IUCN European Programme

Influencing Agriculture Policy for Biodiversity Conservation

Based on Country Reports from Czech Republic, Lithuania and Poland

Editor

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IUCN Office for Central Europe in Warsaw
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Forward

Since the Rio de Janeiro summit of 1992 and adoption of the Biodiversity Convention, ecological non-governmental organisations and nature conservation specialists carefully have observed the development of agriculture policy in Europe and its influence on biodiversity and compliance with obligations under Convention on Biodiversity. Numerous non-governmental environmental organisations undertake activities intended to influence agriculture policy and draw recommendations, which follow the stipulations contained in the Convention on Biodiversity.

The 2000 European Programme began a process of policy analysis and development, which seeks to place IUCN and its members and partners in the forefront of international science-based comment on key issues in the field. The issues selected are based on members' priorities but also take into account up-coming policy opportunities such as the WTO talks, the IUCN World Conservation Congress, the Accession negotiations as well as cutting-edge issues that global IUCN Commissions and programmes have identified.

This report was drawn up by IUCN Office for Central Europe in an attempt to asses the influence of agriculture policy and regional development on biodiversity in three selected countries — candidates for the European Union: Poland, Czech Republic and Lithuania, and to propose directions for changes.

The publication results from the project, which aims at influencing policy–making proces in selected areas relating to the agriculture sector in order to better conserve biodiversity in agricultural landscapes in Europe. The policy areas concerned were:

- World and inter-European trade
- vertical integration — "from seed to shelf"
- integration of biodiversity in the rural development programmes in Central Europe

The publication is addressed to governmental institutions, international organisations, sponsors and non-governmental bodies interested in relations between sectoral policies and nature conservation. It can be used to establish priorities for actions aimed at further developing and implementing the methods, mechanisms and instruments of better introducing biological diversity considerations into the above mentioned policy areas.

The project has had international dimension involving policy makers and conservationists from Czech Republic, Lithuania and Poland. While sharing their ownership of the results with broad public. On behalf of IUCN we would like to thank them for presenting their views to the general public.

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Executive Summary

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Biodiversity and agricultural development in the accession states

The biodiversity of the Central and Eastern Europe accession states is still very high, due to the delayed mechanisation and intensification of farming. In Poland, for example, 31% of the total area of the country merits some official Nature Protection Designation, but despite this 20% of habitats in Poland that are considered to be of 'EU wide significance' are outside such protected zones.

Unfortunately, there are serious conflicts between national implementations of EU policies to promote both 'more equitable standards of (rural) living across Europe' and the protection of the environment and biodiversity, as much valuable 'biodiversity' occurs on marginal, 'peasant' style farms with very poor standards of living.

The EU wants accession states to protect their biodiversity before full membership, so that Agricultural Financial incentives cannot be misused to promote environmental degradation. This book reviews progress towards that goal.

Agricultural Markets in Central and Eastern Europe collapsed with the demise of Soviet systems in the 1990s, leading to changes towards private ownership and greatly altered market forces. These led to the abandonment of much marginal farmland and associated drainage systems, often with the consequential loss of rare habitats and species. The magnitude of the socio-economic problem differs between the countries here reviewed (Czech Republic, Lithuania and Poland). It is particularly severe in Poland, where 27% of total employment is in agriculture and the problems of agricultural development are thus inextricably linked with social and economic development; in 2001, seven per cent of the total Polish national budget was spent on 'social security payments' to farmers.

Policies for the **Future Directions of Agriculture** have been produced in great detail in all the countries reviewed; they recommend how to integrate agriculture with 'sustainable rural development' and the 'conservation of biodiversity'. The 30 pages of appendices to the Polish chapter, outlining the Polish legal measures, show clearly what a huge administrative task this has been, and highlights the considerable financial sums involved. In this review the interpretation of 'biodiversity'

is commendably wide, and includes the genetic resources of local varieties of crops and animals, which are also under threat.

Recommended national policies for biodiversity protection include increases in extensive and organic agriculture, but it is clear that market forces will also promote a contrary trend, through the intensification of agricultural production, in many areas.

Many threats to biodiversity remain, with agricultural abandonment possibly being as severe as the risks from increased intensive production. The threats are summarised in section 1.4, and potential ways in which policies could alleviate the detrimental consequences for biodiversity in 1.5. These suggested solutions take strong and sensible account of the pragmatic need for policies that enhance sustainable social and economic development along with protecting biodiversity.

The Future

Key conclusions are summarised in section 1.6. There is a clear overall consensus between countries that the EU and the accession states have made excellent progress, on paper, in producing the necessary legislative instruments needed to promote their vision of 'sustainable rural development combined with high nature values and biodiversity'.

Unfortunately, on present showing, this commendable preparation seems unlikely to be matched by similar progress in the actual countryside. Anyone familiar with the dreadfully low standards of living in much of rural Eastern Europe will appreciate that the priorities of local farmers and stakeholders are very heavily biased towards increasing living standards. Accordingly, the pressures to rapidly implement social and economic improvements, potentialy on local officials and politicians, are much stronger than those to implement nature conservation measures. These national reviews further conclude that:

- nearly all the key officials who are aware of their countries' environmental and conservation obligations are seriously over-worked,
- many local officials in non-environmental departments are critically unaware of their responsibilities for 'environmental cross-compliance'*,
- the levels of environmental awareness of local farmers and stakeholders are generally much lower than those of the local non-environmental officials.

In these circumstances, the chances of implementing environmentally benign policies before 'rural social' polices that lead to serious further environmental degradation, seem depressingly small. Sadly, unless efforts to educate local officials and stakeholders in the basic tenets of sound agri-environmental management can be rapidly escalated, much avoidable loss of natural heritage may imminently occur through simple ignorance.

There is a saying that "*the road to hell is paved with good intentions*". Unless the EU is prepared to see its good environmental credentials similarly trampled underfoot, in the understandable stampede for economic progress, it will, over the next few

* On report even refers to this of cooperation between ministeries as "almost scandalous".

years, have to put very, very much more effort into achieving the *implementation* of the laudable policies its foresight has created. Otherwise, progress 'in the environment', already disappointingly slow, is likely to lag so seriously behind 'socio-economic advances in agriculture' and 'abandonment of marginal farmland' that there is serious risk that much biodiversity that could and should be saved, will be lost due to disparity in just *the timing* of the implementation of different 'EU led' initiatives. Furthermore, it will be paid for, in part, by EU funds.

1. Influencing Agriculture Policy for Biodiversity Conservation

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1.1. Introduction

Since the Rio de Janeiro summit of 1992 and adoption of Biodiversity Convention, nature conservation specialists and ecological non-governmental organisations (NGOs) have carefully observed the development of agricultural policy in Europe and its influence on biodiversity, with regard to compliance with EU obligations under the Convention on Biodiversity. Numerous environmental NGOs have aimed to influence the agricultural policy and help to find ways to comply with the Convention on Biodiversity. This report, which was drawn up by IUCN Office for Central Europe, attempts to asses the influence of agricultural and regional development policies on biodiversity in three selected candidate countries for European Accession (Czech Republic, Lithuania and Poland) and to indicate the ways of facilitating beneficial changes.

Approach

Specialists in agriculture and nature conservation have analysed the relevant national documents and reviewed the activities of international organisations (World Bank, PHARE, FAO) to evaluate the effects of their influence on biodiversity. Furthermore, interviews were held with representatives from the ministries of Agriculture and of Environmental Protection and also from international institutions, asking about the importance of environmental protection, nature conservation and biodiversity issues in their documents and programmes. Based on the results of these reviews, the authors have drawn up three extensive national reports: these, together with this comparison and a summary, comprise this report.

The work leading to the national reports gave rise to numerous comments and suggestions, which allowed us to formulate recommendations on how to influence the development of policies for agriculture and rural areas so as to preserve, or even improve, the levels of biodiversity in the selected accession states. These recom-

mendations may be useful for environmental NGOs as well as for governments and institutions who care about the conservation of biodiversity.

1.2. Changes in the agriculture sector in the recent years

Changes to the political systems in all three example countries, at the end of the 1980s and early 1990s, had similar influences on agriculture. The changes in the agricultural sector from Central Planning systems to market economy mechanisms, without the implementation of some protective instruments, caused a decrease in the profitability of agricultural production and a breakdown of the agriculture products market. This led to a general decrease of agricultural activity. The average levels of fertiliser and pesticide use fell dramatically in all three countries, and now differs significantly between regions. Overall levels of use appear unrealistically low, due to extremely low levels of application in marginal areas for agriculture (mountainous regions and abandoned agricultural land).

Although in Poland we have not witnessed far reaching changes, such were observed in the two other countries. In Lithuania, in the post war period, there was extensive drainage of waterlogged areas to convert them into agricultural land: eventually 85% of arable agriculture was on drained land. This caused an irreversible loss of wetlands, together with their typical fauna and flora: today, the neglected drainage systems are replacing the former wetland species with other, less desirable ones.

On the other hand, in the Czech Republic in the post war period, the area of pastures and meadows was reduced slowly, as these were converted into arable land. However, after 1989, a rapid growth of the area of meadows and pastures was observed, especially in mountainous and hilly areas.

The structure of ownership of farms has also changed radically. As a result of privatisation, 10% of Czech farms are now family farms, but 90% belong to large companies. In Lithuania, by contrast, 63% of farms are 'household plots'* with an average area of 2.2 ha and 36% of farms are 'family farms', averaging 11.7 ha. One of the greatest problems of Lithuanian and Polish agriculture is abandoned farmland, which in Lithuania is estimated as 10–20% of the total area of agricultural land: formally private farms account for 90% of this abandoned land.

In Poland however, after the collapse of attempts to privatise state-owned and co-operative farms (which constituted only 15% of the total number of farms), the traditional nature of peasant farming is still preserved. Only half of Polish farms

* Under the communist system, in most countries, private citizens were not allowed to own anything (e.g. a farm, shop or company). Only in Poland were private farmers able to own land. Just after the war the acreage of such farms was limited to 50 ha in Central Poland, and 80 or 100 ha in the North-West (the former German part of Poland). After 1956, when the pressure for collectivisation in Poland was over, the situation improved, and many farmers inherited or bought more land. In many other communist countries citizens were only able to own 'household plots': these were rather small (like allotments), and only allowed the growing of vegetables, fruit and the keeping of rabbits and perhaps one pig etc., for personal use only. After 1989 this structure changed completely and the former huge state farms were rented or sold to the farmers or farming companies.

produce saleable produce for the market (the others are self-sufficient), and agriculture is not perceived as intensive; in the opinion of farmers it has no significant influence on the environment. The main problem of Polish agriculture is the fragmentation of farms (due to traditional inheritance practices) which results in both social problems and uneconomically small farm plots.

To emphasise the contrast between these three countries it is worth mentioning that Poland has approximately 2 million farms, Lithuania 76 thousand and the Czech Republic 36 thousand. Polish agriculture gives employment to about 27% of the working age population, which produces 5% of the gross domestic product (GDP); in Lithuania this is 20% of working population and 10% of GDP and in Czech Republic 5% and 3% respectively. Thus the problems of Polish agriculture are mainly social problems and the extent of these social problems is many times bigger than the problems of the much smaller countries, Lithuania and the Czech Republic.

1.3. Directions for agricultural policy and rural development

These three candidate countries have signed accessions agreements with the European Union which entail orienting new changes in their agricultural policies towards the Common Agriculture Policy (CAP) of the European Union and also the multi-functional development of rural areas. All three countries have published their strategy documents: Poland – Coherent Structural Policy for Agriculture and Rural Development (1999); Lithuania – National Strategy of Development of Agriculture and Rural Development (2000); and Czech Republic – The Concept of Agriculture Policy of the Czech Republic, for the EU pre-accession period (1999). The strategies for development of agriculture in all three countries have the purpose of preparing the national agricultural sectors for the introduction of structural instruments and a Common Agriculture Policy.

The Polish policy for rural and agricultural development is dominated by the need to solve social problems, mostly by implementation of phyto-sanitary and veterinary regulations and by modernising the processing of agriculture products and improving their quality and marketing. Such measures should improve the profitability of agriculture on the one hand, and the standard of rural life on the other, through providing employment in non-agricultural production and services. The second purpose is to improve the general living and working conditions in rural areas: improvement of infrastructure, including elements which protect the environment, such as the water supply system, sewage system, proper treatment of packaging and unused pesticides, and a search for alternative energy sources. Furthermore, help for young farmers is envisaged, in the form of preferential credits for the modernisation of farms. A few elements of the agriculture policy support activities for genetic diversity, such as maintaining rare breeds, the production of certified seeds, and organic agriculture. Agri-environmental programmes are taken into account only as planned development programmes in selected areas of the country. In future it is also planned to re-assign 20% of agriculture land for afforestation, which will increase the proportion of forests up to 30% of the total land area of Poland.

It should be mentioned that currently 73% (3.95 milliard EUR) of the Polish National budget (5.37 milliard EUR) expenditure for agriculture, which in 2001 constituted about 10% of total budget expenses, goes to social security payments for farmers. The composition of the remaining budget expenditure has no significant influence on the intensification of agriculture; but nor does it favour, to any significant extent, methods of farming which conserve biodiversity. The planned subsidies are as follows: 54.75 million EUR for biological development, 1.19 million EUR agriculture consulting, 1.47 million EUR for subsidising organic agriculture, 62.5 million EUR for subsidising interest on agriculture loans, 441 million EUR for financing the activity of Agriculture Market Agency.

In Lithuania the law 'State Regulations of Economic Regulations in Agriculture' contains a statement that agriculture plays a very important economic, social, environmental and cultural role, and that it is therefore a priority of the national economy. Also the Lithuanian SAPARD documents and Agriculture and Rural Development Plan for the years 2000–2006 present a laudable goal – *'to strive for the sustainable development of agriculture through the promotion of agricultural and other types of economic activity which are in harmony with the environment'*.

The first objective of the Lithuanian National Agriculture Development Plan is ensuring security of food supply, export development and improvement of competitiveness of agriculture products (including development of high quality and organic products), reduction of unemployment and promotion of environmentally friendly farming methods. It also assumes that the farmers will be *'paid'* for using methods which exceed the recommendations of the Good Agriculture Practice Code on sensitive areas (for example to decrease pollution by nitrogen fertilisers). It also assumes agri-environmental programmes in order to protect biodiversity and re-naturalise the landscape.

The State Support Programme for Agriculture in Lithuania aims to regulate the market, modernise farms and to introduce new technologies, diversify rural economies and improve rural infrastructure. In comparison, the planned Lithuanian subsidies to cereal production in 2001 amount to 18,000 thousand LTL, to animal breeding programme 10,000 thousand LTL and on organic agriculture and BSE monitoring 500 thousand LTL.

