Nitrate Directive and Water Framework Directive**

Nitrate-vulnerable zones have been identified and one of the components in the action programmes introduced in these areas is a requirement for fertiliser plans to be prepared by all farms with a sowing area of 10 hectares or more.

The advisory service has developed GAP (see Chapter 5) and conducted specific training for farmers on this issue. More information about the Nitrate Directive is given in Chapter 5.

### **7.8.2 Integrated Pollution Prevention and Control (IPPC) Directive**

The Ministry of Agriculture keeps a register of IPPC installations, the permit procedure is announced and it is possible to comment on submitted applications. There are 12 IPPC pig farms in Latvia.

### **7.8.3 Cross-compliance regulations**

Under the National Programme 'Establishment of institutions providing advisory services to farmers and farm expansion services' there is a project for 2005-2007 on Development of Farm Advisory Systems. The aim is to increase the capacity of the LRATC to adapt the agricultural activity of farms to the European Union requirements concerning environmental protection etc. and to establish the advisory system on cross-compliance. A check-list has been developed which the advisors will use on farm visits to check compliance with the environmental, hygiene and animal welfare regulations.

## **7.9 Conclusions and recommendations**

The state-supported advisory organisation LRATC was developed in the early 1990s with a modern organisation and has successfully dominated the 'advisory market' since then, much like the Danish advisory service which stood as its model. There seem not to be many private actors apart from companies selling input goods and the processing industry. The advisory service is in high demand and there are not enough expert advisors, especially in animal production. In any case there is cooperation between the LRATC and these commercial actors and also with the few advisors connected with producers' groups. It appears unlikely that there will be large changes in the advisory structure in the near future.

As in Estonia, monitoring of watersheds shows that there is a risk for increased nitrogen losses in areas where agriculture has intensified in the last ten years. This problem is targeted in RDP 2007-2013 in the measure

‘environmentally friendly farming’ but evaluating whether this approach is sufficient was beyond the scope of this study.

The main focus of the Latvian Rural agriculture and training centre is continuing educational work for farmers and linking them with investment schemes, and for this purpose the Environmental Management System (EMS) has been developed. The advisory service should further develop this way of working and further improve its knowledge in the technical and economic expert areas necessary for the EMS approach, which are:

- Information about the status in the Baltic Sea
- Nutrient loads from different countries to the sea
- Nutrient flows
- Manure and pesticide handling
- Technical solutions
- Management
- Nutrient balance
- Checklist at the farm
- Theory of economical calculations
- Profit/loss, balance sheet
- Calculation of key figures.

## **8. Lithuania**

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### **8.1 Organisation and significance of the agricultural sector**

#### **8.1.1 General information on Lithuanian agriculture**

Agriculture in Lithuania is one of the priority sectors, playing an important economic, social and environmental role. Trade in agricultural and food products constitutes a significant share of Lithuanian foreign trade, 10.9 per cent of total export value in 2004 and 8.6 per cent of imports. Exports of agricultural and food products are increasing rapidly.

Some sectors (for example fibre flax growing, calf rearing) are deteriorating while others (for example energy crops) are becoming more popular. Although oilseed rape is a relatively new crop in Lithuania, it is expected to have a great potential in the future in the light of the increasing demand for biofuel. The average size of holdings is increasing and the number of organic farms is steadily increasing.

#### **8.1.2 Agricultural producers and production**

One-third of Lithuania's population lives in rural areas and 15.8 per cent of residents are employed in the agriculture, hunting, forestry and fishery sector. In rural areas, great dependence on primary economic activity of agricultural production prevails: in 2006, it employed 87.3 per cent of the country's agricultural, hunting, forestry, and fishery sector workers, which amounts to approximately 48 per cent of all employed residents of rural areas. In 2005 there were 252 946 farms, with an average farm size of 11.1 hectares. Of these, 252 404 were farmer-owned and family farms. The animal breeding sector is dominated by milk and meat production and contributes 49 per cent (2004) of the total agricultural production. Both milk and meat sectors are dominated by small-scale producers (on average 2.6 cows per farm) and this results in low labour productivity, low competitiveness of primary livestock production, and difficulties in complying with quality, hygiene, environmental and animal welfare requirements.

The main crops grown are wheat, rye, rape, flax, sugar beet, potatoes, fruits, and vegetables. Although the natural conditions are favourable, the production of main crops in Lithuania is still characterised by low yields and poor quality as a result of outdated technologies, lack of proper machinery, inadequate drying and storage facilities and packaging equipment (especially as regards vegetable and fruit and berry growers), use of poor quality seeds (currently only about 10-15 per cent of the total grain crop area is sown with certified seeds) and lack of farm management practices.

The food processing industry is one of the largest industry branches in Lithuania. More than 70 per cent of food production is consumed on the

domestic market. The main products for export are milk and milk products – in 2004 these made up about 29 per cent of the total exports from agricultural production. The main markets for exports are the EU countries and Russia.

### 8.1.3 Producers' organisations

Agricultural producers in Lithuania are combined within the Chamber of Agriculture of the Republic of Lithuania (CARL). Today CARL unites more than 100 territorial and branch organisations of farmers, agricultural processors and other non-profit organisations that have an influence on rural economy and social life. Crop sector organisations comprise 14 associations for different products and animal husbandry organisations comprise 15 associations.

## 8.2 Environmental effects of Lithuanian agriculture

### 8.2.1 Overall description of effects

There are large karst areas which are particularly vulnerable to pollution of the groundwater, for example the Northern Lithuanian Karst Area which covers one-fifth of the total territory (Fig. 26).

The large state and collective farms in the Soviet era used slurry manure systems in the livestock production but often had inadequate storage and handling which resulted in water pollution. The change of the economic system and the break-up of the state and collective farms as a result of the land reforms in the early 1990s led to a sharp decline in the use of mineral fertilisers and livestock production, on the one hand. On the other hand, there was considerable fragmentation in livestock production. Despite an overall drop in the level of production, nitrate concentrations actually increased in water sources, more in the most intensive agricultural regions. Since late 1990s production has started to increase again and the number of farms has increased as well. In areas particularly prone to leaching specific restrictions were introduced already in the late 1990s.

Almost all water flowing into the Baltic Sea from Lithuania comes with Curonian Lagoon water, a highly eutrophied water body. It has limited exchange of water with the Baltic Sea and its status directly depends on the quality and flow of the River Nemunas.

Lithuania uses underground water to provide the population with drinking water from aquifers that are relatively protected from surface pollution. However, over 950 000 rural inhabitants use water from shallow wells with a nitrate concentration often exceeding the maximum allowed concentration, and sometimes amounting to 100 mg/L and more. The polluted wells are scattered evenly throughout the whole country. The main reason for pollution of well water with nitrates is inadequate distances from barns, dunghills, toilets, heavily fertilised orchards and gardens.

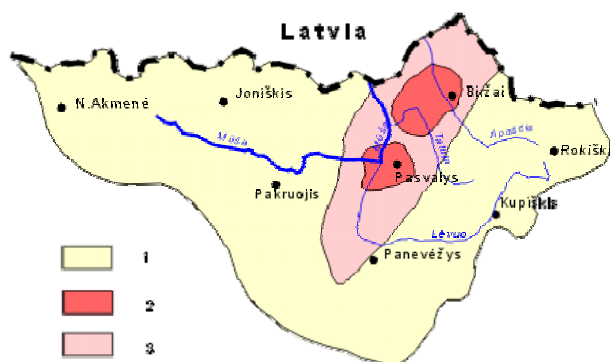


Fig. 26. Karst regions of Lithuania.

Source: *Rules and Recommendations In Advanced farming*. Lithuanian Water Management inst., 2000.

Lithuania is characterised by a wide biodiversity, where 24-25 000 species can be found, but many species of flora and fauna are rare, threatened or approaching extinction. Within the Natura 2000 network, there are currently about 13 000 hectares of agricultural land with restrictions on actual farming practices such as drainage, ploughing, livestock density and the use of fertilisers and pesticides.

### 8.2.2 Results of monitoring programmes

Through the Baltic Environmental Agricultural Run-off Project (BEAROP), which is part of the Baltic Agricultural Run-off Action Programme (BAAP), a number of demonstration catchments have been established. In Lithuania three catchments were included in the surface water monitoring programme; Lyžena, Graisupis and Vardas (Fig. 19). A monitoring programme for shallow groundwater was also established in the catchments. Drainage field experiments and plot trials were carried out in the Graisupis watershed to quantify the effects of different farming practices on nutrient leaching. Sampling of water in private drinking water wells was also carried out.