In the Czech Republic the Conception of the "Agriculture Policy of the Czech Republic prior to the entry into the European Union" is fully oriented for accepting *acquis communauitaire*. Because people employed in the agriculture constitute only 5% of population and produce 3% of GDP, no significant problems connected with harmonisation of agriculture are anticipated. Also large percentage shares of forests (37%), protective areas (30%) and protected areas around drinking water intakes, with certain restrictions in agriculture are conductive to this. Since 1995 Czech Republic supports the multifunctional model of agriculture and organic agriculture. Half of budget expenses for agriculture is intended for supporting the production and regulation of the market and the second half, for environment protection related payments and for solving social-economic problems. Special solutions for less favourable areas, agri-environmental programme and afforestation are anticipated in the Rural Development Horizontal Plan. However the agriculture policy does not refer to EU programmes and directives such as NATURA 2000, Bird Directive or Habitat Directive nor to a sustainable development model.

When establishing their agriculture policies for the next few years, governments of all the three countries covered by this paper, treated integration with the Common Agriculture Policy as a guideline. However a CAP is an instrument for promoting intensive conventional agriculture, and although Agenda 2000 introduces a mechanism for supporting environmentally friendly agricultural production systems, the extent of these mechanisms is seriously inadequate, according to the environmental NGOs. It will lead to a situation where 90% of EU funds is allocated to direct subsidy payments for agricultural production and only 10% goes towards promoting a multi-functional model of sustainable rural development, while expenditure on agri-environmental programmes will constitute a mere 4% of this. It is important to note that other experiences of the implementation such '*modified CAP*' programmes in certain existing EU member states (Austria, Sweden, Finland) indicates that, while they may have played an important role, in countries with long traditions of intensive agriculture, their benefits were rather marginal, compared to the scale of the changes resulting from the original intensification of production and thus the consequent degradation of the former natural environment.

From the point of view of environmental NGOs, a high input agricultural production system, supported by a CAP instruments poses much more threat to the environment than does traditional (extensive, low input) agriculture; such traditional agriculture only has a chance of survival in 'marginal' areas. EU accession poses serious direct economic threats to the viabilities of traditional agriculture in pre-accession states, which have much lower levels of agricultural intensification and, in contrast, very rich biological and landscape diversity. At present, in the very near future agricultural products from some countries and regions, produced in compliance with environment conservation principles, will have to compete in a single agricultural market with products from other countries and regions, produced without regard to these same principles. Neither farmers nor conservationists see this as 'fair and equitable'.

1.4. Potential threats to biodiversity from agricultural policy in accession states

There are several threats to the environment coming from agriculture, resulting both from direct agricultural activity and the indirect municipal administration of rural areas. These are caused, on the one hand, by intensification of agriculture, including mechanisation, use of pesticides, land consolidation and drainage. These activities lead to the removal of many habitats for numerous animal and plant species such as field head-lands, mid-field woods and ponds. Because most of the threatened species depend on extensive agricultural land, the factor which poses the greatest threat to many bird populations is the intensification of agriculture. The situation for flora is very similar: the strongest threats come from agriculture while tourism, resource 'mining' and industry are of less significance.

The first symptom of these changes for the worse is loss of herbs from grasslands of the segetal* flora. It is estimated that as much as 20% of species accompanying arable crop plantations is threatened because of the use of herbicides. For example

* S*egetal* – connected with cultivation; versus *ruderal* – connected with places abandoned by people.

Papaver rhoeas, Centaurea cyanus, Agrostemma githago, Adonis aestivalis and other weed communities associated with crops of flax, which are lost when flax is no longer grown. Intensive agriculture also constitutes a source of water pollution, due to fertiliser run-off, and to a lesser extent, from pesticides. Unregulated waste management also poses a threat to water quality, in particular from solid waste. The problems, caused by years of neglect of water and sewage management, are now being intensified by the widespread and popular adoption 'high consumption life-styles' in rural areas and by progressive urbanisation, especially around large cities.

Naturalists have a similarly negative opinion about the consequences of abandoning large areas of agricultural lands. This leads to natural afforestation of these areas (firstly as scrub) and the consequent loss of important habitats for birds and other animal typical of open landscape, especially in wet river valleys, and to permanent changes in the landscape structure. The report also assesses plans for the afforestation of marginal lands, which it concludes will cause irreversible changes to the flora and, in the long term, also loss of habitats for numerous animal species.

Although the traditional 'extensive' farming methods of Polish agriculture still maintain high biological and landscape diversity, current changes in agricultural methods, markets and social expectations are leading to a rapid and serious collapse of this traditional sector, which is vital for nature conservation.

In Lithuania the most significant threats to biodiversity includ such processes as: erosion of soils, pollution of surface and ground waters, use of fertilisers and pesticides and land drainage. Other activities (such as canalisation of rivers, cutting-down of farm woodlands, deforestation, drainage of peat bogs), changed the hydrological conditions and lead to the erosion of soils and changes in the landscape, disrupted the continuity of ecological corridors and resulted in losses of biodiversity. Because land drainage was formerly financed from the state budget, and those budget expenses are currently being reduced, it is likely that after Lithuania's accession to the EU, this system will be maintained but on a much smaller scale. Without doubt the farmers will only be able to ensure the effective functioning of parts of the drainage system. Before Lithuania gained its independence in 1990, the intensification of agriculture and the increased area of agricultural land took place at the expense of nature. Valuable biotopes and habitats were destroyed, and some species became critically rare. Intensive mowing and grazing caused a reduction in the numbers of birds and the diversity of meadow plants (the plants were not able to set seeds), while eutrophication of waters resulted in degraded water plants communities and reduced populations of aquatic animals (e.g. populations of crayfish). Today, the abandonment of farmland is causing a loss of open habitats by decreasing the area of meadows and pastures.

In the Czech Republic, the fragmentation of habitats and the loss of biodiversity (from wetlands, semi-natural meadows, solitary trees, small woodlands and ponds) are considered the biggest problems. Other threats include the eutrophication of waters and contamination by pesticide residues.

In all three countries, local domestic breeds of animals and local varieties of cultivated plants are being displaced by exotic varieties: the globalisation of agriculture is causing the disappearance of the local breeds. All three countries conduct

programmes for maintaining local breeds and varieties, with financial support, but the scale of these programmes is not large enough.

It is important to remember that changes to the rural infra-structure of Western Europe (such as the construction of water supply systems, sewages system and sewage treatment plants, manure silos and liquid manure tanks) and other activities which were intended to improve of the condition of environment, took place slowly, with the accompanying, gradual development of appropriate laws. The concern of the pre-accession countries is that economic changes in their rural areas during the transition period, forced on them by the 'EU adaptation' process, will proceed with rapid but varying speed and extent, and thus magnify the threats to the environment; for example lack of funds for ecological investment and insufficiently developed environmental awareness are likely to lead to problems that should be avoidable.

1.5. Possibilities of influencing agriculture policy to protect biodiversity

Assuming that the agricultural policies of pre-accession countries are oriented towards complete adaptation to their future participation in the 'common market', their governments have the possibility, indeed even an obligation, to use certain mechanism which lead to sustainable biodiversity management. These instruments should include: evaluation of the influence of policies on the environment; the requirement to implement good agriculture practices as a condition for obtaining direct and structural subventions in agriculture; agri-environmental programmes; Less Favoured Area payments; afforestation; and the European Nature Conservation System – NATURA 2000 designations.

Within the EU, evaluation of the effects on the environment of all policy documents of a strategic nature is a necessary element of the decision making process. This requires adaptation to the requirements of the "must and must not" legislation regarding exploitation of natural resources, permissible pollution levels, methods of waste management etc.

In Poland, subsidies for farmers via the social security system, allow the support of the traditional farming methods on small peasant farms. Furthermore, the agricultural budgets of Poland, Lithuania and the Czech Republic provide for subsidies for the preservation of rare breeds of animals, and varieties of plants. In certain regions of Poland rare varieties are still cultivated, and are available at local markets: however, the level of imported varieties of crops currently averages 31%; in the case of sugar beets it is 71%, grasses 35%, vegetables 60%. Traditional small orchards produce fruit only for their own families and for local markets. The very future existence of small farms, managed by traditional methods, depends on maintaining such local markets in Poland and in Lithuania. Although seed-banks supported from state budgets can maintain genetic resources, only the support of local markets and innovative ideas for the special marketing of regional products derived from rare breeds and varieties may, at the larger scale and in the longer term, effectively maintain biological diversity in agriculture.

The strategies for the protection of natural biodiversity prepared by the governments of all three example countries provide for certain plans of activities covering agriculture. However, in the opinion of the authors of the three national reports, too little has been done for their implementation. The prime causes are lack of sufficient funds, lack of ecological awareness and inadequate education. Therefore an agriculture policy conducive to the preservation of biodiversity should be based on the education of both farmers, decision-makers and businesses. A system of compensations, subsidies and continuing education (conducted over a long period of time) may encourage farmers and quickly change their attitude to the environmental protection issues raised by agriculture. But only knowledge and understanding of the natural processes may guarantee that decisions will be made based on understanding, at both the farm level and the political level. Otherwise, application of the systems of laws, prohibitions and incentives will not be fully accepted by societies and will thus not be effective.

An important element of ensuring the right place for biodiversity protection issues are consultations with farmers, representatives of the private sector, local administration and local self-governments* on the level of gminas, poviats and voivodships** and NGOs. The environmental NGOs, whose knowledge and experience are often appreciated by governments and parliaments, play an important role in the process, and thus they are consulted about legislation, programmes and strategies. NGOs also influence the media and shape the opinions of large groups of consumers, and by doing so they influence certain processes through the market. In many countries, for example in Germany, this happens in relation to food produced (e.g. the use of GMOs; animal rights). In Poland also the legislative system provides for the participation of social, ecological, producer and consumer organisations in the decision making process.

The official documents of many countries and the standpoints of numerous agricultural and ecological organisations stated the need for the sustainable development of rural areas, because one should not forget that agriculture, apart from its food production functions, also has social functions. These consist mostly of meeting the expectations of the society concerning the qualities of both food and of the environment. Although the realisation of the first of these functions may be remunerated by payment of a relevant price, the work of farmers for the benefit of the environment is not yet financially compensated by society. This will not happen until societies recognise that their landscapes and biodiversity provide them with crucial benefits, and thus contribute to pay for maintaining them. The traditional, picturesque, rural landscape and biodiversity may only exist thanks to the preservation of traditional, 'natural' farming methods: thus we should strive to improve the living standards in such areas, because they are significantly lower than those of nearby towns (in terms of infrastructure, availability of services, education, health care). If we do not do this, we will increase the gap between social groups, which will result in the marginalisation and increasing depopulation of rural areas and which will certainly have negative effects on rural landscape as well as serious social consequences (overpopulation, unemployment in the cities, social conflicts).

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* NEED a definition of 'self-governments'.

** gmina – commune (borough), powiat – district and province – country

1.6. Conclusions

Actions at different levels are required to protect biodiversity and promote its sustainable use. These actions must be carefully designed to take into account the current agricultural situations of the different pre-accession countries (such as Poland, Lithuania and the Czech Republic) and the different processes of change necessary for their adaptation to a Common Agriculture Policy:

In the national economy:

- implementation of the principles of conservation and of the sustainable use of natural resources into sector-oriented policies and ensuring its implementation using education and efficient legal and financial instruments.

In agriculture policy:

- implementation of the principles of the Convention on Biodiversity into agriculture policy and into plans for future activities,
- introduction of mechanisms ensuring effective management of biodiversity resources (e.g. environmental impact assessment of programmes for agriculture and regional development; Code of Good Agriculture Practice; agri-environmental programmes; European Nature Protection System NATURA 2000),
- maintaining local markets and organising the especial marketing of regional products, produce from rare breeds and varieties, and organic products,
- recognition of the wider contributions of agriculture to rural society, such as protection of the landscape and the quality of food produced.

In ecological policy:

- ecological education of the whole of society, in particular decision makers, farmers and businesses,
- the adaptation of consulting services to implement programmes for the protection of the environment and of biodiversity on farms,
- social consultations about activities connected with the protection of biodiversity, and in particular with environmental NGOs, local administration, self-governments, farmers and representatives of the private sector.

In agricultural and social policy:

- Use of public support, according to the social and ecological criteria and consumer requirements, to improve food quality,
- maintaining traditional farming methods, ensuring conditions for the continued existence of traditional 'peasant' farms, for example in Poland, through financial support via the agricultural social security system,
- improvements to the living conditions in rural areas through regional development programmes, in order to prevent depopulation of rural areas.

International co-operation:

- co-operation with international institutions such as JWP OECD (work on agri--environmental indices) and institutions of the European Union (implementation of Biodiversity Action Plan),
- promotion of the model of multifunctional European agriculture,

- participation in international discussion on ecological reform of Common Agriculture Policy and WTO,
- co-operation with non-governmental organisations such as IUCN, WWF and national organisations with extensive experience in protection of biodiversity.

2. Czech Republic

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2.1. The general agricultural situation

2.1.1. Introduction

Out of the total area of the Czech Republic (78,864 km^2) about 55% is used as farm land, some 33% (2,610 thousand hectares) is forest (or afforested) land; the remaining 12% comprises urban areas, lakes, reservoirs, wetlands, bare-rocks and bad-lands. Of the total area of farmland about 3,100 thousand hectares (73%) are arable and 950 thousand hectares (22%) are permanent grasslands (meadows and pastures); the rest of the farmland (5%) is vineards, orchards etc.

The main recent negative impacts on biodiversity resulted from changes to the area of permanent grasslands. Between 1948 and 1989 the area of meadows and pastures dropped from 1,075 thousand hectares to about 830 thousand hectares due to sizeable political and structural agricultural economic changes* (this period was characterised by collectivisation, intensification, and other phenomena). Since 1989 there have been successive increases in the areas of permanent grasslands, particularly in the foothills and mountainous regions. These were initiated by a sudden drop (still continuing) of both the extent and of the intensity of agricultural production, and were promoted by temporary economic support for sowing grass.

These new permanent grasslands were started, and continue to be established, particularly in places with farmlands that are difficult to harvest, or impossible to harvest at all, such as foothills and mountainous regions (featuring steep sloping tilled land, thin arable soil, risk of water and/or wind erosion), wetland or marshy areas and those areas unsuitable for mechanised production (use of the heavy machines; small or peripheral fields). However, these permanent grasslands also constitute an important element of the landscape, both adding to the cultural and aesthetical aspects of the countryside as well as containing plant and animal communities that are, in many cases, a particular feature and of ecological value to individual local areas.

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* mechanisation, crop choice, the introduction of intensive "modern methods"

Other traditional types of agricultural use, such as the hop-gardens (11,000 ha), vineyards (15,000 ha), orchards (49,000 ha) and gardens (160,000 ha) remain substantially unchanged during the last decade.

The structure of agricultural companies is relatively diverse and the proportions of different types of agricultural companies is quite similar; however, the size of the companies in the respective groups is very different, as summarised in Table 2.1 (data for 1999, made available by the Ministry of Agriculture of the Czech Republic).