The conclusion from monitoring of small watersheds was that total nitrogen concentration in stream water depends on the intensity of agricultural activity and natural conditions, mainly water runoff. High concentrations of total phosphorus in the Graisupis stream indicate that its losses depend mainly on phosphorus content in soil, which is largest in the Graisupis area.

As for the total load of nitrogen, the pattern of flow-normalised loads for the Graisupis and Lyžena streams (Fig. 27) shows an upward trend of 10.2 and 67 per cent respectively for 11 years of monitoring. This upward trend can be attributed to increased fertilisation and ploughing of pasture in the Lyžena AMW. If losses in 2006 were excluded, the upward trend in Lyžena would be only 10.1 per cent. From the beginning of monitoring activity in 1995 to 2006, nitrogen input for all crops in Graisupis and Lyžena area increased by 150 per cent and phosphorus increased by 9 per cent. In the Vardas watershed, nitrogen and phosphorus inputs decreased by 59 and 64 per cent respectively, causing a downward trend of N-total flow-normalised load.

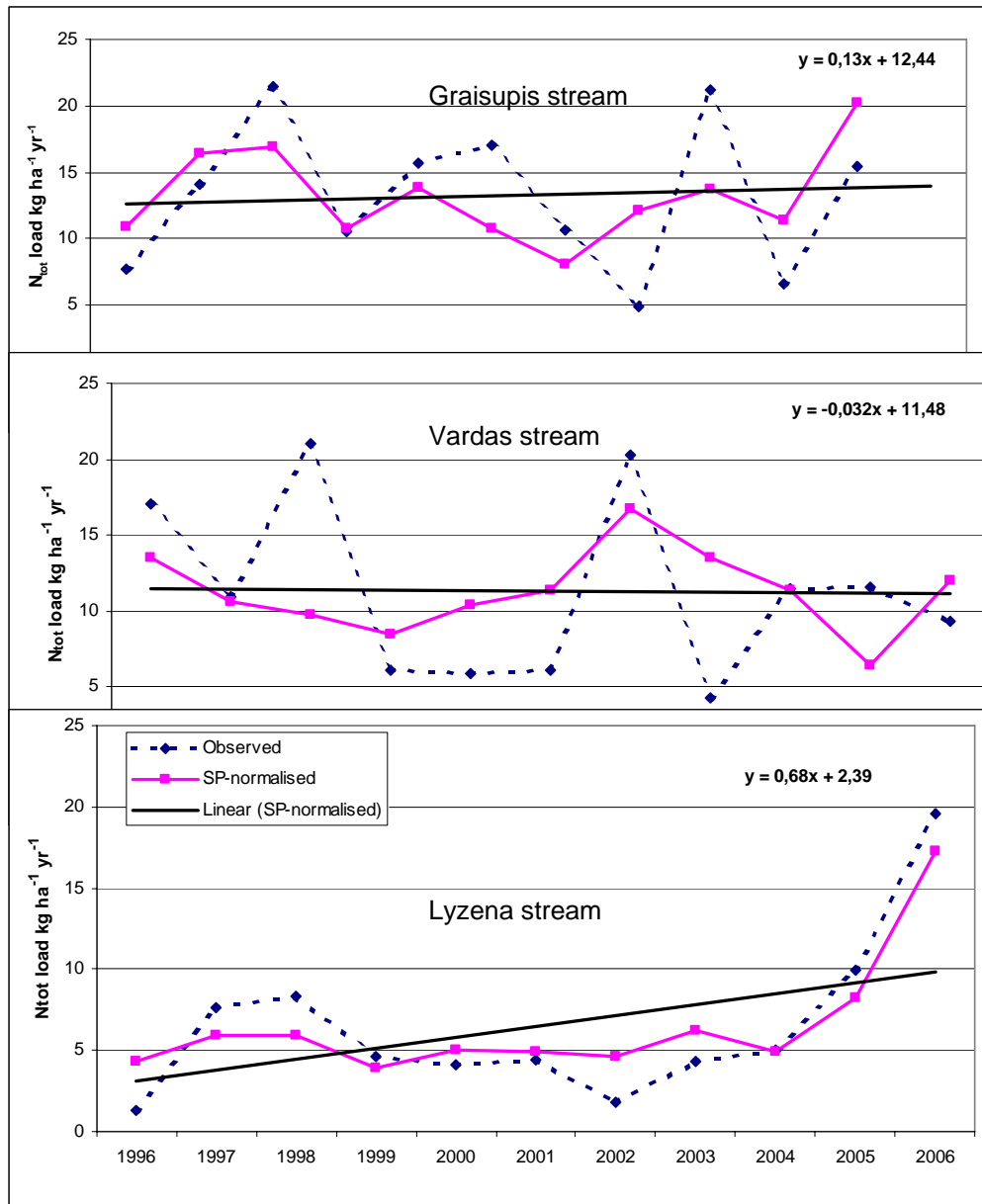


Fig. 27. Measured and flow-normalised loads in the Graisupis, Vardas and Lyžena streams.

One agricultural company, Bariunai, was selected for monitoring of the effects of improved manure management on nutrient leaching. The main form of production at the company is milk and livestock breeding. The company owns 600 dairy cows in addition to 3 000 pigs and 4 000 weaners. The conclusion from this study was that construction of manure storage for accumulation of manure and slurry for the entire housed period and prevention of rainwater entering manure storage could reduce nutrient load to drainage water significantly (Fig. 28).

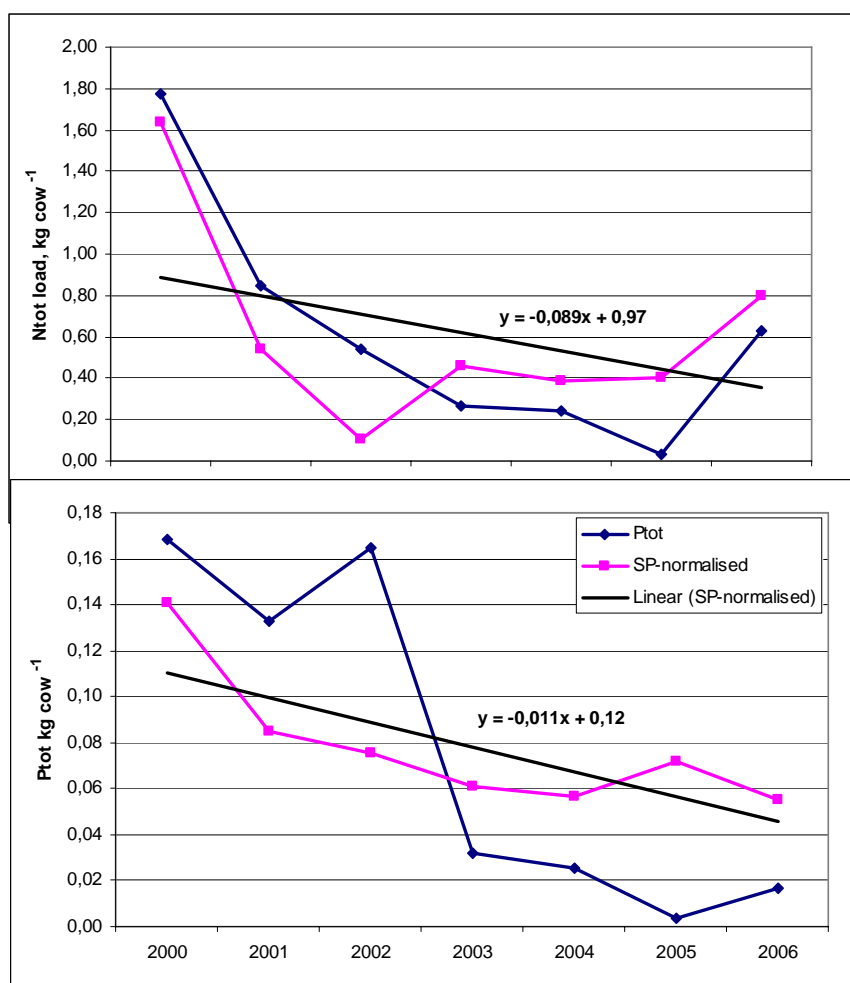


Fig. 28. Measured and flow-normalised N-tot and P-tot loads in drainage from cow barn and manure storage at Bariunai AC. The manure storage was built in 2000.

### 8.2.3 National objectives concerning agriculture

The Strategy Plan for Rural Development 2007-2013 is one of the basic documents outlining the policy. The vision of the Lithuanian rural development for 2013 is described below, with the parts relating to the environment described more in detail:

- Improve the competitiveness of agriculture and forestry by supporting restructuring, development and innovation.
- Improve the environment and landscape by supporting environmentally friendly methods of land management.
  - Existing biodiversity values, landscape and other environmental values (water, including drinking water from dug



wells, air) will be preserved and enhanced whenever possible through increased.

- Those performing economic activities within Natura 2000 and other high nature value areas (agricultural land, forests) will be encouraged to apply defined/recommended farming methods.

The awareness of farmers and forest owners about their role and possibilities in preserving nature will be increased through training and improved access to information.

- Forestry development (including afforestation) will be performed in a manner that will ensure that economic, ecological and social values and needs are balanced.
- Through modernisation of primary and processing industries the use of renewable energy sources will increase. Renewable energy sources are expected to constitute 12-15 per cent, of which 10-12 per cent will be bioenergy.

- Improve the quality of life in rural areas and encourage the diversification of economic activities.

### **8.3 Organisation of the independent advisory service**

State policy in the fields of training, advice provision and education of people working in the agricultural sector is implemented by the Department of Information and Rural Development of the Ministry of Agriculture.

Until 2004, two organisations for advisory activities, *Lithuanian Agricultural Advisory Service (LAAS)* and *Lithuanian Chamber of Agriculture* were supported. Since 2004, when advisory services in Rural Development Programme (RDP) 2004-2006 were supported, the number of consultation organisations registered has increased to 44 accredited consulting organisations serving farmers and the public in rural areas.

LAAS, by far the largest advisory organisation, has 48 offices all over the county, each employing 2-9 specialists providing qualified services and consultations in traditional plant-growing, cattle breeding, accounting and farm economics, construction and mechanisation of agricultural buildings, etc.

The technological services include:

- Taking soil and forage samples
- Preparation of crop structure, fertilising and crop protection plans
- Evaluation of crop situation and recommendations
- Mapping of crop area with GPS equipment
- Preparation of feeding plans
- Calculation of feed needs

- Preparation of animal movement, grazing management and feeding plans
- Preparation of documents for dairy farm certification
- Checking and calibrating of agricultural machinery
- Assessment and analysis of technologies and investments in agricultural machinery
- Calculation of machinery costs
- Evaluation of manure storages
- Preparation of environmental parts of building designs
- Preparation of documents on safety and health of employees.

The economic services include:

- Keeping of farm books and accounts
- Evaluation of farm economic viability
- Preparation of business plans
- Long-term supervision of business plans
- Preparation of reporting documents on purchases
- Filling in application forms.

In 2006, LAAS advisors served farmers with more than 115 000 individual advice sessions, 306 seminars were organised where 6 053 farmers participated, and 164 field days were organised with 2 492 participants. During 2006, 30 field trials concerning plant production and animal husbandry themes were organised and 546 articles and 719 information leaflets were prepared.

The ‘Centre for the LEADER Programme and Farmers’ Training Methodology’ under the Ministry of Agriculture of the Republic of Lithuania is responsible for:

1. Coordination of long-term vocational training of farmers and other inhabitants of the countryside.
2. Organisation of seminars, courses, conferences tailored for administration, financial management, drafting of environmental and integrated rural development strategies etc. for Local Action Groups (LAG).

Through the funds of RDP 2007-2013, 27 accredited consulting organisations and more than 400 advisors will be supported for consultancy services. The main institutions providing the consultancy services are the Lithuanian Chamber of Agriculture targeting broader rural development issues, and the LAAS targeting production and environmental issues.

## **8.4 Ongoing advisory programmes**

### **8.4.1 RDP 2006-2007**

During 2006-2007, advisory programmes in LAAS, under the Single Programming Document 'Rural Development and Fishery Training' measure, improved knowledge and experience of farmers for better implementation of environmental, hygiene and technological requirements on farm level. The following courses for farmers were carried out:

- Training of pesticide users with the objective to improve 'knowledge concerning proper use of chemicals'. 23 courses in 18 districts and total of 380 participants.
- 'Consumer requirements on drinking water and artesian wells', 2 seminars in 2 districts, total of 32 participants.
- 'Manure and waste handling', 31 courses in 22 districts and 550 participants.
- 'Environmental Protection in Agriculture' with the objective of increasing awareness of environmental problems in agriculture. 2 seminars in 2 districts and total of 114 participants.
- 'Implementation of requirements for sustainable farming' – 7 courses in 6 districts, 114 participants.
- 'Water management in agriculture' in Kazlų Rūda municipality, 16 participants.
- Training to carry out technical inspection of pesticide sprayers, 17 courses in 16 districts, total of 267 participants.

### **8.4.2 Successful approach in advisory programmes**

In general, Lithuanian farmers have good access to consultations of a general nature in the area of traditional production methods, farm economics and accounting.

LAAS is taking an active role in organising contests among farmers or farming activities. 'Farm of the Year' is organised in all districts in Lithuania, 'Milk Producer Competition' is organised in 9 districts, and 'Ploughing Contest' is organised in 17 districts, influencing farmers to align to the best practice in their districts.

According to a survey in 2003, more than half of the farmers used LAAS to prepare business plans for SAPARD support, while the rest either used private companies or prepared the plans by themselves.

Information that is most important according to farmers' opinion is listed in order of priority:

1. Plant production technologies
2. Use of Rural Development Plan support
3. Animal husbandry technologies
4. Agricultural machinery needs
5. Building construction
6. Animal welfare improvements
7. Quality of production
8. Organic agriculture
9. Work safety improvements
10. Environmental improvements

In 2007, a survey of farmers was conducted to again evaluate the quality of advisory services. A large majority of the farmers rated LAAS advisory consultations as good. In that survey, most needed consultations for farmers were:

- Filling of applications for RDP and Single Programming Document (SPD) support and business plans
- Good agricultural practice requirements
- Hygiene and animal welfare requirements.

In comparison with the survey organised in 2003, it was apparent that environmental questions and implementation of environmental requirements had become a more important issue for farmers.

Currently 36 per cent of farmers have primary education, 29 per cent secondary, 31 per cent upper secondary with a vocational qualification and only 4 per cent have higher education. New graduates with agricultural education tend to seek employment in sectors other than agriculture, and thus the older and less educated farmers dominate. Taking into account the demographic structure amongst farmers, the need for vocational education is increasing.

#### **8.4.3 Problems experienced in advisory programmes**

One of the main problems in LAAS is that it is quite difficult to retain highly qualified specialists. It is common for qualified advisors to move to another organisation (private companies, banks, government institutions).

There are quite low numbers of advisors in comparison to the number of farmers. On the labour market, there is a lack of professional advisory services. New private advisory companies often 'buy' existing advisors from LAAS.

The implementation of some new innovative advice is sometimes limited because of the different education level of farmers, development levels of farms and farmers' needs.

There is a lack of specialised consultations and training in the field of organic farming and implementation of environmental and other requirements, community development and partnership (in particular as regards implementation of LEADER type actions), and in the field of marketing and diversification of economic activities.

## **8.5 Contacts between research and advisory service**

### **8.5.1 Short description of the most relevant research institutions**

*The Lithuanian Veterinary Academy (LVA).* Higher education at university level, training veterinary surgeons and animal husbandry technologists. The academy had a student body of 1 561, including 50 post-graduate students.

*The Lithuanian University of Agriculture (LŽŪU).* The only institution of higher education in Lithuania where highly qualified specialists of agriculture, forestry and water management are trained. Research in the fields of agriculture, forestry and water and land management. At present more than 7 000 students, 400 teaching staff and 250 professors and docents. Five faculties: Agronomy, Economics and Marketing, Forestry, Water Management and Land Planning, and Agricultural Engineering.

*The Lithuanian Institute of Agriculture, in Dotnuva.* Fundamental and applied field trials in eight departments: Soil and Crop Management, Plant Nutrition and Agroecology, Plant Pathology and Protection, Cereal Breeding, Grass Breeding, Laboratory of Genetics and Physiology, Chemical Research Laboratory, and Division of Apiculture.