Table 2.1

Types of companies	Number of companies	Area of agriculture land		Average size in ha
		in thousand ha	in %	
Individual owners*	33,968	822	23.5	25
Limited liability comp.	1,767	770	22.0	436
Joint stock comp.	631	725	20.7	1 149
Agricult. co-operatives	809	1,128	32.2	1 394
Others	406	35	1.0	86
In total	**36,641**	**3,505**	**100.0**	**96**

* Individual owners = family, private owners, including with partly rented land.

The numbers of private owners and limited liability companies are fairly stable, and the gradual increase in the number of joint-stock companies is the result of a continuing trend for agricultural co-operatives to transform themselves into joint-stock companies.

Table 2.2 lists farms/companies by size groups, and shows that family farms (i.e. those mostly with an area of up to 50 ha, or exceptionally up to 100 ha) comprise nearly half of the farm businesses but which, if we just consider the number but not the corresponding size, cultivate somewhat less than 10 per cent of agricultural land, while more than 90 per cent of the land is cultivated by the ”large“ companies.

In 1999 4.1% of the economically active population worked in the agricultural sector, which includes water and forest management.

According to the Ministry of Agriculture of the Czech Republic the main export commodities in 1999 were, as follows: milk and dairy products (16 per cent of the

Table 2.2

Agricultural land holding (ha)	Number of farms	% Farms	Agricultural area (ha)	% Area
up to 10	12,220	48.6	60,972	1.7
11-50	8,130	32.3	179,740	5.1
51-100	1,253	5.0	87,403	2.5
101-500	1,625	6.5	382,305	10.9
501-1000	748	3.0	556,722	15.9
1001-2000	770	3.1	1,090,864	31.1
above 2000	396	0.6	1,145,173	32.7

total exported volume of the Czech agriculture), oil-plants (15%), beverages, spirits, vinegar (11%), corn (9%), flour, malt, starch (5%), animal and vegetable oils (5%), live animals (4%), various kind of food additives (4%). The export of agricultural commodities represents a little less than 4% of the total exports of the Czech Republic.

The impacts of agriculture production on biodiversity

As in other European countries, agricultural activities in the Czech Republic have also significantly modified landscapes and their biodiversity. Natural landscape, without impacts from agricultural or forestry activities, can hardly to be found within the Czech Republic. The Czech landscape has been characterised by a high percentage of arable land for a long time (77.1% before World War II, 72.4% in 1997).

From a historical perspective, great differences can be found regarding land-use characteristics. In the past, a lot of small, stabilizing features existed in the landscape, such as field banks (grassland boundaries), solitary trees, dispersed plots of scrub and trees etc. But quite different cropping patterns and land uses characterize the landscape of the Czech Republic today, due to a ten-fold increase in average field sizes since 1945 (average field sizes have been: in 1945, 2.5 ha, in 1965, 10.0 ha, in 1997, 26.0 ha). Land consolidation in the 1950s led to an extensive loss of stabilising elements in the landscape. During that period 240,000 hectares of field banks, farm tracks and other features of the landscape were ploughed up. From that time about 500,000 km of small streams were canalised and 1,081,534 hectares of wetlands drained. Table 2.3 shows the major impacts of agriculture on biodiversity in the Czech Republic.

Table 2.3. An overview of main impacts of agriculture on biodiversity

Impacts	Cause	How it is relevant
Eutrophication and water pollution	Nutrients flushed from fertilised arable cropland and effluents discharged from point sources of pollution	Drastically reduced biodiversity of water ecosystems both in still and running waters
Contamination by pesticides	Same as above	Not investigated enough, probably low impact
Change of use	Drainage, ploughing of grassland or grassland improvements	Large extent, having major impacts on landscape and biological diversity (approx. 30% of land)
Mechanical damage	Especially during crop harvesting	Not investigated, probably low impact, current legislation is sufficient
Loss of habitats (biotopes, ecotones)	Changes in water regimes, loss of field roads and banks	Loss is significant, scattered trees have disappeared
Loss of soil biodiversity	Soil degradation (compaction by heavy machinery, pesticides, nutrients etc.)	Impact widespread and serious
Loss of crop plant biodiversity	Loss of less productive varieties	Well managed genetic diversity saves most of the relevant varieties
Loss farm animal biodiversity	Loss of regional breeds etc.	Well managed genetic diversity saves most of the relevant breeds

Source: Pražan (1997)
Notes to table: Diversification of the agricultural crops to be also considered, mainly for the landscape pattern but also including the local variety losses.

The following comments on the current situation in the Czech Republic illustrate threats to biodiversity from different agricultural activities and procedures:

- Large-scale habitat fragmentation and loss (of the respective habitats) have seriously affected biodiversity, in particular loss of wetlands, semi-natural meadows, solitary trees, small woodlands and ponds. In some regions, semi-natural habitats have been preserved or restored, due to subsidies for the continued use of traditional farming systems (such as the White Carpathian Flowering Orchid meadows), but the proportion of such areas is relatively small. Significant parts of valuable landscapes and habitats are managed as Less Favoured Areas (LFAs). A useful indicator of habitat changes in open landscapes in the Czech Republic is the drastic decline in the Partridge (*Perdix perdix*) numbers, from 6 million in 1935 to approx. 50,000 in 1997 (IUCN 1996, Mlčoch et al. 1998). According to the *State Environmental Policy,* the area under cultivation should decrease to 65% of the total agricultural lands by 2005. Selective and environmentally sensitive afforestation, establishment of bio-corridors in the framework of ***Territorial Systems for Ecological Stability*** (TSES) and expansion of permanent grasslands and pastures should be used to reach the objective (Ministry of the Environment of the Czech Republic, 1999).
- Another major impact is eutrophication and the contamination of agro-ecosystems by fertilisers. Use of fertilisers has significantly changed over the last 40 years, especially over the last 10 years (see Table 2.4) and the threat of eutrophication is now limited to the most productive regions. The use of inorganic (industrial, artificial) fertilisers and manure during the last 40 years was relatively high. Between 1989 and 1992, chemical fertiliser consumption declined by more than two thirds. The use of industrial fertilisers has now stabilised at about the 1992 level. Only the use of nitrogen has increased slightly, but it still remains far below 1989 level. The use of manure is also decreasing, due to the decline in the numbers of farm animals. As a result, the nitrogen application decreased significantly from over 100 kg per hectare of agricultural land in the mid 1980s to 53 kg per hectare of agricultural land in 1998.

Table 2.4. Annual application of fertilisers (in kg per hectare)

Year	N	P	K	Total
1989	103.2	67.1	59.7	230.0
1990	86.3	52.5	47.2	186.0
1991	50.0	8.0	7.0	65.0
1992	50.0	8.0	7.0	65.0
1993	40.0	13.0	10.5	63.5
1994	57.6	10.3	13.0	80.9
1995	55.6	16.6	12.7	82.9
1996	61.3	11.8	8.0	81.1
1997	55.1	11.7	10.1	76.9
1998	53.3	12.6	7.3	73.2

Source: Ministry of Agriculture of the Czech Republic (unpubl.)

- Another cause of biodiversity loss is pesticide use. During the transition period the use of pesticides decreased substantially, with some delayed effect on pollution levels. However, in recent years, a slight increase in the use of plant protection substances can be seen, although it still has not reached 50% of the pre-transition use (see Table 2.5). In 1996 nearly 4,000 tonnes of active substance of plant protection products were used in the Czech Republic, as compared to 9,928 tonnes in 1989. The risk of pollution and impacts on biodiversity is moderate nowadays, except for accidents (Ministry of Agriculture of the Czech Republic, 1999).

Table 2.5. Annual consumption of chemicals for plant protection (in kg of active substances per hectare)

Year	1985	1990	1991	1992	1993	1994	1995	1996	1997
kg	2.42	2.01	1.57	1.09	0.89	0.88	0.88	0.91	0.90

Environmental issues of Czech agriculture

These are still linked mainly with problems generated in the previous periods of collective farming, on the agricultural co-operatives and state-owned farms. In order to allow the effective use of highly productive machines, formerly small fields were amalgamated into huge areas, sometimes of many hundreds of hectares, and even on highly undulating terrain. The result of such an approach was the simplification and degradation of the landscape structure, the cultivation of monoculture crops and a vast increase in soil erosion. The reclamation of soil, and other actions aimed at the intensification of agriculture, destroyed many important biotopes (for instance by drainage of wetlands, canalisation of the little streams etc.), especially wetlands. As animal production occurred mostly in large-capacity intensive rearing units (for the accommodation of many thousand pigs or thousand of cattle), with their excrements processed in an industrial systems based on liquefied fertilizers (slurry). Such agricultural plants were erected mostly close to local communities and their buildings sometimes covered a comparable area to the adjacent village.

After 1990 some restructuring of these agricultural plants occurred, but the devastation caused by the collectivisation period could be remedied only partially. The newly established family farms were able to embrace only a portion of the private estates around the village residential areas. Lands pertaining to the large agricultural companies remained unchanged and the Ministry, too, did nothing to motivate dismemberment of the large areas in order to prevent erosion and strengthening environmental stability.

Following the radical drop in livestock numbers, the abandoned buildings fell into disrepair and thus the fixed assets of agriculture declined in value. The compensation shares, of the so-called 'Agricultural Restitution' after 1989, have still not been paid and, after several postponements, it is now believed they never will never be (due to further considerable degradation of the former collective farming arrangements – buildings, machines… – and the common finance and economic crisis in the agricultural sector).

2.1.2. Directions of agricultural policy

The discussion documents of the *Agricultural policy*, *Forest policy and Water policy* were elaborated by the Ministry of Agriculture of the Czech Republic prior the entry into the European Union (Prague 1999). We now give our critical analysis from the biodiversity point of view.

A) Concept paper* 'Agricultural policy for the EU pre-accession'

The size of the Czech agricultural sector needs to be given realistic limits depending on the internal consumption and the possibilities for export. In the process of specifying the required magnitude of domestic agricultural production (both for to domestic consumption and for export) a significant reduction in the area of land involved in the food production process is being considered. The considerations are for going from the current 4,284 thousand ha down to 3,123 thousand ha. The difference, i.e. 1,161 thousand ha, means that 27.1% of the agricultural land will be set aside and allocated to non-food production. A consequence of such a development will be a drop in the acreage of the arable land (including vineyards, hop gardens and orchards), down from the current 3,177 thousand ha to 2,701 thousand ha. A decrease in the arable land area of 476 thousand ha (15%) is being offered for non-food production (biomass, technical crops). Similarly the current area of meadows and pasture lands (permanent grassland) of 947 thousand hectares should be reduced to 422 thousand ha for various production purposes, and the remaining difference of 525 thousand ha (55.4%) will be eliminated from food production.

When viewed generally, such figures as presented above about the future situation may initially appear to be appropriate, from the point of view of biodiversity, because the proportion of ploughed land (degree of ploughing) will drop from the current 73% to down to 63% (relative to the current area of agricultural land). In reality, however, the following will happen: in the lowlands and at lower altitudes, where land of high production capability is concentrated, the overwhelming majority of current agricultural land will continue to be used for food production, which will, on the contrary, imperil the conditions for a sound biodiversity which these areas so desperately need. On the other hand, the allocation of land for non-food production, or even the "maintenance" of the land will occur in hilly and mountainous areas, where the current biodiversity situation is much more favourable. All this will result in a more significant polarization of the countryside (which is already obvious), which means that lowlands and low hill areas will be utilized even more intensively for food production, while in the highlands, foot-hills and mountain areas, agricultural production will be minimized. In the mountain areas, non-production or abandonment of agriculture causes more problems and complications, because, paradoxaly, the man-made ecosystems here enhance local biodiversity, and their important characteristics will be lost without management.

In our opinion, the reduction and limitation of food production should be spread out uniformly over the whole territory, as lowlands (including valley bottom lands and flood plains) need some grasslands (not to mention the need for anti-erosion

* Meaning a government policy paper that has been discussed with other interested parties.

protection or cattle grazing), areas of non-food production and forests, all in all for the purpose of strengthening the biodiversity. On the other hand the highest possible support and means are to be allocated for the implementation of pasturage and grazing, as the reasonable mode of utilizing the biomass and the most cost-effective kind of "maintenance" of permanent grasslands.

Currently agriculture is fully absorbed in resolving its own problems and is behaving very rigidly as regards the styles of cultivation and the methods used. The change in this behaviour happens only when agriculture is constrained to do this by economic means.

So far in this critique, although the term biodiversity has been used only once, it is implicitly included in more frequently used terms, such as environmental services, positive externalities, 'considerate methods to the environment', 'principles of a sound agricultural practice' and 'public services in landscape maintenance and rehabilitation'.

The discussion document shows a very strong division between the positions of the Ministry of Agriculture and that of the Ministry of the Environment (because the MoE have responsibility for the environment), including the opinions about the preservation of the natural beauty and wildlife. Agriculture however both utilizes and "maintains" country areas in a broad sense (for which it is being provided with subsidies from the state); the nature protection institutions take care of "nature conservation as stipulated by law". While, in a "open" country, the agricultural management is ready to qualify its activities as a "service to the society", it views the control mechanisms on agricultural activities in areas designated for especial 'nature protection' (areas with high natural value but which need some agricultural management) as 'detrimental to the production process' and in such cases the agriculture then requires specific financial compensation. This is evident from the totally different and inconsistent approaches of the governmental departments of agriculture on the one hand and that of the environmental protection on the other, which are both dealing with the one single and indivisible productive agricultural countryside and its environment.

Therefore, logically but unfortunately, the official future agricultural concept does not refer to, or even mention, other European Union directives and programmes (such as NATURA 2000, Birds Directive, Habitat Directive etc.). Although it is true that the competent authority for Nature Protection should take priority care of such problems, the financial resources available to it to solve these issues from the state budget, are totally inappropriate for the management of areas of nature reserves and the conservation of the wider biodiversity. Agriculture, on the other hand, is subsidized from the same state budget at a very much higher financial level: unfortunately the Ministry of Agriculture seems not to properly appreciate its potential key role for the benefit of biodiversity, nature, the countryside and its environment (at least not at the higher, most influential levels of its hierarchy).

Other protected areas exist, with prevalently agricultural utilization and the farming styles and modes of management of these has an indirect but significant impact on the biodiversity. This concerns especially:

- the areas protecting drinking water,
- protected areas of natural water accumulation,

- Ramsar habitats adjacent to agricultural lands or floodplains within agricultural areas,
- areas with tolerated inundations in flood plains,
- areas designated as "important landscape elements".

The unwillingness of both of the ministries to co-operate over rural landscape and environmental policies has currently reached critical (almost scandalous) levels; most unfortunately, all issues of environmental and nature protection may become the source of serious conflict in the future. However, the matter could be resolved by shared responsibility. On the one hand the nature protection department could provide its highly qualified staff to ensure an effective management of biodiversity and assess compliance by the agricultural methods chosen. The agricultural department, on the other hand, could "administer the financial support and budgets" to the farmers, who proclaim their readiness to fulfil their duties towards the achievement of environmental goals set out and to the strengthening of "environmental values of the agricultural countryside".