*The Lithuanian Institute of Horticulture.* Scientific work is organised in three scientific departments and three laboratories.

*The Lithuanian Institute of Agrarian Economics under the Ministry of Agriculture.* High importance is placed on analysis and prognosis of micro- and macro-processes in the field of scientific research and information management as well as on agricultural and rural development.

*The Institute of Agricultural Engineering, Lithuanian Institute of Agriculture.* Main trends of scientific researches include physical-mechanical and chemical influence of agricultural technologies on the environment, creation and optimising production processes and engineering methods and renewable energy from plants and waste material.

*The Institute of Animal Science of Lithuanian Veterinary Academy.* A state budgetary research institution with the status of a university scientific institute, established for fundamental and applied research in zoology and biology on international and national level in the field of bio-medical sciences.

*The Water Management Institute of Lithuanian University of Agriculture.*  
Research on the impact of agricultural production on the environment and development of water conservation methods; research on the functionality of drainage systems.

### **8.5.2 Contacts channels and communication**

Scientific institutions are located mainly in the centre of Lithuania but there are branches and stations in other regions of Lithuania and close cooperation with local advisory offices is common. There are some personnel from scientific organisations in the Advisory Service and some institutions have working staff from the Advisory Service. Personal contact gives more possibilities for successful formal communications. Typical cooperation activities are:

- Preparation of training programmes on meat production, organic animal husbandry, preparation of methodology for the field trials
- Plant production field trials, methodology, horticultural crops
- Compiling information material, booklets, articles and videos
- Organisation of the annual show ‘Agrovizija’
- Preparation of building drawings, methodology support for constructional solutions
- Different environmental projects.

## **8.6 National legislation on water protection**

### **8.6.1 List of Lithuanian laws with ordinances and regulations** IPPC Act of February 2002.

Governmental order for programme of minimising pollution from agriculture No 1076, 2003 26 August. The document describes action plans that should be taken to minimise pollution of agricultural origin.

Order of Agricultural Minister No 3D -431, 2004 16 July: Good Agricultural Practices requirements: Animal density, animal welfare requirements, manure capacity requirements, usage of organic fertilisers; water protection zones.

Order of Agricultural Minister No 3D-148 2007 April 5. Good Agricultural Practice according to Rural Development Plan: Animal density, manure handling, use of pesticides, farm outlook, animal disease prevention.

Order of Minister of Environment No D1-98 14 February 2007. Water protection zone requirements.

Environmental requirements for manure handling 2005 14 July Nr D1-367/3D-342. By 2008 all holdings with more than 300 livestock units must have adequate manure storage.

## 8.6.2 Supervision of agricultural producers

During the Soviet era, environmental inspection was limited to a number of very large farms whereas today, as a result of the land reform, there is a wide range of sizes from very small farms to large agricultural holdings. For large farms there is a system of operator self-monitoring. Farms with more than 500 livestock units must prepare a water protection plan and farms with more than 200 livestock units must have a system of monitoring of production of slurry and urine, field drainage and surface water. Farms which use more than 10 m<sup>3</sup> water per day have to obtain a licence for use of natural resources.

*Regional Environmental Protection Agency.* Waste/pesticide use and manure handling. Usually visits farms when there is a threat of obvious environmental problems.

*State Seed and Grain Service under the Ministry of Agriculture.* Quality of seed, grain and feed.

*State Plant Protection Service.* Responsible for the state plant health policy. Registration of plant protection products. Controls on-farm handling of plant protection products and the testing of sprayers.

*State Food and Veterinary Service.* Develops and implements the Government's policy in food safety and quality as well as in animal health and welfare. Performs inspections in the field of safety, hygiene and traceability of food and feed in processing, packaging and distribution 'from stable/field to table'.

## 8.7 Relevant EU directives and programmes

### 8.7.1 Nitrate Directive and Water Framework Directive

The implementation of the Nitrate Directive as well as the Water Framework Directive (WFD) has been given a high priority in Lithuania. Agriculture is considered to be one of the key non-point water pollution sources. However the difficulty in distinguishing between non-agricultural and agricultural induced pollution, the large particularly fragile karst areas and the fact that high nitrate levels are found all over Lithuania in shallow wells led to the decision to designate the whole territory as a nitrate vulnerable zone. This means that action programmes including training of farmers must be conducted all over the country. Most of the courses and trainings for farmers mentioned earlier focused on the problems with nitrate losses from agriculture. Success in reducing pollution depends very much on awareness of many small farmers of the risk connected with the manure handling, especially slurry systems. However, due to the high costs, it is expected that many of the smallest farms will never acquire adequate manure storage.

Of a total of 790 water bodies identified for the implementation of WFD in Lithuania as those at risk that good status will not be achieved by 2015,

22 per cent of these have been identified as bodies at risk due to impacts from agriculture (pollution by nutrients, organic substances).

#### 8.7.2 Integrated Pollution Prevention and Control (IPPC) Directive

The new IPPC unit in the Environmental Protection Agency started operating from 2003 and BAT guidelines have been prepared. Currently there are 16 industrial pig farms. The environmental impact assessment is announced but there are no active information activities and the public comments are often not considered relevant.

#### 8.7.3 Cross-compliance regulations

A system for evaluation of cross-compliance status at farm level is under preparation. 232 LAAS advisors are accredited for services according to RDP 2007-2013, including economic advisors who will prepare applications for farmers to participate in RDP support measures. So far around 230 applications for Measure 3 'Setting up of young farmers' have been prepared by LAAS.

### 8.8 Conclusions and recommendations

The advisory service is very much dependent on EU policy and programmes simply because this is almost a foundation for farming activities and the advisory service is gradually adapting to meet the changing requirements.

There has not been much focus on the nutrient losses from crop cultivation previously but now this is considered a rising problem, at least in some intensive agricultural areas. For the beneficiaries of Measure 214 'Agri-environment' in the new RDP 2007-2013, fertiliser plans are obligatory and there will be a need to increase the activities in this area. The problem with polluted shallow groundwater and increasing nitrogen losses in areas where agriculture has intensified in the recent ten years is also targeted in Measure 214 but even more so in Measure 121 'Modernisation of agricultural holdings'. Part of this measure is designated to support the building of adequate manure storage to comply with the requirements of the Nitrate Directive and to reduce the number of polluted ponds and wells.

Measure 214 contains 'the landscape stewardship scheme' for which the objective is to maintain meadows and wetlands in order to protect the biodiversity.

Within these two measures/schemes, there seem to be need for experts in nutrient utilisation in crop production, grassland management for biodiversity and farm buildings/engineering.

Measure 214 also includes organic farming and in this field there is a lack of experts.



## **9. Poland**

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### **9.1 Organisation and significance of the agricultural sector**

#### **9.1.1 General information about Polish agriculture**

There has been a higher degree of continuity in rural and administrative structures in Poland than in Lithuania, Latvia and Estonia, and the strong tradition of family farms going back centuries was disturbed only to a small extent by nationalisation and collectivisation during the socialist era.

In large parts of Poland the basic economy is strongly linked to the agricultural sector, although the percentage of the population employed in agriculture is expected to decrease to 11 per cent in 2015. Due to lack of specialisation, the poor economy in individual holdings, excess of labour, low education level and insufficient equipment, the productivity of Polish agriculture is low. There is 40 per cent unemployment in the rural population as compared with 14-18 per cent in the country as a whole and the disposable income of representative rural families is 30 per cent lower than the income of urban families. In Poland, agriculture is regarded as having a disadvantage compared with the rest of Europe as a result of unfavourable natural conditions such as light, acidic soils, poor rainfall and short growing season.

In spite of this, Poland is an important producer of a number of agricultural products. In Poland, meat production is the most important agricultural output. The number of cattle and pigs decreased for at least 10 years after the end of the socialist era but there has been a tendency during recent years for the number to stabilise or even increase. The livestock density has decreased by 33 per cent since 1990.

The food industry is one of the key sectors in Poland. However, relations between primary producers and the industry are weak and limit the productivity of the sector, and this is why the formation of producer groups is strongly promoted by the government. Following a short-term decrease after accession to the EU, the food industry is currently growing at 5-6 per cent annually due to growing exports and national demand.

#### **9.1.2 Producers' organisations**

There are at least 67 producers' organisations in Poland, at least one for each type of agricultural product such as grain, beef, pigs, seed, etc., all more or less independent of one another.

The largest social and professional organisation for agriculture is the National Union of Farmers, Cooperatives and Agricultural Organisations (Krajowy Związek Rolników, Kólek i Organizacji Rolniczych, KZRKiOR). This is an association of agricultural circles with about 1.2 million members

and rural housewives' circles with 850 000 members. The objectives and activities overlap with the activities of the agricultural chambers. KZRKiOR is a member of COPA GOGECA and, like the two political 'farmers' parties' is lobbying for the Polish farmers in the EU.

The strongest farmers' organisation on national level is probably the Agricultural Chamber (Izba Rolnicza). This organisation is based on specific legislation, the Agricultural Chambers Act, and is organised primarily on voivodship (regional) level but also with a more local organisation, as well as a national association. The Agricultural Chamber is financed through the agricultural tax (land tax) or income tax from a special section of agricultural production and membership is thereby obligatory. The overall role of the Agricultural Chamber is to represent farmers versus the government and local authorities regarding general agricultural matters. The Agricultural Chamber contributes in the process of restructuring of Polish agriculture, participates in tender commissions, lobbies for the creation of producer groups and negotiates with representatives of the processing and trade industry. Furthermore, the chamber participates in meetings, seminars and training sessions for farmers in the regions, co-organises and participates in exhibitions, fairs and other agricultural promotion events, undertakes advisory activities, especially in legal matters, direct payments and SAPARD applications, and participates in national and international development projects. The Agricultural Chamber is a member of COPA.

## **9.2 Environmental effects of Polish agriculture**

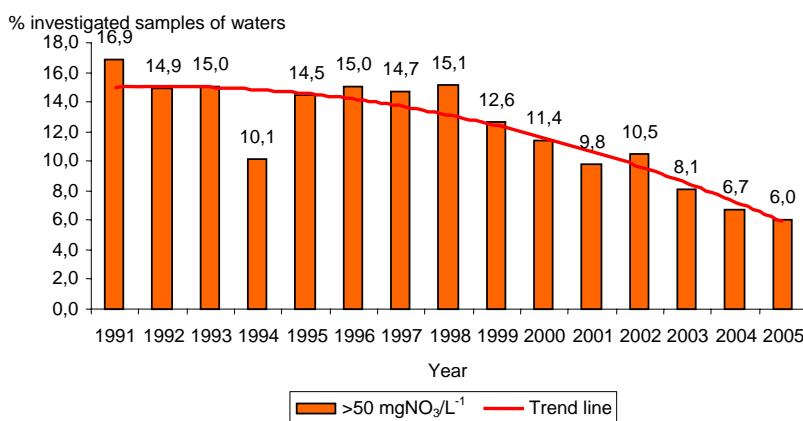
### **9.2.1 Overall description of effects**

Due to the lack of specialisation and less intensive production methods, biodiversity is well preserved in the agricultural landscape. The threats to biodiversity from the development of modern, intensive agricultural methods are often mentioned as the greatest environmental problem in Polish agriculture. It is stressed that both advisors and EU support payment agencies need to be competent in management of farmland for biodiversity. There are already unploughed buffer zones along streams, there are non-sprayed zones between cropped fields and there is a lot of extensively used permanent pasture. The western European drainage activities for the last 100 years, which have converted small streams into closed drainage systems with pipes, have not occurred to the same extent in Poland. Instead, there are a lot of small open streams.

On the other hand a large part of the total land area consists of agricultural land and a large proportion of the population lives on small farm holdings where manure is stored directly on the ground or on inadequate manure pits and in small urine tanks. In addition, the sanitation facilities are poor. It is not expected that all the small farmers will be able to acquire proper manure management, even with financial support. The quality of the shallow groundwater is in many cases low and as a result the municipal water supply

system has been extended during recent decades and now reaches more than 50 per cent of rural households. However, the other 50 per cent of rural households rely on poor quality drinking water from shallow wells. Agriculture is both a diffuse source of pollution and consists of many small point sources. However, the number of groundwater samples exceeding the value  $50 \text{ mg NO}_3 \text{ L}^{-1}$  has decreased in the period 1991-2005 according to the national monitoring results (Fig. 29).

Depending on the source, it is estimated that between 45 and 60 per cent of the total N load and 30-40 per cent of the total P load from Poland into the Baltic Sea originates from agricultural sources. According to Polish monitoring (also in the HELCOM reports, see Chapter 4) the total amount of nitrogen and phosphorus discharged into the Baltic Sea has decreased in recent years (Figs. 30 and 31).



*Fig. 29. Nitrates in underground water in general according to monitoring results from the period 1991-2005 in the section of concentrations > 50 mg NO<sub>3</sub>/L.*

*(Pietrzak 2007, on the basis of: Informacja o realizacji zadań Inspekcji Ochrony Środowiska w 2003, 2004 and 2005)*

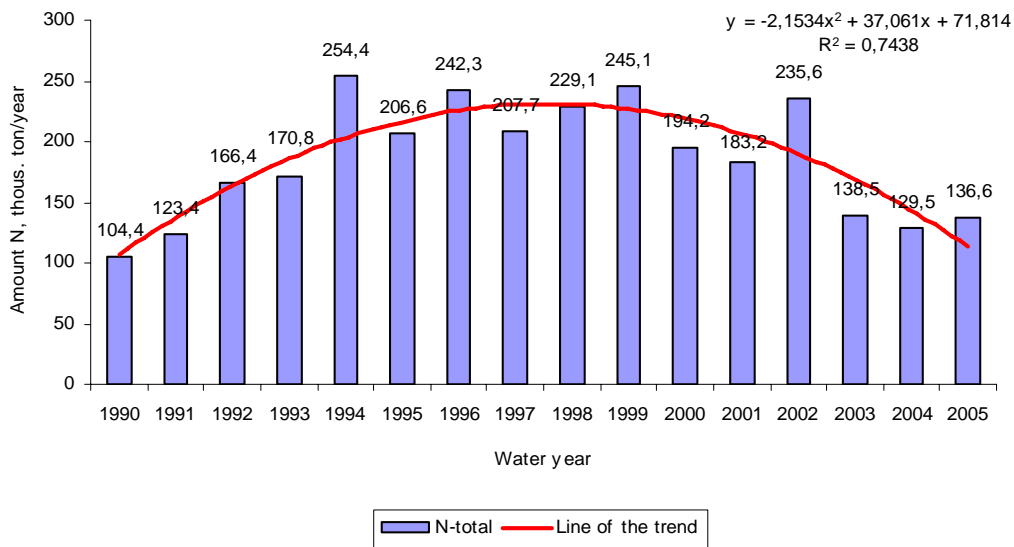


Fig. 30. Changes in the amounts of nitrogen (kilotonnes/year) from the land area of Poland discharged into the Baltic Sea in the period 1990-2005.

(Pietrzak 2007, on the basis of: Ochrona środowiska 1999, and 2005. GUS.)

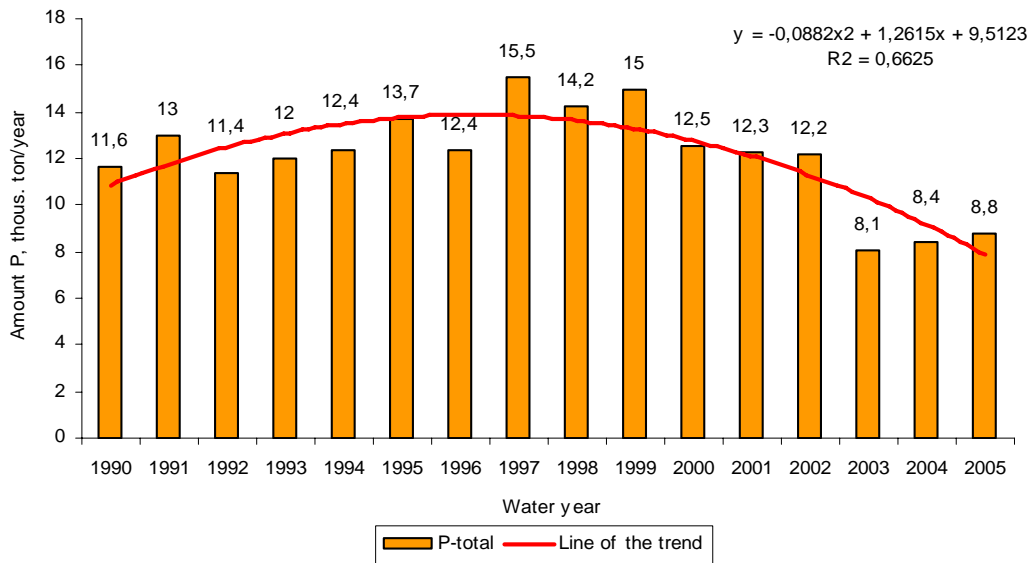


Fig. 31. Changes in the amounts of phosphorus (kilotonnes/year) from the land area of Poland discharged into the Baltic Sea in the period 1990-2005.