In order to achieve the "full value" from agricultural production the Ministry of Agriculture does not want to conceive of methods including "agri-environmental services" as full and thriving production processes as is the case with environmentally friendly agriculture. In the national concept paper, environmentally friendly agriculture is allotted only a very limited position, of about 20 to 50 thousand ha, but after the financial subsidies have been resumed the area of the organic farming to date (2000), is already in excess of 100 thousand ha.

The agriculture concept paper also does not mention the principles of "sustainable development" either in agriculture or in 'key landscape' areas. The term "sustainable development" is totally absent even in general terms, in the concept paper.

There are two phases within the concept paper of agrarian policy in the EU pre-accession period. The first period, called REVITALIZATION (2000–2001), is concentrated both on consolidation and stabilization of the sector of agriculture and on the preparation of agricultural institutions for EU-accession. The second period – ADAPTATION (from 2002 up to the year of EU-accession) – will be focused on adaptation of the whole of agrarian sector to the conditions of the EU Common Agricultural Policy (CAP) implemented in all policy fields: structural, regional, environmental, and country.

From the standpoint of positive effects on the environment, landscape and biodiversity promotion, there should also be in the first period continued support for the non-production functions of agriculture ("landscape maintenance" and supporting programmes of support for disadvantaged regions, in the sense of the 'Less Favoured Areas' – LFA – delimited within the EU). In this period, the preparation of environmental programmes which are valid within the CAP of the EU is taken into account. According to contemporary valid decisions (and formalised in the framework of the SAPARD programme – see below for details of SAPARD), this activity will concentrate exclusively on only three regions having the status of "protected landscape areas". Nevertheless, even this is a positive development, which was ensured by the high qualification of the specialists involved, and financially supported – at the international level – by the non-governmental organisation AVALON, based in the Netherlands.

Another case of applied support for "care and protection of agricultural land" includes also grants for the use of organic manure. This is, in a certain sense, a region-wide promotion of "housed" cattle breeding with its final products – manure and slurry – (fortunately this grant will not be continued either in 2001 nor in following years). Another important aspect, the protection of soil from water erosion, has been completely neglected until now. In this context, we note that, separately from grants for "landscape maintenance", agriculture also provides other grants, more or less for the whole country and the whole sector; one of them is the so-called "agricultural fuel"* based on agreed consumption norms. This support concerns both "extensive" and "intensive" types of agriculture.

During this first period, the ideas about agriculture 'helping' the environment, landscape and biodiversity sound more like "beautiful slogans" than real effects, and they are not based on any clear "biodiversity quality criteria". Their position relating to "production aspects of agriculture" (intensity and effectiveness of production, competitiveness of enterprises) is also rather unbalanced.

During the first period, environmental measures concentrated in the "pillar B" should be concretised. The "pillar B" includes grants for supporting non-production functions of agriculture (in 1999, 4,37 billion CZK, 125 million EUR); these comprise the maintenance of grasslands in the foothills and mountain areas (but not dairy farming, sheep farming, organic agriculture, forestry and liming). In following years, the sizes of grants are supposed to increase by 25%, so that such support will be spread also into the lowlands and/or other enterprises, to enlarge the participation in the programme.

We now present a new programme that will be introduced in the first period, namely the "Increase of the agricultural land quality" (with a budget of 1,75 billion CZK, i.e. 50 million EUR). This concentrates on:

- composting and manuring using farm manure,
- growing perennial forage plants on arable land (lucerne, trefoil),
- growing leguminous plants.

As mentioned elsewhere, this type of support was first implemented only for the year 2000, and will not continue beyond 2000.

In the first period, linking with the SAPARD programme is taken into account to support environmental investments by agricultural enterprises, such as the removal of point pollution sources (e.g. open dung holes, leaking liquid manure and sewage septic tanks etc.).

So far as biodiversity is concerned, in the first period, a positive effect be expected from the elaboration and verification of "Principles of good agricultural practice".

Unfortunately it can in general be stated about the measures for the first period that no measurable criteria of their effective impact have been determined, and that it is simply assumed that this necessary step will be carried out sometime in the future.

* For any technology process in agriculture "fuel normatives" are calculated (including machinery, transport, heating etc.). Farmers pay less tax for this so called "agricultural fuel".

For the second period, denoted as ADAPTATION (from 2002), there is determined, within "pillar B", the carrying out of environmental services in agriculture, in the wider environment and in rural development*; these should be in harmony with valid rules of the EU Common Agricultural Policy. In reality, continuation of some isolated programmes is concerned, which are closely connected and should be mutually linked. "Pillar A – Regulation of market and income support", includes, for example, the supporting programme for less favoured areas (LFAs within the EU) to motivate the farmers to use the 'nature friendly' practices aimed at providing environmental services. 50% of agricultural land is supposed to be included in this programme. The subsidies range between 100–3500 CZK (ca. 3–100 EUR) per hectar. Even this is only a schematic concept without clear criteria to ensure the grants' aims will be achieved.

The "pillar B – Environmental services", principally contains agri-environmental programmes with reference to, and in harmony with, the EU regulation No 2078/92 (the document was elaborated in the time of the regulation being in force, and before the regulation 1257/99 was approved). These programmes have the following objectives:

- large scale development of environmentally friendly farming, with a preference towards disadvantaged areas,
- contribution to the restoration and maintenance of wildlife, the protection of the quality and quantity of renewable water resources. Its main tasks are:
  - decreasing the concentration of nitrates in water and stopping the increase of water contamination (sense Directive EU 91/676/EHS),
  - rehabilitation of landscape structures, ecosystems and eco-stabilisation elements which promote biodiversity, conservation and renewal and which link in with the Act No 114/1992 on nature conservation but which also promote water accumulation, water retention within the landscape, maintenance and promotion of natural hydrological cycle,
- stopping the most serious forms of soil degradation and promoting its renewal: especially the prevention of erosion in the most endangered eco-systems,
- renewal and maintenance of landscape, namely as far as unexploited (derelict) land and durable grass growths without important farming exploitation are concerned,
- conservation of the genetic resources typical of Czech agriculture (e.g. regional animal breeds and varieties of crops),
- integration of agriculture into rural development by maintaining its settlement structure and conserving its cultural heritage.

Although the intentions have been formulated in such a manner, out-dated opinions of the relationship between agriculture and nature protection have unfortunately persisted despite these worthy overall aims, and still manifest themselves in details of the present document. To a certain extent, this is due to misunderstandings about, or unwillingness to respect, the new concept about 'land' (which only recently crystallized even within the EU, encapsulated by regulation 1257/99),

* Meaning settlements of less than 2000 inhabitants and in the "open landscape".

which is an indivisible entity, linked up by mutually connected activities, including the problems of nature protection and biodiversity enhancement. That is why the concept distinguishes and presents three types of claims for compensation for providing environmental services, in excess of the framework of duties determined by legal measures and by approved "Principles of good agricultural practice" (which comprise the non-compensated duties of farmers). The following payments are available:

- for service in the form of positive externalities following from agricultural production using methods which are environmentally friendly and which respect the landscape and biodiversity; this is done via a voluntary contract between the farmer and the state,
- for the maintenance of land without agricultural exploitation, as a service done for landscape maintenance,
- for lost income, as a compensation for legally constrained farming in areas preserved for nature and/or landscape values, and/or ecologically sensitive regions, where the introduction of agri-environmental programmes will be obligatory.

The unclarified "voluntariness" and "enforcement" of the provision of environmental services, the outstanding need for competent formulation of the conditions and criteria, control of the information about measured changes and other relations between the Agriculture and Environment departments are, at present, "weak spots" in these programmes. It is currently vital to work intensively on their clarification, while still in the first period – that of REVITALISATION. We consider that postponement of tackling these problems into the period of ADAPTATION to be unfavourable from the perspective of nature protection and biodiversity development.

It follows, from the above, that the structuring of the system of agri-environmental programmes (divided into five levels) is, at present, incompatible, and in some details even contradictory. The structure will have to undergo substantial changes before implementation.

The potential close links, or even direct connection, between the agri-environmental programmes of "pillar B" and the so-called "complex land division and consolidation" (Act 217/1997) is to be considered a very dangerous tendency. In our opinion, the high costs connected with these projects and their implementation are not justifiable in the present situation, when neither the initiation of a private-sector land market has been realised nor have the conditions concerning the selling of state land been clarified (the privatisation of ca 500,000 ha of state land is expected). We consider such direction of public finances into the "bottomless chasm of land division and consolidation" as inadmissible: the sum of 25–40 billion CZK – 0.7–1.1 billion of EUR is estimated as necessary to realise those aims. Such a sum cannot be justified under the goal of reaching the environmental objectives of agriculture. As far as policies for nature and landscape protection, including the biodiversity enhancement, are concerned, we consider such links as very dangerous for the future.

It should be mentioned that, in relation to subsidising environmental agricultural policy Czech Act No 232/1997 on agriculture, it is laid down that state support of

the programmes for fulfilling non-production functions of agriculture – protection of components of the environment, soil, water, atmosphere, and also of activities to landscape maintenance including the support for LFAs.

The conditions for this support for the years 1998–2000 were determined by two Government decrees with a limited period of validity (up to the end of 2000). For clarity's sake, it should be mentioned that the development of such types of subsidies has taken place in a positive way from 1994. The grants were concentrated on mowing and the extensive exploitation of 'permanent' grasslands in foothill and mountain areas, on establishing new grasslands on arable land, partial afforesting of agricultural land situated in extreme environments, i.e. to activities contributing, directly or indirectly, to the support and development of biodiversity in the rural landscape.

The grants for organic agriculture can be considered as the most positive subvention type which has been renewed, after a break of some years, in 1998, and which has continued in 1999 and 2000. Due to their stimulus, the area of agricultural land with organic farming increased several times (from 20,000 ha in 1997 to 72,000 ha in 1998, 110,000 ha in 1999, and finally to 157,000 ha in 2000).

The design grant programmes to support the non-production function of agriculture for 2001 and the following years was negotiated by the Government and confirmed by Czech Government Decree No 505/2000. These supporting programmes have still been conceived in full agreement with the EU Decree 1257/1999, so that the requirement to harmonize this part of the Czech agricultural policy with that EU decree could be fulfilled. Due to this step, positive support to implement the function of agriculture in the environment, and to support biodiversity, took place more rapidly than was expected by the above mentioned 'concept of agrarian policy' for the EU pre-accession time period of the Czech Republic. Within the defined agricultural functions which are supported by these grants, it is explicitly expressed that they fulfil "protective functions, i.e. protection of fundamental components of the environment, and protection of biological and landscape diversity".

B) Concept paper of 'Forestry Policy for the EU pre-accession period'

Forestry, with its close links to ecological aspects of rural landscape and to biodiversity, is considered a part of the sector of agriculture. In comparison with our above critical standpoint to the "agrarian concepts" the "forestry concept" has, both in its fundamental standpoints and designed realization, measures aiming at sustainable forestry and more favourable environmental effects in most cases. According to this concept, its functions are the following:

- ecological (protection of global and local environment – world-wide cycles of carbon and water, control of soil erosion, protection of water sources, protection of landscapes against natural disasters etc.),
- economic functions (renewable natural resource of wide-ranging exploitability, such as raw wood and other forestry products; a resource of employment and incomes in rural areas),
- social and cultural functions (conservation of landscape and of cultural heritage, recreational functions etc.).

The fundamental legislative framework shaping the management of forests is the Act No 289/1995, on forests. In the main principles of state forestry policy there are quoted the following, ecologically motivated priorities:

- improvement of the state of forest ecosystems,
- conservation and increasing of the biodiversity in forests,
- development of non-production functions of forests,
- spreading the exploitation of wood as a natural renewable raw material.

This a positive (and principally necessary) answer to long-term negative impacts on forest ecosystems (emissions from polluted atmospheres, "industrial" methods of growing and extracting timber, monoculture and unnatural composition of woody species) the consequence of which was the serious weakening of the ecological value and stability of forest ecosystems.

However, the good intentions of this concept paper stretches our optimism a little, when taking the current situation into consideration. For example, the contradictory opinions on the necessary measures to suppress the "catastrophic bark beetle epidemic" in the most stringently protected zones of the National Park of Šumava*.

The State policy of forest management, included in the concept paper, is also directly aimed at strengthening biodiversity. The possibilities for its implementation are, among others, supported by the fact that about 55% of forests in the Czech Republic are owned by the State, and their privatisation for the benefit of the private sector is out of the question. Among the positive measures planned by the Ministry of Agriculture, the following should be mentioned:

- implementation of requirements aimed at decreasing the toxic gas emission burden on forests into the concepts of state policies for industry and transport,
- renewal of the equilibrium between forests and wildlife,
- dissemination of appropriate environmentally friendly technologies in forestry,
- gradual afforestation of a portion of agricultural land.

Unfortunately, there will be no firm information on these last-mentioned facts (e.g. the area farm land to be afforested, time-schedule of realization, further inter-relations of this process), either from this forestry concept nor from the agrarian one.

The explicitly formulated objectives, aiming at biodiversity conservation and promotion, include:

- promotion of species composition of plants and animals in forests,
- increase of growth structure and growth resistance,
- care of gene resources of forest woody species,
- ensuring sustainable and balanced wood production.

So far as the development of the non-production functions of forests are concerned, the following objectives are formulated within the framework of the forestry concept:

* The biologists opinion was to leave the dead trees, the foresters decided to cut them down.

- promotion of the unsubstituable functions of forests in areas important for nature and landscape protection, of major ecosystems and/or species threatened with extinction, and to their natural environments,
- increase of the health-recreation potential of forests in frequently visited localities (suburban and recreation areas, and the environment of spas),
- strengthening of the positive impacts of forests in areas important from the point of view of water resource management.

Another mediating influence of forestry for biodiversity promotion can be seen in larger exploitation of wood biomass as a renewable resource aimed at:

- promotion of wood consumption as of a renewable, environmentally friendly and wide-ranging exploitable raw material,
- creating the preconditions to increase the exploitation of wood from broadleaves.

The entire volume of sustainable annual increment in the Czech Republic has represented, for a long-time period, 13–14 million m^3. The increase in wood consumption is solvable only under the presumption of linking the forestry policy with the State concept in other sectors (environment, energy industry, industry, construction industry).

It is to be expected that step-by-step a reliable certification system functioning on voluntary basis will be adopted in the timber market. By this certification system the sales of timber originating from forests which are managed in the sustainable way will be promoted. At present, the volume of this market represents in Europe only 1% of marketed wood. The international wood trade is based on a system of export licences.