(Pietrzak 2007, on the basis of: Ochrona środowiska 1999, and 2005. GUS.)

To compensate for the low natural fertility of Polish soils, the recommended phosphorus fertiliser rate is traditionally rather high, not necessarily implying that the actual use is high. Due to the poor economy in agriculture,

the use of fertiliser was rather low during the early post-socialist years, but is now increasing (Fig. 32).

The gross national nitrogen balance increased from a 42 per cent to 55 per cent surplus in the period 1995-2003 but decreased in 2004 and 2005 to 42 and 49 per cent respectively. This rather low surplus is due to lower input of nitrogen fertiliser. However, as for phosphorus (and potassium), the input of nitrogen is slowly increasing.

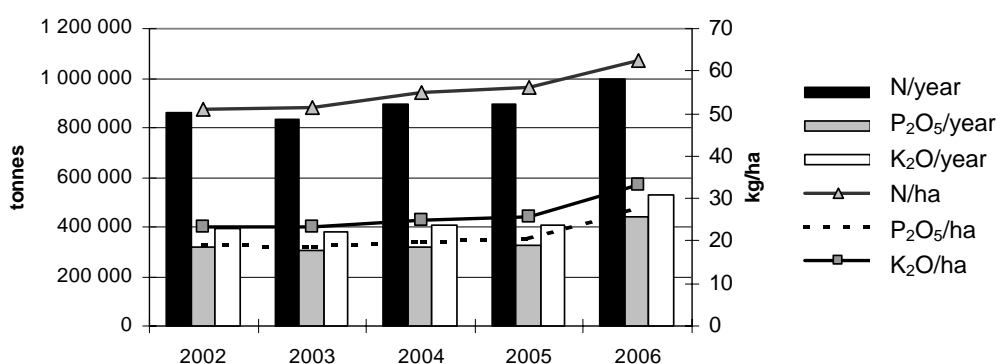


Fig. 32. Amount (tonnes) of fertiliser nitrogen, phosphorus and potassium used per hectare and year in Poland, 2002-2006.

The use of pesticides in Poland is shown in Table 10 (tonnes of active ingredient).

Table 10. Amount of different kinds of pesticides used per year (tonnes of active ingredient)

	Insecticides	Fungicides	Herbicides	Other	Total
Total, tonnes	1 957	11 068	25 936	4 984	43 945

Source: GUS. Rolnictwo w 2006 r.

### 9.2.2. National objectives as regards agriculture

In the Rural Development Programme (RDP) 2004-2006, the objectives were:

- Improvement of the competitiveness of the agri-food economy
  - Increase in the economic effectiveness of agricultural holdings
  - Improvement of incomes in agriculture and rural areas
  - Improvement of food safety, quality and market orientation of production.
- Sustainable development of rural areas

- Equalisation of opportunities for rural development
- Reduction of rural unemployment
- Improvement of living conditions, economic and social functions of rural areas
- Environmental protection and preservation of the natural value of rural areas
- Extension of woodland areas in Poland.

In RDP 2007-2013, the Polish priorities are very similar but regarding the environment there are two new priorities:

- Implementation of the cross-compliance principle
- Protection of biodiversity.

### **9.3 Organisation of the independent advisory service**

Basically, the current structure of the advisory service was formed after World War II, when the advisory service was re-established under the Chamber of Agriculture. Thereafter the advisory service has been reorganised several times and has alternated between regional and local public administration, as well as farmers' associations.

In the socialist era, the advisory service not only aimed at increasing agricultural production but was also involved with many administrative tasks and the advisors were identified with the negatively perceived authorities.

There were 10 000 advisors employed in the 49 voivodships, working closely with certain model farms as well being agricultural producers on the thousands of hectares of state farm on which these were situated, and they had very little to do with the majority of farmers. The main objective of the advisory service was increasing agricultural production irrespective of the economics, in order to make the country self-sufficient.

The poor links between science and the agricultural education system impeded the transfer of achievements from science to practice and substantially reduced the efficiency of the advisory service.

In the early 1990s, the need for a new strategy for the agricultural sector was recognised and total reform of the advisory service took place with support from foreign countries, especially the USA and Denmark. The reformed advisory service was intended to satisfy the needs of farmers and other rural households, while administrative, political and control functions were ruled out. Programmes on economics, social aspects, entrepreneurship, leadership, development of local societies, multifunctional rural development, diversification of income and organic agricultural production became priorities. Business plans became a speciality for the advisory service.

As a result of the administrative reform in Poland in 1999, the advisory service was reorganised into 22 public regional advisory centres and 7 expert offices that aim to serve not only the public advisory service but also

the newly developed advisory services created by farmers' organisations and private consultants providing services to processing companies, farmers' unions, associations of producers and businesses.

It should be stressed that the Polish advisory service is undergoing changes typical of countries with a developed market economy in agriculture. New forms of advisory service are developing under different institutions including farmers' organisations, but the public advisory service is still dominant. Other possibilities for education of farmers and the rural population are provided by R&D institutes belonging to the *Ministry of Agriculture and Rural Development (MARD)*, universities and colleges, agricultural vocational schools, foundations, associations and regional development agencies.

There are currently sixteen *Voivodship Advisory Service Centres (VASC)*, one in each voivodship and directly under the voivodship administration and responsible for the advisory service to the farmers. There are 30 branches, often on *powiat* (between municipal and regional) level and 313 local offices on *gmina* (municipal) level.

*The Agricultural Advisory Centre (AAC)* in Brwinow with branches in Kraków, Poznań and Radom directly under the Ministry of Agriculture and Rural Development, is responsible for training and development of the advisory service in the whole country.

The respective boards for these organisations include representatives for the MARD (the national organisation) or the voivodship administration (the regional organisations), the Chamber of Agriculture, farmers' unions, research and development units and agricultural schools.

### 9.3.1 Staff employed in advisory units

In the first half of 2007, the advisory units employed over 5 619 people, of which 193 were employed by the Agricultural Advisory Centre in Brwinow (Fig. 33). As a national average and in both organisations, 80 per cent of the personnel are advisors and managers and the others have administrative tasks. The number of employees in the VASC varies between the voivodships, normally between 200 and 400 persons.

### 9.3.2 Tasks of the advisory service units

Consultancy has focused mainly on preparing the farmers for integration with the EU and facilitating applications for EU funding, which is why all farmers make use of the consultancy service.

Current tasks of advisory units:

- Advisory assistance in implementation of the technologies for improving quality standards, environmental conditions and animal welfare
- Farm management
- Development of organic farming

- Assistance in organising farmers in producer groups, farmers' associations
- Supporting the multifunctional development of rural areas, vocational activation of country dwellers, and especially members of farming families due to finding additional and/or alternative sources of income
- Improving professional qualifications of farmers and country dwellers in the above-mentioned activities

The funding for the advisory service comes from a combination of national budget and commercial activities.