The proportion of forests owned by the State, namely the areas managed by the State Enterprise Lesy CR (Czech Republic Forests) is 1,435 thousand hectares, i.e. 54.4% of the entire forest area, and it contains 19,730 km of small streams. This has enabled the formulation of further biodiversity objectives, namely:

- ensuring optimum exploitation of state owned forests, so that they guarantee all the forest functions,
- decreasing the need to draw on State budgets, by financing some works which are of benefit to the public from the internal resources of the State forest organisations.

Further on, they have, at their disposal, effective tools and means for fulfilling other objectives connected with long-term sustainable management in forests:

- strengthening the significance of regional forest development plans,
- development of economic planning oriented to the needs of forest owners,
- improvement of information on the condition of forests.

To fully implement the management concept in forests, the programme takes account of interdepartmental (intersectoral) and international co-operation aimed at:

- improvement of communication, co-ordination and co-operation with sectors linked with forestry,

- ensuring the harmonization of legal prescriptions for forestry with those of the EU,
- active membership in international governmental and non-governmental organisations and programmes, namely when fully carrying out the resolution of the Pan-European process and forming and implementing the state forestry policy.

For interdepartmental (intersectoral) co-operation, and also that with the agrarian section of its own ministry (see the problem of afforestation on a part of current agricultural land) the concrete subject matter has to be elaborated. At the international level, the incorporation of EU directives and regulations relating to the problems of forest management, in all aspects, into the Czech legal standards will be negotiated. The economic problem related to compensation for non-production forest functions is inseparably linked with the problems of production and non-production forest functions.

The State budget necessary to ensure the existing non-production forest functions was calculated, for 1999, at 1.3 billion CZK (37 million EUR). If the State declares its interest to develop the non-production forest functions, so it is obliged to take this fact into account by an increase of the corresponding sum when planning the State Budget.

The State forestry policy is consequently based on the principle of sustainable management of woods, stressing the development of ecological forest functions. Wood production, in spite of the knowledge of its exceptional ecological value, will decrease, subject to implementation of extra-market principles. Non-production (environmental) forest functions are the public asset for which the owner will be compensated from public budgets. Other resources for covering the needs of forestry cannot by used for the present, because no legalized fund yet exists in which the monies could be held.

C) Concept paper 'Policy relating to Water Resources management for the EU pre-accession period'

In the Czech Republic the competency relating to water resources management is held by the Ministry of Agriculture, but shared with the Ministry of Environment. This section deals with biodiversity protection and development in water ecosystems, and therefore it is also a case for our evaluation and comment.

Similarly to the agrarian and forestry policies, the policy relating to water resources management has also been included in an independent concept paper for the EU pre-accession period of the CR. This concept paper adopts the ecosystem concept of water within the system of the environment, and focuses on the functions that water, and water resources management, must provide, by stressing water protection in the natural environment. The traditional measures of water resources management and activities are regulated in the interest of nature and landscape structure protection, of natural renewal of water resources and/or biodiversity of water ecosystems. The water resources management sets the following main principles of functioning:

- implementation of integrated approaches to protect and exploit water resources within sustainable limits (a long-term endeavour to conserve the water resources as a precondition for life in the future),
- ecological goals (interests in protection of water systems, nature and landscape structure) and water resources management interests (interests in exploitation of water resources including the protection of real-estate and water configurations against detrimental impacts of water) are to be evaluated in complexity, both interests being well balanced,
- services related to water resources management connected with water resources management and with care of water configurations and implementation of water resources management elements within the framework of regional technical servicing are to be carried out within the framework of sustainable water supply and distribution planning within a hydrological catchment area, taking into consideration the interests of water ecosystems, nature and landscape structure protection.

The concept also refers to the EU Water Framework Directive, and as the main priority, it pursues three fundamental environmental interests of environment protection which, according to the Directive, the sustainable exploitation of water resources has been determined:

a) attaining good states for surface waters, namely from the chemical aspect, and good ecological potential, namely by preventive measures and by cleaning up of polluted surface water,

b) attaining good states for ground water, namely by prevention of worsening the state of ground water, cleaning up the polluted ground water and ensuring a good balance between water consumption and topping-up the ground water resources,

c) attaining harmony with all standards and objectives relating to 'preserved areas', proclaimed according to the legal prescriptions of EU, and according to the principles included in the Directive mentioned.

As far as other specifications are concerned, e.g. the types of water ecosystems (wetlands, natural streams, ox-bow lakes etc.) the concept paper refers to further elaboration in the so-called 'water supply and distribution plans of hydrological catchment areas' in the future.

Two facts relating to how the water resources management will function, need to be added, which reduce a little the optimism expressed in the Czech Republic concept for water regarding improvements to biodiversity and nature and landscape protection:

- The first is that water resources management has been, for many decades, a prisoner of technocratic approaches, and that the number of specialists in biology working with the teams from the water resources management institutions is very scanty. A radical change to a genuine 'ecosystem concept approach' of actual water resources management can only be achieved by developing a new generation of specialists, including a large increase in biological and ecological aspects.

- The second fact is, that the competences in water resources management have been, for several years, divided between the Ministry of Agriculture and the Ministry of Environment of the Czech Republic: the differing responsibilities are unclear and their division thus rather difficult under present arrangements*, the department of agriculture should take care of water exploitation, and the department of environment, guarantee water as natural resource, and carry out the function of control). This lasting 'schizophrenia' regarding responsibilities for water supply and distribution does not bode well for the actual adoption of the sorely needed and much proclaimed 'ecosystem' concept of water management.

2.1.3. Proposed budgetary Law for Agriculture for the year 2001

The data obtained from the Ministry of the Agriculture of the Czech Republic estimate support for the agricultural sector of about 7,000 million of CZK (about 200 million EUR) for 2001. In principle, there are several separate budgets – one for the support of production system of agriculture ('agricultural fuel', milk subsidies) divided into a non-investment part (2,045 million CZK), investment part (425 million CZK) and the 'guarantee and support fund' (about 1,500 million CZK). Another part of the budget dealing with the non-production functions of agriculture according the 'Governmental Regulation No 505/2000' (meadows, pasture, afforestation) have an approved amount the support of 2,800 million CZK.

2.1.4. Governmental Regulation No 505 of November 22nd 2000 – dealing with the support of non-productive functions of agriculture, the maintenance of landscape and the support of areas less appropriate for farming

The continuing process of negotiations about the admission of the Czech Republic into the EU has motivated the Ministry of Agriculture to some substantial changes in its subsidy policy, starting from 2001, aimed at establishing conformity with the EU practices. The above mentioned Governmental Regulation is one of the key tools for the implementation of the new subsidy policy, which are founded on the following principles:

- the implementation of a system of subsidies,
- definition of subsidies and grants to be valid during the 5 subsequent years and make these compatible with the No EU regulation 1257/99 dealing with the support of rural areas,
- the evaluation of the subsidies, which is to be done in a more clear and understandable way, by using financial rates,
- the simplification of the administrative steps used in granting the subsidy.

Included in the Czech Governmental Regulation are only those subsidies that really have to do with the non-production functions of the agriculture and the improvement of the environment in the countryside. The Regulation aims at to:

* The division of the competencies is sometimes unclear, while others are irrational or absurd.

- bring back cattle into the countryside, by using pastures,
- maintain the cultural features of landscape in foothill and mountain regions, and to support farmers operating in those regions,
- turn to grassland, or afforest, the soil at sites made useless by collective arable farming in the past,
- improve soil quality.

A short outline of the particular programmes is given below:

1. **Supporting of agriculturally less appropriate areas**

   The program defines the "less appropriate" types of area, such as: hilly areas, sloping areas, areas to be hydrologically protected because of water resources, separate zones in protected landscape areas and national parks. The support exclusively concerns the permanent grasslands/pastures. The aim is to oblige the farmers to reduce the extent of arable land and to grass these areas. The money can only be awarded if the farmer in question keeps the number of cattle below a set upper limit and is conditional on the complying with quite simple principles of sound agricultural practice. The subsidy may vary between 500 and 2900 CZK per hectare of permanent grassland.

2. **Grass farming, afforestation, cultivation of pioneer species**

   This comprises a group of programmes which aim to reduce the excessive amounts of arable land and to provide diversity in a landscape. In principle it is a continuation of the existing support, with an additional priority, and stipulated criteria, for areas to be sown with grass. In this sense one or more of the following criteria have to be complied with:
   - areas with a slope of more than 7°,
   - areas with a soil profile thickness up to 30 cm,
   - areas adjacent to rivers and water storage reservoirs,
   - areas located in less appropriate regions.

   The process of the conversion arable land to grassland farming has been valued with fixed subsidies of either 6,000 or 10,000 CZK/ha. Afforestation is also a process that continues for a long time, for which some criteria are currently being modified. Subsidy is awarded to allow the purchase of seedling plants, for amounts up to 100,000 CZK per hectare of newly forested area. During subsequent years funding may also be obtained to defray costs of silvicultural operations. Financial aid to establish new woods is constrained to areas of at least 0.25 or 1.0 ha, and may be used for the reimbursement of the seedling plants.

3. **Subsidy for the maintenance of grassland by means of cattle grazing**

   This is a newly implemented program to encourage grazing on permanent grass-land, with a specified maximum stocking rate per ha and other limiting conditions stipulated.

4. **Support for organic farming**

   This program continues a previous one and has been currently complemented with valuation criteria related to different types of organic farming and giving

fixed financial support to them. This program has also been matched to the operating conditions of the Act No 242/2000 on the organic agriculture that became law on January 1st 2001.

5. **Support to bee-keeping**

   This support also continues from the past. Bee-keeping has been awarded a full and highly positive non-production benefit within the landscape, and this is supported with financial support of 150 CZK/colony of bees that survives the winter period.

6. **Liming support**

   This program started two years ago, and starting from the current year, will include all those areas with acidity lower than 5.5 pH. The subsidy should cover the costs expended.

7. **Support for the installation of elements of territorial systems of ecological stability (TSES)**

   This is considered to be a starting point in the program of strengthening of structural environmental elements in the agricultural landscape (bio-centres, bio-corridors, interactive elements), which have been being developed for a long time, and whose concepts and design were drawn up by the nature protection authorities and the Ministry of Agriculture and the Regional Planning Authority. One hectare established to conform with the above regulations is subsidized by up to 100,000 CZK and additionally backed with funds for after-seedling care for the next three years. Guarantees for the fulfilment of the stipulations of this document are kept also by the Ministry of Environment of the Czech Republic.

2.1.5. Strategy and priorities within the framework of the SAPARD plan

Strategy of the development of agriculture and the countryside

The definition of the strategy solving the primarily issues of the sustainable development of rural districts of the Czech Republic uses the possibilities of an integrated approach made available by using the SAPARD program. This kind of integrated approach means that issues are resolved in a concerted way, aimed at the achievement of desirable social, economic, environmental and cultural effects during the development of rural areas. This will provide for the mobilization of both EU and national, regional and local resources to the particular issues of the rural population, over adequate time periods.

This integrated approach will make it possible to eliminate the drawbacks of agriculture as a dominant system in the majority of rural areas.

- Investments in agricultural companies should be supportive of the implementation of *acquis communautaire* and provide for the elimination of one of the

drawbacks, i.e. inappropriate standard of living and the hygiene for crops and farm animals.

- Bringing the food production industry up to the current EU level is also aimed at increasing of competitiveness of food products and the suppression of another drawback, which is the inappropriate level of conformity to the safety-related standards to be applied in the processing industry. The modernization process will also strengthen the marketing possibilities of the food processors.
- Support for marketing is aimed to improve the market position of both the original producers and the processing plants, better use of the sales potential and an increased profitability of the food industry.
- The increased competitiveness of the original producers will also help preserve employment levels, especially in rural areas.
- Investment subsidies shall also support the final settlement of legal rights and the establishment of a fully operative local market.
- Support to develop and implement strategies for local regions, which should include the participation of settlers and new businesses and industries. This includes investment support for the infrastructure and aims to help eliminate differences in the quality of life between the urban and rural districts, and provide for improved development conditions for small and medium size companies operating in the rural areas.
- Support for large scale diversification of activities in country areas shall assist the elimination of other weaknesses, such as reducing rural unemployment and preventing the exodus of rural people to urban areas.
- The support of 'environmentally friendly' agriculture in protected areas by using pilot projects should extend our experience in the preservation and the improvement of nature values in the landscape and the environment.

The above process assumes the use of the following important aspects:

- qualified workforce in the agriculture,
- favourable natural conditions,
- tradition in the production of some specific local food products,
- increased interest from farmers and the public in living standard and environmental issues,
- the existence of large-scale protected landscape areas,
- natural beauties and the cultural heritage as a basis for the country-bound tourism,
- favourable conditions for the use of biomass as an energy source,
- experiences gathered in the course of the Country Renewal Plan.

SAPARD priorities

Based on the development strategy for rural areas and after the assessment of possibilities offered at the national level, and thanks to the other pre-input tools linked especially with the use of opportunities provided by the SAPARD plan, there exist three priorities, as follows:

A) The increase of the competitiveness of agriculture and the food processing industry

B) Sustainable development of rural areas

C) Prerequisites for a comprehensive use of the plan

The above priorities are fully compatible with the principles of rural development within the European Union and they are arranged into three different groups of measures:

I. Measures to be implemented in order to increase the competitiveness of agriculture and that of the food processing industry:

I.1 Investments into agricultural real estates

This relates especially to reconstruction, or the erection of new, buildings for cattle breeding, and the storage capacities for fertilizers (during the year 2000 a study has been conducted in which the necessity of investments for this kind of building is shown on the so called "vulnerable areas", i.e. on about a third of the agricultural land – estimated costs of about 20 billion CZK). Other buildings refer to the storage of vegetables and fruits.

Our reservations to these provisions are as follows:

- due to the fact that the Czech Republic requires a transitory period for pig breeding and egg-production (until 2006), the currently unfavourable state, and the environmental issues, will be extended. Contrary to the general logic, it is proposed to use SAPARD support to build "storage capacity for animal production by-products", which largely means continuing use of large--capacity buildings. Instead, the money should be used to redistribute the animal production capacities within the area concerned and to transform the liquefied manure (slurry) plants into solid manure (with the use of straw). As regards the building of storage capacity for vegetables and fruit, the negative impact on the environment is then obviously restricted to a minimum, but such buildings should be required to be sympathetic to the appearance of the landscape.

I.2. Improved processing and marketing of agricultural and fishery products

Implementation of these measures should not necessarily be detrimental to the environment, and could even be advantageous if highly effective technologies to prevent leakage, for cleaning waste and by-products were used. When supporting the regional products of small-size and medium-size companies (since in this sense only, is it plausible to speak about regional or local products) the risks of negative impacts on the environment may be reduced or completely eliminated in the case of environmental friendly agriculture (based on the certification principle).

I.3. Improvements in the quality control, food quality inspection and the protection of consumers

Food hygiene measures, in principle, play an indifferent role in terms of environmental impact, so far as they relate directly to man. In such cases they are directly linked with his protection. For large scale food production facilities where poor hygiene can have catastrophic effects, strict norms and rules and a free press are important safeguards of public health.