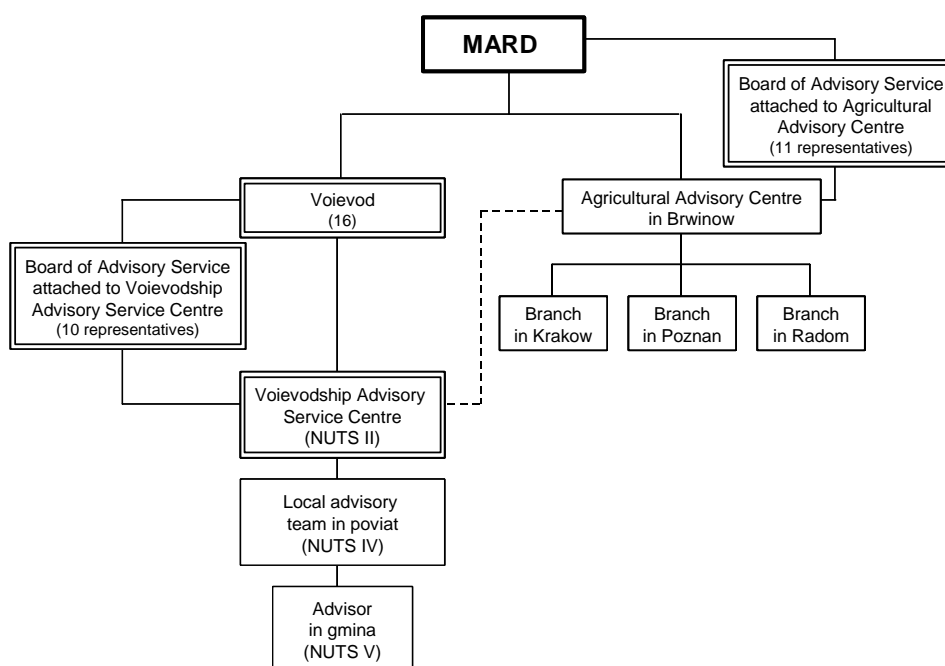


Fig. 33. Organisational scheme of the Polish advisory service.

### 9.3.3 Qualification demands on agricultural advisors

Agricultural advisors should have a university degree, least one year's work experience and at least one year of vocational or/and professional courses/graduate training.

About 76 per cent of the advisory staff have post-graduate qualifications, which apart from universities can also be obtained at professional R&D institutes and at the Agricultural Advisory Service Centre in Brwinow.

Improvement of knowledge and skills of advisors is provided in different forms: seminars, training courses, workshops in demonstration plots and farms. Since 2004, a distance learning education course has started using the



Internet. Participation is mainly voluntary but part of the advisory service requires specific courses or certificates. The agri-environmental advisors need to pass obligatory training and certification held by the Agricultural Advisory Centre in Brwinow. By October 2007, a total of 1 632 advisors had been trained in the country as a whole, of which 1 367 were advisors from VASC (between 25 and 124 in each VASC) and 265 from other advisory organisations such as private companies and NGOs.

The training of advisors includes field training and knowledge of regulations. The field training aims at recognising birds and plants in the agricultural landscape and this part was organised in 2007 in 10 geographical regions of high natural value in Poland.

The training in Polish and European regulations concerning the agri-environmental programme, filling of applications and preparing agri-environmental plans is a combination of an e-learning course and several stationary courses comprising a total of 90 teaching hours.

Computer programmes are used for preparing business plans, application forms for direct payments, agri-environmental plans and so on. The advisory centre agri-website has existed for a good few years ([www.cdr.gov.pl](http://www.cdr.gov.pl)) and there is also a new one ([www.agroportal.agro.pl](http://www.agroportal.agro.pl)). On these websites, advisors can find much of the necessary information and use the database.

A manual for cross-compliance has been produced in which the requirements concerning qualification and necessary knowledge for advisors offering consultancy services in the area of cross-compliance are listed.

## **9.4 Ongoing advisory programmes**

### **9.4.1 Programmes specifically related to environmental problems**

Measures 111 and 114 provide financial support for vocational training of farmers and people employed in agriculture and forestry, with the objective of restructuring and modernising agriculture, increasing the competitiveness and profitability of agricultural and forestry activities and achieving compliance with relevant national and EU standards. The total sum of this support will be limited to 80 per cent of eligible costs and cannot exceed 1 500 Euro for one farm. Access to advisory services on the cross-compliance regulations forms part of this measure.

The Rural Development Programme 2007-2013 is described further in Chapter 5.

Farmers who participate in the agri-environmental activities, Measure 214, must prepare an environmental plan for the specific farm in which the environmental situation on the farm and all the activities are described. This usually requires the assistance of an advisor. Farmers participating in the 'sustainable farming' sub-activity must produce an annual fertilisation plan

based on estimated nutrient requirements and on chemical soil analysis.

Other requirements of this activity are:

- Crop rotation (minimum 3 groups of plants: cereals, leguminous plants, root plants, oilseed plants, grass leys on arable land, others)
- Non-usage of sludge
- Permissible fertiliser rate (from mineral and natural fertilisers) 150 kg/hectare arable land, 120 kg/hectare permanent grassland.

The following non-government environmental organisations are actors in the agri-environmental programme:

- Ogólnopolskie Towarzystwo Ochrony Ptaków (Polish Association of Bird Life)
- Stowarzyszenie Chrońmy Mokradła (Wetland Conservation Centre)
- Mazowiecko-świętokrzyskie Towarzystwo Ornitologiczne (Ornitological Association of Mazowieckie)
- Klub Przyrodników.

#### 9.4.2 Examples of successful approach in advisory programmes

The World Bank project in Torun region (then voivodship) built 299 new manure storage facilities in one year in 2001. This quick result was very much due to the intensive information activities in the Baltic Agricultural Run-off Action Programme in 1997-2002, which involved the regional advisory centre, the local and regional authorities and not least the demonstration farmers and the neighbouring villages.

In one of the nitrate-vulnerable zones, the Ciechanów and Pułtusk areas of Mazowieckie, with a total area of 406 km<sup>2</sup>, a case study for implementing the action programme started in 2004. A training programme was designed for the 644 farms identified as potential sources of nitrate pollution from the total of 939 farms in the area. Short courses and training on the environmental requirements as well as information about possible financial support for investments were provided by the agricultural advisory service and by the end of 2005, 100 manure plates and slurry tanks had been built.

#### 9.4.3 Problems experienced in advisory programmes

Traditionally and still today, most of the advisors are production-orientated, with limited knowledge of environmental protection technologies and requirements. The level of openness and activity varies between the regional centres and it is mainly in the more 'modern' centres where information activities include prevention of farm pollution.

It is not common for advisors to independently interpret trial results into practical advice that can be implemented in the real agricultural situation by the advisor in the field. There is also still much to be done in the area of integrated pest management among both farmers and advisors.

## **9.5 Advisory services by the industry or producers**

The pig breeders association POLSUS has 650 members and employs a total of 100 people, of which 65 work directly with pig producers. POLSUS carries out advisory work on production techniques and product quality, breeding methods, production result indicators, regulations concerning hygiene and animal healthcare, farm economics and market information, and formal requirements concerning the formation of producer groups. According to POLSUS, there is a need for more advisory service provision about cross-compliance and environmental regulations in general.

## **9.6 Contacts between research and advisory service**

Research for the benefit of agriculture, agricultural markets and rural development is carried out by 20 research and development units reporting to the Minister of Agriculture and Rural Development. There is higher education with 47 departments reporting to the Minister of Science and Higher Education and 10 Institutes of the Polish Academy of Sciences reporting to other ministries. Some of the institutes involved in environmental agricultural projects are:

*Institute of Soil Science and Plant Cultivation (IUNG)*. Responsible for fertilisation and many other aspects of crop production and provides training for agricultural specialists.

*Institute for Land Reclamation and Grassland Management (IMUZ)*. Responsible for grassland production and environmental aspects of nutrient management, among other things.

*Institute of Plant Protection (IOR)*. Responsible for the testing and registration of agro-chemicals, development of integrated pest management methods, field trials and recommendations, early warning systems and training of advisors.

*Institute of Pomology and Floriculture (ISK)*. Responsible for plant protection in orchard production, spraying technology in general (both horticulture and agriculture), field trials, training in sprayer testing and training of the experts who teach the courses for agro-chemical certificates.

### **9.6.1 Contact channels and communication**

Generally, the R&D experts participate in seminars and training events organised by advisory units and vice versa and they are partners in different development projects. Experts from R&D institutes also participate in events, produce the recommendations regarding fertilisers, pesticides and crop varieties and other basic information for the advisory service to farmers, participate in the AAC publications, lecture in some of the AAC training courses and prepare answers for the help desk on the AAC website.

The AAC maintains different electronic registers available on the AAC website in which the information from and about R&D is disseminated, i.e.

- INFROL
- ‘Science for countryside and agriculture’
- ‘The offer’.