However, applying the same rules to small local producers could force them out of business (as has happened elsewhere in Europe where rules were over-zealously applied): for example, the monthly inspection costs that a large producer can afford would wipe out the profits of an agro-tourist farm serving home-produced food in small quantities to its guests. It is to be hoped that the new regulations will be designed to cope with a range of production systems, such that the types of inspections, and their costs, can be made commensurate with the volume produced and thus the total risks. Otherwise, rural diversification will be sorely impaired.

I.4. Soil rehabilitation and allotment of the soil

This measure is aimed at a partial renewal of irrigation systems, the usage of which stopped after 1990. In particular, however, it relates to the implementation of the so called "comprehensive allotment of the soil", linked with enormous investment costs (the first estimate amounts to about 25 billion CZK). Owing to the fact that there is no significant market for private agricultural land, this seems to be an end in itself (we deal with this issue more in detail in section 2.1.2 of this report).

This group of measures is aimed at having more agricultural and food processing companies and plants, whose production conforms to EU standards, aiming to achieve a stronger position for the original producers in the market and an increased share of value-added products on the market. These measures will support the active approach of the farmers to the increase of competitiveness, while offering better prerequisites for the marketing of products from their own food processing plant's and by extending the sales opportunities, after the implementation of hygiene standards at the EU level. In a broader sense this will provide for the stabilization of the employment level in the countryside, for the stability of income and for the generation of conditions necessary for the sustenance of a whole environment.

II. Measures to be implemented in order to maintain the sustainable development of rural areas:

II.1. Renewal and development of villages and rural infrastructure

The respective infra-structures (water supply, gas, transport communications, electricity) have already been developed on a priority basis during the last decade (gasification, telecommunications, road networks, water supply networks, sewage systems). It is feared that some of the SAPARD financial support might be used for further development to such networks. We suppose these funds should also be used to support the development of alternative and renewable energy sources (wood, biomass, solar and wind energy).

II.2. Development and diversification of economic activities aimed at various activities and alternative revenue resources

These steps should urgently be developed in the Czech Republic, mainly due to the fact that the collectivisation of agriculture completely removed the preconditions and prerogatives for their renewal. This also is the reason why only a minor shift could be achieved during the last decade. These historical events have also caused rural people to mistrust any radical changes or 'entrepreneurship' in agriculture.

II.3. Agricultural production methods aimed at protection of the environment and the preservation of the landscape

This relates to the application of agri-environmental programs implemented within the framework of the Common Agricultural Policy (CAP) of the European Union. The planning of this policy embraces uniquely the area of three protected landscape areas (CHKO), in particular Blaník, Moravsky Kras and Bílé Karpaty. The fact that other areas are excluded from participation in these measures is considered by us as a serious drawback, significantly restricting the scope of such a measure.

The acceptance of the above measures will bring about the improvement of conditions, aimed at the generation of new work opportunities in these areas and will provide both for the stabilization of income and the increased effectiveness of the market, given the prevailing geographical circumstances. The functioning of the agri-environmental programs will be verified and terms for the application of these programs in a broader scope will be prepared. The implementation of the above measures will also bring about the reduction of differences in the quality of life in rural and urban areas and will support the development of biodiversity addressing a higher quality of living environment.

III. Measures to be taken for the purpose of generation of conditions for a comprehensive use of the plan:

III.1. Higher quality of training

Many different training schemes, to higher qualification or re-qualification, will be supported by this measure in the agricultural or rural production sectors.

III.2. Technical support

This group of measures is aimed at the generation of conditions necessary for a successful implementation of the plan and for the communication of skills and expertise to the farmers and to the rural population and, consequently, to increase the competitiveness of both the agriculture and the food processing industry.

Some final remarks on the SAPARD program:

> From the point of view of the Czech Republic it should be stressed that the annual financial contribution to SAPARD from the EU, amounting to 22 million EUR, is an extremely low level, both in terms of the aims of the planned measures and also from the point of view of the expectations of the farmers. Moreover, due to administrative problems, these means were completely unavailable during the year 2000, and the use of them in 2001 still remains highly problematic.
>
> The Czech SAPARD plan is focused on helping Czech agriculture meet EU standards and requirements. As a result, it is not focused on reforming or re-structuring Czech agriculture. Thus, most measures may serve to decrease specific impacts on the environment (e.g. reduce nitrate pollution of water), but do not go very far in making Czech agriculture fundamentally sustainable.
>
> An exception is the agri-environmental measures, focused on up to three environmentally sensitive areas, experience from which should be used in drafting

the National Agri-environmental Plan (which will be implemented upon accession and mostly with EU Structural Funds).

In other words: the focus here is not sustainability, but rather getting the Czech Republic into the European Union. Given the above qualifier, the plan is relatively good. Public participation/consultation has been limited, formal and restricted. A significant reason for this was certainly lack of time.

On paper the plan is one thing, implementation may well be quite another. For this reason, the process for monitoring and revision is crucial. The proposed process for monitoring seems adequate, but much will depend on the final composition of the monitoring committees. An independent advocate for the environment (including biodiversity) is completely missing at the national level. At the regional level (NUTS II), the monitoring committees will supposedly include 'regional environmental activities', but it remains to be seen what this will mean in practice.

It is imperative that the monitoring committees, not only at the regional, but also the national level, include strong and independent advocates for the environment.

2.2. Biodiversity – introduction

2.2.1. EU accession process and nature conservation in the Czech Republic

Since the late 1990s the environmental policy development has been driven by the prospect of future membership of the Czech Republic in the European Union and the need to harmonise Czech laws with EC legislation. A comprehensive process aiming to approximate the environmental legislation of the Czech Republic to the EU's was officially started. Since 1995, preparatory work has been under way to harmonise Czech nature conservation laws with EU directives, especially with the Birds and Habitats Directives. During this time, comparison of both legislative systems has been carried out for nature management and biodiversity protection. The overlap between the EC and Czech legislation in nature conservation is about 70%: in some aspects, the nature conservation legislation in the Czech Republic is even better developed. Special attention has been paid to establishing the NATURA 2000 Network. For this purpose, establishing the EMERALD Network under the Bern Convention can be used. The screening process started in January 1999, at the European Commission in Brussels.

2.2.2. National Programme on Agricultural Plant Genetic Resources Conservation and Utilisation

The genetic diversity existing within particular agricultural crops (the gene pool) is maintained by research and breeding institutions of all countries in so-called *collections of plant genetic resources*. Usually, registered or restricted cultivars, landraces, primitive cultivars, experimental lines (carrying significant genes) as well as wild relatives of cultivated plant are held in such collections. Genes and gene com-

plexes, which originate from these genetic resources, are utilised in the breeding of new, better-adapted cultivars, with higher yields of products and tolerance (resistance) to stress.

Similarly to other countries, the diversity of crops thet are widely grown in agricultural systems has decreased also in the Czech Republic. Diversity of local well--adapted varieties has been replace by a much narrower spectrum of not-too genetically distant cultivars during the last century, and especially during the last 40–50 years. In many cases, valuable and irreplaceable resources were lost.

The Czech Republic has a long tradition, and skilled specialists, in the sphere of plant genetic resources. The *Operational Information System on Plant Genetic Resources* (EVIGEZ) is available, as well as a national gene bank for the conservation of all seed-propagated collections, with technology meeting international standards. A crisis in plant genetic resource study and conservation came in the early 1990s due to strong cuts in the budget for agricultural research, privatisation of the institutes supervising the collections (or even their abolishment) as well as due to the splitting of the former Czechoslovakia into the Czech and Slovak Republics. These unfavourable circumstances have been overcome by the decision of the Ministry of Agriculture of the Czech Republic in 1993 to launch *The National Programme on Plant Genetic Resource Conservation and Utilisation.*

This project covers all basic activities on plant genetic resources (PGR), namely: collection of material (including land races and wild relatives); its characterisation, evaluation, documentation and conservation; and services to users. At present, eleven institutions in the Czech Republic are involved in this project, three of them represent the public sector and eight belong to the private sector (firms dealing with agricultural research, breeding and services for agriculture). The project is guaranteed by the Department of Gene Bank in the Research Institute of Crop Production (RICP) Prague–Ruzyně, co-ordination and consultations are provided by the Czech Board on Plant Genetic Resources, of which representatives of the Ministry of Agriculture, Gene Bank, curators of collections, breeders and other specialists are members.

The RICP also provides services of the above EVIGEZ and long-term maintenance of all seed propagated collections. At the end of 1997, 49,163 accessions of PGR were maintained in all collections in the country, among them 8,232 accessions of species propagated vegetatively (16.7%). The Czech Board on Plant Genetic Resources serves as an advisory body to this project.

The programme has the following goals and main tasks:

1. Long-term conservation of plant genetic resources for future needs.
2. Gathering (including collecting missions), evaluation, documentation and long-term maintenance (in both active and base collections) of indigenous plant genetic resources.
3. Systematic and concentrated effort to increase collections that meet the needs of local breeders and researchers and gathering broad genetic diversity.
4. Systematic evaluation and study of collections and their description, aimed at the choice of convenient donors of important characters.

5. Documentation of plant genetic resources, creation of databases of passport and evaluation data, international exchange of data.
6. Widening of the spectrum of collections with new crops in co-ordination with the needs of farmers and breeders.
7. Gathering knowledge on plant genetic resources for the further development of breeding, and broadening the existing diversity of both crops and cultivars in plant production.
8. Access to plant genetic resources and relevant information for users within the country and abroad. International exchange of information.

In 1997 the collections increased by 2,756 newly arrived accessions. Most of them (1,685 accessions) were obtained through international exchange, 549 accessions were provided by local donors. Important material was collected within the country (416 accessions) as well as abroad (106 accessions), most of them are wild relatives and land races of fodder crops, medicinal plants, vegetables and fruit trees. These activities are primarily oriented towards endangered species and natural localities. Extensive exchange of PGR between the Czech Republic and the Slovak Republic was aimed at filling gaps in those collections in both countries, which were located only in one of both parts of former Czechoslovakia.

Significant progress has been reached in PGR documentation in the last two years. Passport data are now available for more than 95% of accessions in collections. Also the amount of evaluation data has almost doubled when compared to the previous year and reached 10,252 accessions (23.5% of all accessions in collections). Other relatively extensive files of evaluation data are being processed and will soon be included in the information systems.

As is obvious from this survey, whereas almost all collections are well documented for passport data, the level of documentation concerning evaluation data is very different, according to institutions. Evaluation data can increase the value of PGR for users, therefore fast progress in this field is one of the priorities.

Beside the databases of passport data and evaluation data, documentation of the seed store in the gene bank is also an important part of the EVIGEZ information system. In 1997 new activities in EVIGEZ have been initiated – technical and personal preconditions were created for approaches via the Internet as well as for an image analysis application within the system. Important activities in this respect are also carried out at international level. The Czech Republic has responsibility for the European Wheat Database (in co-ordination with France, the counterpart in the Czech Republic is RICP Prague), European Flax Database (AGRITEC Šumperk) and databases of selected grasses (GRS Zubří).

Study and evaluation of collections have been carried out by all institutions. Evaluation data are based on the National Descriptor Lists, which are now available for 29 species (or genera). In 1997 new Descriptor Lists for *Cicer, Linum, Cucurbita, Cucumis, Lactuca, Tulipa, Vitis* and for grasses were completed, which prepares for further progress in the evaluation of the collections.

The basic task of the work on genetic resources is their maintenance for future generations. Therefore, fast regeneration of endangered accessions and their conser-

vation under standard conditions is very urgent, especially in seed propagated species, where part of the collections is still maintained outside the gene bank and will have to be regenerated first. There were 7,163 accessions regenerated in 1997 and 4,160 of them were transferred into the active collection in the gene bank (-5°C), accessions of local origin also duplicated in the base collection (-15°C). Institutions involved in the National Programme on Plant Genetic Resources distributed 2,807 samples to local users and 1,461 accessions were sent abroad (Dotlačil, *unpubl.*).

2.3. The state of genetic resources

2.3.1. History of protection and use of farm animals genetic resources

Protection and use of farm animal genetic resources has a long tradition in the Czech Republic. A new trend in the care of animal genetic resources, developed since the 1960s and 1970s within FAO, was applied at the very beginning even in the former Czechoslovakia. Czechoslovak specialists participated in important international meetings, such as the FAO Meeting in Rome in 1985, and in Warsaw, in 1986. Numerous national meetings were also organized on the importance and methods of protection for endangered farm animal genetic resources by the Czechoslovak Academy of Agricultural Sciences and by the Ministry of Agriculture in Prague and in Bratislava. These efforts resulted in the adoption of a new Act No 240/1991 on Breeding and Reproduction of Farm Animals and its Decree No 326 of May 15th 1992. The species and breeds of farm animals included in this Act became a basis of further development of directed protection and the use of farm animal genetic resources.

In 1992 the Czechoslovak Academy of Agriculture Sciences published the book *Keeping and Use of Genetic Banks in Breeding of Farm Animals* (Textbook of CAAS No 159, Prague 1992). *Project on Protection of Genetic Resources of Farm Animals* was elaborated for the Ministry of Agriculture of the Czech Republic. In 1995 the Research Institute of Animal Production in Prague – Uhríněves (RIAP) was nominated the National Focal Point for co-operation with FAO.

The Research Institute of Animal Production also prepared the *National Programme of Preservation and Utilisation of Animal Genetic Resources* (1995), organized discussion on methodology of protection and use of individual breeds (1996) and nominated the Council of Animal Genetic Resources (1997). Technical and organizational measures are continually taken in co-operation with the Ministry of Agriculture, breeding confederations, research institutes and agricultural universities within the FAO Global Programme.

2.3.2. Genetic diversity of farm animals and its management

The usage/and development of active high input – high output breeds is very well organised in the Czech Republic, due to a long-term breeding policy of all farm animal species, accompanied by a high quality of selection and hybridisation programmes including breeding value estimation of individual animals, reproduc-

tion and production monitoring being a permanent process. Moreover, since 1991, the Act No 240 on Breeding and Reproduction of Farm Animals has been in force, amendments to which are being prepared.

In accordance with the Convention on Biological Diversity, FAO began to develop activities regarding management of global animal genetic resources. In the Czech Republic, the Research Institute of Animal Production Prague-Uhríněves (RIAP) was designated National Focal Point (NFP) to co-ordinate such actions.

The Czech Republic (and former Czechoslovakia) devoted much effort to the conservation of animal genetic resources of small and mainly autochthonous breeds. Purposeful support and preservation of such animals cannot be omitted, not only from the biological, but also from cultural and historical point of view.

The previously mentioned Act No 240 includes a separate article on farm animal genetic resources, and the decree published later indicates the actual breeds. The Stud at Kladruby has already existed for more than 400 years, where in 1995 the breeding of an autochthonous horse 'Old-Kladruby' was declared a Natural Cultural Monument under the name *National Stud in Kladruby*. The stud was founded in 1579, and at present includes approximately 130 full-blood mares of both colour varieties (white and black) with complete pedigrees. The function of the National Stud in Kladruby is supported by the Ministry of Agriculture of the Czech Republic.

As has been mentioned, the Research Institute of Animal Production in Prague--Uhríněves, in agreement and with assistance from the Ministry of Agriculture, prepared in 1995 the *National Programme of Preservation and Utilisation of Animal Genetic Resources*. The National Programme includes methodical projects of the protection and utilisation of local animal genetic resources, elaborated by responsible supervisors (mostly scientists) under the leadership of the NC. It was reviewed by the Ministry of Agriculture of the Czech Republic, universities, breeding associations and research centres.

Most of the supervisors are members of the Council of Animal Genetic Resources, appointed by the Director of NFP as an advisory and consulting body of NFP and NC.

The list of breeds included into the *National Programme* covers all the animal breeds indicated in the above-mentioned Decree No 326/1992 to the Act No 240/1991 (Váchal, 2000):

- Cattle: Czech Red;
- Horses: Old-Kladruby horse, Hutzul;
- Pigs: Presticke Black pied;
- Sheep: Šumava sheep;
- Goats: White and Brown shorthaired;
- Poultry: Czech gold brindled hen, Czech goose

and additionally selected species and breeds:

- Cattle: Czech Spotted Cattle;
- Horses: Silesian Norik;

- Fishes: Carp, Trout, Tench and others;
- Rabbits: 6 local breeds;
- Coypus (Nutrias): 3 local breeds;
- Bees: Carnica bee.

The breeders of the breeds included in the National Programme receive from the State (Ministry of Agriculture) annual financial support according to precisely formulated conditions, prepared annually by NFP and published each year by the Ministry of Agriculture of the Czech Republic as the so called *Rules of Financial Support to Animal Genetic Resources.* Every year it is precisely determined for individual breeds and pertinent breeders, under which conditions it is possible to apply for subsidy for the sire, breeding dam etc. in the given year. Every breed project has its responsible supervisor and collaborating institution or breeders' association.

The defined amount of financial support from the state budget is distributed every year to the individual breeders of all species/breeds, NC and mainly to the collaborated organisations within the National Programme.

The *Annual Report,* which includes the description of NC and NFP activities, including the international ones, the budget distribution and reports of individual supervisors is prepared and discussed at the Council of Animal Genetic Resources. Techniques for cryo-conservation are being developed for selected breeds of cattle and fish. Genetic analyses (polymorphic protein and DNA microsatellites) have been carried out in fish (from blood samples of 525 carps, 42 trenches and 50 other fishes), in Red cattle and Old-Kladruby horses. NFP is interested in deeper research and use of cryo-conservation and usage of methods of molecular genetics for monitoring, storage and cryo-conservation of existing animal genetic diversity of the breeds included in the National Programme.

According to the *Primary and Secondary Guidelines for the Development of National Farm Animal Genetic Resources Management Plans*, the development of further activities is foreseen. This requires the permanent modification of all individual projects and their management, in co-operation with the organisation of cryo-conservation of existing genetic material of all animal numbers from limited populations and including DNA monitoring of the breeds for the studies of genetic diversity.

2.3.3. Proposaled National Strategy of Biodiversity Protection

The official "Strategy" is a large document compiled under the auspices of the Ministry of Environment. The Ministry of Agriculture will only be partly involved.

Biological Diversity Strategy and Action Plan

The first steps to prepare the *National Biodiversity Strategy* were made in the former Czechoslovakia as early as in 1992. Under the supervision of the Federal Committee for the Environment, the *National Report of the Czech and Slovak Federal Republic* was compiled by leading experts of the Czechoslovak Academy of Sciences for the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, in June 1992 (Moldan 1992). The process to prepare the *National*

Biodiversity Conservation Strategy started in September 1992, but it was stopped in January 1993, when the two sovereign countries were established.

In 1997, the MoE began to prepare both the *First National Report* as well as the *National Biodiversity Conservation Strategy of the Czech Republic*. The Agency for Nature Conservation and Landscape Protection of the Czech Republic was charged with co-ordinating both documents. The documents should deal with biological diversity at all three generally recognised levels (*i.e.* genes, populations/species, habitats/ecosystems) and they should be based on an integrated approach, joining both biodiversity protection and maintenance of life-supporting ecosystem functions.

The objectives of the *National Biodiversity Conservation Strategy*, which should include both a national strategy and a more detailed action plan, is to implement the principles of the CBD in the Czech Republic in more detail through national planning in various sectors, to contribute significantly to a long-term protection of the country's natural heritage and to its sustainable use, and to stop and reverse the degradation of biological and landscape diversity in the Czech Republic, using *e.g.* the framework of the *Pan-European Biological and Landscape Diversity Strategy*.

In the course of the project, all relevant data on biodiversity, namely at the population level, should be gathered in target groups or taxa (number of described, endemic, keystone, flagship, umbrella, focal, rare or threatened and extinct species) and analysed, using new IUCN criteria for Red List categories (IUCN 1995), experience from other countries (WRI/UNEP/IUCN 1995) and SBSTTA and the Conference of the Parties resolutions and recommendations (UNITED NATIONS 1997, 1998). In addition, the same process should be applied for communities and habitats. Consequently, biodiversity hot-spots should be identified within the country. The same inventory will taken for cultivated plants and domesticated animals. Threats to the Czech Republic's biodiversity will be reviewed in detail, including factors threatening the genetic diversity of domesticated species.

A concept of a comprehensive biodiversity programme for the country entailing a wide variety of activities should then be developed. The *"scenario analysis"* will aim at land and resources management, protected areas, non-reserved lands including Territorial System of Ecological Stability of Landscape as a basis for the European Ecological Network (EECONET, Bínová *et al.* 1995) and sustainable resources management. For areas which have been severely degraded or even destroyed, proposals for their restoration should be prepared with respect to biodiversity conservation, using restoration-ecology principles. The *National Biodiversity Conservation Strategy* should also deal with the legislation, conservation administration and policy, environmental education and eco- and agro-tourism. The *Action Plan* should identify both priorities for immediate actions and effectively support and develop national policy on biodiversity conservation in the long-term.

In addition to the governmental sector actions, some NGOs, *e.g.* the Czech Union of Nature Conservationists and the Society for Sustainable Living, as leading voluntary conservation bodies in the country, are supposed to be significantly involved in the process of preparing the *National Biodiversity Strategy in the Czech Republic* (Ministry of the Environment of the Czech Republic, 1996).

Preparation of the *National Biodiversity Conservation Strategy* has been funded by the Government of the Czech Republic through a special grant from the Council for Research of the Government of the Czech Republic to the Agency for Nature Conservation and Landscape Protection of the Czech Republic. In 1998–1999 some parts of the project were financed by the GEF through the World Bank.

3. Lithuania

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3.1. Agriculture and rural development

3.1.1. General situation

- Total area of the country – 6.53 million ha
- Total population – 3.7 million
- Agricultural land – 3.37 million ha
- Arable land – 2.94 million ha
- Rural population – 31.8%
- Active in agriculture – 19.2%
- Registered family farms – 67.800
- Average farm size – 12.6 ha
- Agricultural share in GDP in 1999 – 8.6%
- Value of agricultural and food products in total exports – 1.51 billion LTL (12.6%) in 1999
- Value of agricultural and food products in total imports – 2.16 billion LTL (11.2%) in 1999
- Value of agricultural and food products exports to the EU – 395 million LTL (26.2%) in 1999
- Value of agricultural and food products imports from the EU – 1.175 billion LTL (54.2%) in 1999

Of the 6.5 million hectares of total area, the utilised agricultural area (UAA) at the beginning of 1998 equalled 3.502 million hectares, or 54 per cent of total country area. Arable land was the most important. It accounted for 2.946 million hectares (84.1 per cent of UAA), followed by meadows and natural pastures (496 thousand hectares, or 14.2 per cent of UAA) and permanent crops (60 thousand hectares, or 1.7 per cent of UAA). There have been no substantial changes in Lithuania's land cover in recent years.

Recent trends indicate that Lithuania is in a situation where farmers are abandoning marginal agricultural land. This development has especially accelerated since the restoration of Lithuanian independence and the cessation of centralised regulation of farming procedures.

The amount of abandoned agricultural land may be around 200,000–450,000 hectares. Some 90% of the abandoned land belongs to private owners – or will do so, once the land reform has been completed. According to the estimates of the experts on land use, by the beginning of 1999, the abandoned agricultural land amounted to 360,700 hectares (10.2% UAA).

Due to geo-political and historical constraints, Lithuanian rural areas and agriculture play an important economic and social role. In 1998, Lithuanian agriculture created 10.1% of the total GDP, while the number of people in the agricultural sector constituted about 21% of total employment.

Table 3.1. Agriculture in the national economy, 1998

	GDP (m. LTL)	%	Employment	%
Lithuania	42767.9	100	1669.2	100
Agriculture Sector	4319.6	10.1	354.6	21.4

In the period 1993–1997, the major sectors' share of GDP changed significantly. The services sector grow rapidly: its share of the GDP jumped from 46.5% in 1993 to 58% in 1998. Despite a fall of this share in recent years, Lithuanian agriculture and the countryside still remain an important creator of national wealth: the agricultural sector contributes a stable share to the GDP of 10.1%. Moreover, Lithuanian agriculture was a main engine for the real GDP growth in 1995–1996.

Table 3.2. Agriculture and the national economy, 1993–1998

	1993	1994	1995	1996	1997	1998
Real GDP growth	-16.2	-9.8	3.3	4.7	7.3	5.1
Contribution of:						
Agriculture	14.2	10.6	11.7	12.2	11.7	10.1
Industry	34.2	27.0	26.1	25.8	25.2	23.6
Construction	5.1	7.2	7.1	7.1	7.7	7.9
Services	46.5	55.1	55.0	54.9	55.5	58.5
Employment:						
Lithuanian total	1778.2	1675.0	1643.6	1659.0	1669.2	1656.1
Agriculture	22.4	23.3	23.7	24.1	21.7	21.4

In 1997 Lithuanian agriculture created 12.3 % of the GDP. More than one fifth of the country's labour was employed in the agricultural sector.

The population of Lithuania is currently about 3.74 million, 32% of which are rural residents and about 17% of working people have their main income from farming.

At the end of 1998, 1.177 million people lived in rural areas, i.e. 31.8% of total Lithuanian population.

Two main production types prevail in Lithuania, but it is a country where animal breeding is predominant in agriculture: plant products total about 30% and cattle breeding 67% of agricultural production.

Currently, three different types of farm characterise Lithuania's farming structure:

- Agricultural companies;
- Family farms; and
- Household plots.

Table 3.3. Farm structure in 1997

	Number	%	Average size, ha	% of UAA
Family farms	196,000	36.3	11.7	40.9
Agricultural companies	1,660	0.3	371.6	10.2
Household plots	342,700	63.4	2.2	19.6

Agricultural Companies are large-scale, corporate type enterprises created as a result of the transformation of state and collective farms. In addition to primary agriculture, they are involved in agro-processing and trading activities. By 1998, 1,495 agricultural companies remained active, having an average farm size of 337.9 ha.

The creation of so-called *Family Farms* started before Lithuania gained its independence. Currently, a family farm is considered as a farm registered on the Farm Register. By 1998, 57.8 thousand family farms owned 608 thousand hectares of land. The third type of farms is *Household Plots* with an average size of 2.2 ha.

Household plots are often operated by shareholders of agricultural companies or by rural inhabitants, in order to supplement their income from other sources. They still account for a significant share of the income generated by rural inhabitants.

The changes in the farm structure are obvious. The number of family farms has been increasing since 1991, while there has been a decline in the number of agricultural companies and household farms. Another trend prevalent in recent years is the growing role of Lithuanian private plots (including family farms and household plot owners). Private farms have already become key players in Lithuanian agriculture. In 1997, private farms contributed 75.8% to gross agricultural output, while the share of agricultural companies declined to 24.3%.

However, private farms are not inclined to set up specialised farms. Approximately 82% of family farms are engaged in mixed agricultural production. Approximately 12% of all farms specialise in crop production, and 4% in livestock.

As a large proportion of agricultural output is produced on private farms that are comparatively small and unspecialised, primary agricultural production has become very fragmented. Consequently, high farm fragmentation has resulted in lower productivity and a poorer quality of agricultural produce.

3.1.2. Forestry

Lithuanian forests are important for their natural resources. The forests cover approximately 2 million hectares, or 30% of the total Lithuanian surface area. The dominant tree species are pine and spruce. The coniferous species account for some 60% of trees, and deciduous tree species, such as birch, black alder, grey alder and aspen, for some 40%. 27% of forestland is subject to conservation restrictions, e.g. aiming to conserve bio-diversity. Commercial forests make up some 73% of Lithuania's forests. Forest types predominant in Lithuania do not directly relate to the forest types listed in Annex I of the Habitats Directive; however, there are other types of habitats (e.g. wooded dunes) that are included in appropriate categories of protected areas, and are protected by Lithuanian laws. Most of the Lithuanian forests occur in the southeast part of the country where soil productivity is lower.

Most of Lithuania forests are State owned, with private forests making up about 5% (more than 91,000 hectares). It is estimated that, by the end of land reform (in the second half of 2000), private forests will cover from one third to one half of total forestry. 27% of forestland is subject to conservation restrictions, e.g. aiming at conserving biodiversity.

Wood is important for export. In 1997 and 1998, wood products accounted for 5.1% and 4.8% of total Lithuanian export. In recent years, Lithuania annually produced more than 4.1 million m^3 of wood. Average annual yield per hectare of forest was 6.3 m^3 of wood.

Table 3.4. Lithuanian forestry, 1996–1998

	1996	1997	1998
Planted and sown forest (ha)	8,508	10743	10,169
Forest felled			
(thous. $m^{3)}$	4,771.1	4,259.6	4,122.1
(thous. ha)	199.7	215.3	199.1
Exports (thous. t)	1,725.3	1,484.1	1,323.6

As most of the forests occupy areas where soil productivity is low, forestry provides an important alternative source of additional income for rural dwellers. For that reason, forestry is considered as one of diversifying activities in rural areas, able to contribute to the provision of additional employment. At the moment, especially non-wood forest product utilisation provides a sound basis for rural development initiatives, which aim to increase income-earning opportunities while maintaining environmental quality. Moreover, afforestation of abandoned agricultural land might make a positive impact on environmental sustainability as well as provide opportunities for additional income.

As a result of intensive and irrational farming Lithuanian forests are in a critical state (disproportionate numbers of coniferous and deciduous trees, small percentage of mature forests, uneven distribution of mature forests, excessive forest felling, young trees being felled, violations of forests, etc.). Part of the forests has died out due to industrial pollution (Jonava, Kėdainiai etc.). Today, the overall afforestation in Lithuania is too small, especially in its northern and central parts. The forest

cover is smallest in the karst region, 7% to 10%. Soil erosion is intensive there, waters are polluted, the ceno- and geno-pools are degrading (synanthropisation processes take place in natural communities). There is much dying out of the associated flora and fauna caused by clear cut, which is a real threat to the existence of this forest community.