## **9.7 National legislation on water protection**

### **9.7.1 List of Polish laws with ordinances and regulations**

Act of 26 July on fertilisers and fertilisation

Act of 18 July 2001 on commercial goods

Act of 27 April 2001 regarding environmental protection with further amendments

Act of 12 July 1995 regarding protection of cultivated plants with further amendments

Act of 3 February 1995 on pest protection and agricultural land

Act of 13 September 1996 on maintaining cleanliness and order in municipalities

Decree of the Minister of Agriculture and Rural Development of 1 June 2001 on detailed methods of applying fertilisers and provision of training courses on the use of fertilisers

Decree of the Minister of Environment of 1 August 2002 on non-industrial sludge

Decree of the Minister of Environment of 16 December 2002 on conditions that need to be met by sewage discharged to water and soil, and the substances of particular threat for the aquatic environment

Decree of the Minister of Environment of 23 December 2002 on the criteria of designation of waters vulnerable to nitrate pollution of agricultural origin

Decree of the Minister of Environment of 23 December 2002 on detailed requirements for action programmes aimed at limiting the runoff of nitrogen from agricultural sources.

### **9.7.2 Supervision of agricultural producers**

The supervision of compliance with the regulations and environmental monitoring are carried out by the Chief Inspector of Environmental Protection. At voivodship level, the tasks of the Environmental Inspectorate are performed through the voivodship Inspector of the Environmental Protection. The State Plant Inspectorate, the regional office, enforces the agro-chemical regulations.

## **9.8 Relevant EU directives and programmes**

### **9.8.1 Nitrate Directive and Water Framework Directive**

The action programme for the nitrate-vulnerable zones, 1.7 per cent of land area, includes training of farmers in the safe handling of fertilisers, especially manure, and this is carried out by the Advisory Service Centres in Agriculture and the Chemical Laboratories. It is not uncommon to find the view that due to the low intensity of Polish agriculture, the problem with nitrate pollution does not occur and that GAP will prevent this even with future development of agriculture.

### **9.8.2 Integrated Pollution Prevention and Control (IPPC) Directive**

The permit is issued by the powiat authority and should be obtained by new farms before beginning operations and by existing farms according to the time schedule included in Regulation of 26.09.2003 of the Ministry of Environment. There are about 100 pig farms that require a permit and about half of these had obtained their permits by 2006. Most of the remainder were in the process of applying for the permit and a minority had not started the application procedure. Fertilisation plans, obligatory on IPPC farms, must be approved by the Regional Agricultural Stations but according to evaluation by NGOs these are not taken into consideration in the permit process. Public participation is not according to the requirements, which could be due to both lack of capacity of the authorities and of consultants who can facilitate professional applications.

### **9.8.3 Cross-compliance regulations**

The supervision of cross-compliance can be difficult, since the majority of Polish farmers have relatively small holdings, receive small sums of direct payments and maintain a minimum of financial records or accounts. The new regulations on traceability etc. require records to be maintained, which is a real problem on small and subsistence farms.

## **9.9 Conclusions and recommendations**

The problem with polluted shallow wells is decreasing, perhaps due to the decrease in animal production. The same is true for the total input of nitrogen and phosphorus to the Baltic Sea but the extent to which this is due to changes in agriculture cannot be determined since the method for source apportionment of pollution load is not very developed. There is no specific monitoring of agricultural runoff on watershed level as in the other countries studied. Some facts point in the other direction, towards increased pollution by agriculture, i.e. the increase in the total use of fertiliser per hectare in recent years. The national objectives as regards agriculture include environmental protection, preservation of the natural value of rural areas and biodiversity among several other objectives mainly stressing the need for modernisation and competitiveness. The problem with nutrient losses from agriculture is not specifically mentioned.

The reformed state advisory service, VASC, has gradually adapted to the needs of the new market-orientated agricultural production. On a national level and especially for small-scale farmers, the VASC is totally dominant in the field of production-orientated advisory service.

RDP 2007-2013 requires training a number of VASC advisors in bio-diversity and protection of birds and it also enables 'nature preservation organisations' to enter the advisory market. The scheme 'environmentally friendly farming' in Measure 214 includes crop and fertiliser planning which may require reconsideration of the crop requirements, especially for phosphorus. In RDP Measure 121 'Modernisation of agricultural holdings' there can be investment in manure storage, although this is not prioritised relative to other investment and it will require continued input of technical experts.

# 10. Conclusions and recommendations

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## 10.1 General remarks

It must be stressed that great caution should be exercised in making comparisons between countries that are so different as regards both geographical area and size of agricultural production. Poland also has a different agricultural history since most of the agriculture was private even in the socialist era, while agriculture in the other countries has undergone perhaps an even more drastic change in recent decades. The advisory situation is very different in Estonia, where the advisory service was completely privatised for some years but now there will be some national coordination again.

## 10.2 EU programmes and legislation

The EU policies and programmes are the strongest driving force for the advisory service in the four countries studied, naturally through the national policies and programmes for agriculture. The EU policies and programmes influence the advisory service through direct financial support and indirectly because the farmers need expert advice in order to utilise the investment funds and comply with the rules. Measure 214, 'Agri-environment' requires crop planning, fertiliser planning, soil testing and manure testing in all four countries studied. This requires experts in crop fertilisation and these experts must be updated to the latest knowledge level. With more focus on fertilisation plans it is likely that the nitrogen and phosphorus recommendations and the utilisation of manure in different situations need to be reviewed.

Measure 121 'Modernisation of agricultural holdings' includes investment in manure storage equipment and this requires experts in agricultural construction engineering and the standards for manure production and storage probably also need to be reviewed.

The cross-compliance regulations are emerging as an important driving force towards more environmentally friendly agriculture in all four countries and there will be need for many advisors, not just certain experts, to know the basic legal requirements regarding manure and pesticide handling and animal welfare.

In all four countries studied, biodiversity and especially the protection of birds has been given a high priority in RDP, but only in Poland has there been references to the training of advisors in this field. Organic farming is also included in all four countries and at least in Latvia and Lithuania there

are not enough qualified advisors in this field. In Latvia there is also a need for highly qualified livestock production experts.

### **10.3 Plans to reduce nutrient load to the Baltic Sea**

The problems with nutrient loads to the Baltic Sea are dealt with mainly through the EU ‘environmental’ directives and programmes but the very serious efforts to develop the relatively extensive agriculture in the countries studied may work in the opposite direction.

For Poland, it is a fact that the total input of nitrogen and phosphorus to the Baltic Sea is decreasing and this may overshadow the problem with nutrient losses from agriculture, which are neither very well known nor discussed. There is a developing understanding of agriculture as a source of local groundwater pollution and the need for improved manure storage but there is not much discussion about the diffuse leaching from fields.

In Estonia, Latvia and Lithuania there is monitoring of some typical agricultural watersheds and the knowledge about the connection between intensive use of agricultural land and intensive animal production is discussed. It has been shown that in some of the rivers flowing through intensive agricultural areas in Estonia, Latvia and Lithuania, the nitrogen load to the streams is increasing which can be explained by:

- The increased use of fertilisers (Estonia, Latvia and Lithuania)
- Ploughing of former pasture land (Lithuania)
- Taking into use formerly abandoned arable land (Estonia, Latvia).

There is no trend of increased phosphorus load in Estonia, Latvia or Lithuania as a result of more intensive use of agricultural land but the relationship between soils rich in phosphorus and high phosphorus levels in rivers has been established in at least one catchment in Estonia.

### **10.4 Views from other actors**

The producers’ organisations contacted reported interest mainly in acute problems such as cross-compliance and other legislation requirements that pose an immediate ‘threat’ to production, such as obtaining licences and complying with other requirements of the support contracts. The opinion of the Baltic Farmers’ Forum, which unites the farmers’ unions around the Baltic Sea, is that the measures in RDP and the Nitrate Directive together with voluntary market incentives are sufficient to achieve the reduction goals regarding nutrient load from agriculture to the Baltic Sea.

The environmental organisations Coalition Clean Baltic and the World Wildlife Foundation stress the importance of fertiliser management and more focus and stricter rules for intensive livestock production.



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This report presents the results of a study on agri-environmental extension services in Estonia, Latvia, Lithuania and Poland. Agri-environmental extension services can be defined as the organised exchange of information and the purposive transfer of skills to farmers with the aim to reduce undesirable negative environmental impacts. The study takes as a point of departure that agri-environmental extension services are carried out in all countries surrounding the Baltic Sea, and that there is currently a will and interest to enhance and expand such services. This is increasingly being promoted by several EU environmental directives, agricultural policy and support mechanisms and recently in the HELCOM Baltic Sea Action Plan. The study was conducted as a part of a recent Swedish initiative that tries to raise the Baltic Sea region focus upon such services.

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