Lithuanian forestry policy is based on the principles of sustainable forest management, and, first of all, is aimed at:

- Implementation of resolutions of Strasbourg (1990), Helsinki (1993) and Lisbon (1998) Ministerial Conferences on Protection of Forests in Europe;
- Development of sustainable and multiple-use forest management;
- Protection of biodiversity;
- Increasing of forest area via afforestation of abandoned agricultural land;
- Development of forestry research, education, extension and etc.

The principles underlying Lithuania's forest policy are set out in the Forest Law. The Forest Law was issued in November 1994, and updated in 1996. The Forest Law establishes rights and duties of all forest managers, owners and users of the Republic of Lithuania to utilise, reproduce, grow and protect forest; it strikes a balance between the interests of forest owners and society, and establishes the main principles of forest management. The Forest law covers all main issues of forest policy: trends of forestry policy, forest ownership, forest management and supervision, economic regulation of forestry, forest use, regeneration, growing and felling, forest protection, etc.

In addition to the law a "Forestry and Forest Industry Development Programme" was approved by the government in 1994 and updated in 1996. It contains many issues related to forestry policy. The Action Plan, which is annexed to the programme, foresees the actions to be undertaken in the forestry sector, up to the year 2023.

3.1.3. Soil drainage and irrigation

Drainage and irrigation systems affect the natural environment. A country-wide mean of 85% of Lithuania's agricultural area is drained by pipe drain systems. The total drainage area is estimated at 3 million hectares, of which 2.6 million have a functioning drainage system. The drainage system is very important for Lithuanian agricultural production, because climate and geographic conditions lead to a surplus of moisture.

Pipe drainage systems were installed during the Soviet period on a huge scale, without much consideration for the real need and economics of the investments. As a result, areas in which pipe drainage contributes to a high agricultural potential are mixed with locations where its additional benefits are marginal. In other areas agricultural potential is low, and other forms of land use are preferred. Most the land reclamation systems installed now need replacement. Large investments are required to rehabilitate the land reclamation infrastructure to make it contribute to sustainable farming.

The land reclamation infrastructure is the property of Land Reclamation Service, which is responsible for maintenance, except in the case of restoration of property rights to claimants. It is proposed to establish Land Reclamation Boards, as independent single-purpose public institutions. To take up this initiative, investment support is required.

Irrigation systems cover almost 8,000 ha of farmland. Restructuring of agriculture made some irrigation systems redundant, and they are abandoned. About 60 per cent of irrigation systems continue to function.

3.1.4. Environmental impacts and environmental problems caused by agriculture

The major environmental issues related to agriculture are soil erosion, pollution of surface water and groundwater, as well as use of fertilisers and pesticides.

Pollution of surface water and groundwater is of primary concern. Groundwater is the main source of drinking water in Lithuania. Drinking water supply faces serious problems, particularly in rural areas and on the outskirts of cities, where piped water supply is less common. Today, approximately 300,000 (dug) wells produce drinking water from shallow wells for nearly 1 million people. National groundwater quality is monitored, as well as the well-water quality: in 1996 it was estimated that 60 per cent of dug wells did not meet hygiene standards, and 37.5% were polluted by nitrates.

Severe pollution of surface and groundwater by nutrients from large-scale pig and poultry breeding units and livestock production is common and problematic in rural areas. Major environmental problems result from 24 large pig-breeding complexes, each producing between 12,000 and 54,000 pigs per year (in 1997, 520,000 pigs were raised), and 5 large poultry farms. The problems result primarily from inadequate waste storage facilities and poor application of waste treatment technology.

In recent years, due to a decline in industry, point-source pollution has decreased, while non-point source pollution, which mostly results from agriculture, was increasing until 1995, and only in last couple of years started to decrease.

Another major environmental concern related to agriculture is soil erosion. 14–15% of Lithuania's arable land is subject to erosion, resulting in a loss of valuable topsoil and productivity. The average loss of soil from agricultural land is approximately 1.8–2.5 tonnes per ha per year. More pronounced erosion is occurring in west Lithuania, amounting to 12–15 tonnes per ha per year.

Use of fertilisers and pesticides is one of the most important sources of soil contamination with heavy metals. On average, fertiliser application fell to 99 kg per ha per year in 1997. In 1991, 196 kg of fertiliser was applied per ha. Before the agricultural reform, average annual pesticide use stood at some 2.0 kg per ha. Recently, average use remained below 0.5 kg per ha (0.363 kg in 1995 and 0.477 kg in 1996 per ha). Generally, the economic recession and financial difficulties of farmers explain this reduction. Though fertiliser application fell, accumulative effects may represent potential environmental danger.

Drainage and irrigation systems affect the natural environment.

Most land reclamation works in Lithuania were carried out during 1966–1990. In separate years, 120–140 hectares of land per year was drained. This created very good conditions for intensifying agricultural production and improving the social conditions of people. On the other hand it brought environmental damage.

Farm enlargement and field improvement requires straitening of streams, cutting of shrubs and even forest felling and drainage of peat lands. For this reason, the hydrological regime has been considerably changed, erosion has increased, wetlands and natural pastures decreased, the landscape was changed, ecological corridors were stopped, biodiversity has decreased. The most important problem caused by drainage is increased leakage of nutrients, that contributed to the worsening of ground water quality.

The state funds for the maintenance of drainage installations are decreasing every year. After Lithuania joins the EU, it is not realistic to expect support for this sector. Up to now, and most probably in the future also, farmers can contribute very little to operating the drainage installations. In this way, re-naturalisation of part of drained land less suitable for agriculture will be promoted.

Although drainage is now only a minor problem in Lithuania, private farmers could use it in order to increase their arable area (although there are some restrictions in protected areas).

3.1.5. Impact of agriculture on biodiversity

During the Soviet period, biological diversity was most adversely affected by land drainage, which resulted in the drying out of natural meadows and wetlands, small rivers were canalised, river valleys were damaged, small plantations in fields and in single farmsteads were cut. A wide variety of chemicals were used in vast monocultures of arable fields, including misbalanced use of fertilisers, fungicides, herbicides and other pesticides. Pollution of soil, lakes, rivers, the Curonian Lagoon and the Baltic Sea with chemicals from agriculture, with farm dung effluent as well as waste water from cities and settlements, all increased. Eutrophication processes in lakes were intensive. As a result of all this the processes of vegetation and wildlife succession took place, and plant, animal and fungi species became extinct. Single farmsteads were systematically destroyed leading to the destruction of the land uses traditionally based on a balanced use of organic fertilisers; the genetic stock of many cultivated plant varieties and of domestic animal and bird breeds was irretrievably destroyed.

Changes of agricultural intensity in any direction causes a certain fluctuation of biodiversity structure and species numbers. For this reason, any farming activities have a direct impact on the environment.

Before independence in 1990, Lithuanian agriculture was steadily intensified, with increase of chemisation, increase of agricultural land at the expense of nature. So, many valuable biotopes and habitats were destroyed, and some species reached critical minima. Big losses of biodiversity were caused by intensive grazing and mowing. Early mowing destroyed many nests and young birds, as well as rare plants that did not survive to set seeds.

Intensive use of pesticides and fertilises resulted in drastic decrease of populations of some birds of prey, pollution of open water bodies, which caused decrease of aquatic animal populations (for instance, crayfish), intensive eutrophication caused degradation of rare communities of water plants.

Most often intensive farming has a negative impact on biodiversity, although in recent years the opposite process is also taking place in Lithuania. The agricultural crisis speeded-up the degradation of meadow and other "open" habitats. This happened due to the decline (and in many cases – abandonment) of farming activities in some areas. After regaining independence, with decreased agriculture and increased fuel prices, use of meadows and pastures has significantly decreased. First of all the less favoured, most often wet areas that were at further from farms were abandoned, and these areas were the most valuable ones from the biodiversity point of view. In such wet areas that were mowed and grazed, rare species of waders and other meadow birds that are protected in Lithuania and the EU were breeding. Currently successional processes are taking place in those abandoned areas, and the open areas are becoming overgrown with bushes and tall grasses. Such conditions lead to local losses of these habitats, and thus of the rare bird populations.

3.1.6. State support programmes for agriculture

Transition to a market economy and restructuring of the agricultural sector led to an acute need for investment. With a view to accelerate structural changes in agriculture, a decision was made to establish the *Rural Support Fund* (RSF) in 1997 as the sole source for financing agricultural and rural development. From the 1st of January 2001, the RSF was reorganised into a Special Rural Support Programme, which continues the activities of RSF. Currently, it is a main agriculture and rural development policy instrument. Later, a sister institution – the *Rural Loan Guarantee Fund* was set up. In terms of its assets, the Fund was liable to fully or partially secure the loans extended to farmers, thereby resolving the problem of a lack of collateral. The state budget is the main source of those two funds. RSF aims at providing financial support to farmers, stimulating rural development and promoting the export of agricultural products. Financial support from RSF is provided in the form of grant aid or subsidy. The Rural Loan Guarantee Fund provides guarantees for farmers applying for a loan.

Financial resources of the RSF are basically used for the following programmes:

- *Agro-food market regulation measures*. These include subsidies for farmers and other agricultural holdings, as well export subsidies for processors of agricultural products. Intervention policy measures of the Lithuanian Agriculture and Food Market Regulation Agency were financed from the same budget line of the RSF.
- *Priority investment measures*. These include grant aid for investments in agricultural holdings, settlement of farmers and farm modernisation, introduction of new technology, stock-breeding, registration and identification of livestock, organic farming, diversification of rural activities in less favourable areas, subsidised interest rate on long-term loans for farm improvement and other

activities, support for the establishment of the alternative employment in rural areas, rural infrastructure etc.

- *Technical assistance, training and research*. This programme provides funds to farm advisory services, the establishment of agricultural information systems, research projects in the field of agriculture and rural development etc.
- *Rural Loan Guarantee Fund*. Financial resources are allocated to secure farmers' loans.

In general, total annual RSF budget is about 266 million LTL. The agro-food market regulation measures account for the largest proportion of RSF financial support: they usually take up more than 60% of the total RSF budget. The priority investment measures receive about one quarter of the total financial support.

Table 3.5. Major programmes of the Rural Support Fund, 1997–1999 (million LTL)

Major programmes	1997		1998		1999
	Budget	Actual Use	Budget	Actual Use	Budget
1 Agro-food market regulation measures	233.0	256.2	207.0	234.8	247.0
2. Priority investment measures	123.0	94.3	110.0	101.2	119.0
3. Technical assistance, training and research projects	23.0	20.2	23.0	22.8	23.0
4. Rural Loan Guarantee Fund	20.0	8.0	45.0	19.7	22.0
5. Other measures*	-	21.0	-	68.8	-
6. Other measures funded from Privatisation Fund	-	-	-	75.7	-
TOTAL	399.0	399.7	385.0	523.1	411.0

* Most of ''other measures" is priority investment measure, although introduced during the financial year.
Source: The Rural Support Fund database

Regarding the priority investment programme, financial support from RSF is focused on the following:

1. Support for farm establishment, farm modernisation and improvement of rural infrastructure. Since the establishment of RSF, this measure has been the most important in terms of attention and allocated funds. Under this measure, actions directed to improve the rural infrastructure were supported. These include electrification, construction or reconstruction of rural roads, installation of water supply systems, etc. In addition, support for reconstruction and construction of production facilities, purchase of new farm machinery or equipment is provided. Young farmers are provided with particularly favourable terms of financial support. In 1998, this measure absorbed 67.9 million LTL.

2. Support to co-operative and agro-service enterprises. Under this measure, co-operatives and agro-service enterprises are granted aid for investments in production facilities, new machinery, equipment and technologies. Though

this measure is a top priority in RSF, only 1.2 million LTL were allocated in 1998.

3. In recent years, particular focus is put on new technology measures. This measure promotes new technologies in primary agriculture, as well in farm diversification. In 1998, total RSF expenditure for these purposes was 2.2 million LTL.
4. Support to organic farming. In addition to grant aid for investments in development of organic farming, premium payments per hectare are provided. In 1998, this measure absorbed 1.4 million LTL.
5. Farming restructuring in less-favoured areas. Financial support in the form of grant aid is provided to agricultural holdings in less-favoured areas. In 1998, 1.7 million LTL was allocated for this purpose.
6. Compensation of loan interest. Farmers and agricultural enterprises are eligible to receive the compensation. The compensation is provided for investment loans. In 1998, 6.0 million LTL were paid as compensation for investment loan interest.

Table 3.6. Priority investment measures, 1997–1998 (million LTL)

Measures	1997	1998
1. Farm setting up & modernisation	61.6	68.9
2. Co-operation & agro-service	0.2	1.2
3. New technologies buying	2.8	2.2
4. Animal breeding	20.2	17.6
5. Organic farming	1.1	1.4
6. Farm transforming in LFA	2.1	1.7
7 Quality research system	6.3	8.2
Total	94.3	101.2

Source: The Rural Support Fund database

In 1998, more than 6 thousand applicants received grant aid for investments. Almost 3 thousand projects involved improvement to rural infrastructure, and 2.5 thousand projects applied for refunds for farm machinery or equipment (e.g. tractors, harvesters, milking and cooling equipment etc.).

Average grant aid was comparatively small: it hardly exceeded 12,000 LTL. Volume of grant aid for projects involving improvement of rural infrastructure was bigger – more than 16,000 LTL (see Annex, Tables 2 and 3).

To regulate the market in agricultural products and secure income for agricultural holdings, the Ministry of Agriculture has applied subsidies for agricultural products sold to farmers and other agricultural economic entities. The market regulation of agricultural products was based on the price administration model. On average agro-food market regulation measures accounted for more than a half of Rural Support Fund available. However, the experience showed that the market regulation model selected was not effective enough, and did not speed up restructuring of agriculture and food processing sectors.

Development of agriculture has changed the procedures for support. The following trends can be distinguished here:

- Support for income of farmers with sound finances and business plans, through setting support criteria, stimulation of development of commercial farms, concentration and specialisation of production, and farm enlargement by using economic incentives.
- To set direct payments per hectare of crop and livestock unit.
- Instead of state regulation of the market, setting minimum purchase prices and additionally paid subsidies.
- To purchase surplus production at minimum prices that comply with world market or export market prices.
- The Market Regulation Agency makes purchases of major products at the peak time of production only at prices lower than export market prices. Losses of the Agency are only storage costs.
- Support for partial compensation of private storage costs (for 'peak' products).
- With decrease of domestic market prices to the world level, gradual abolishment of export subsidies, protection of market by import duties, elimination of minimal import prices and non-tariff barriers in trade, transition to customs evaluation procedures (WTO requirements).

Thus, recently the Ministry of Agriculture has elaborated the following major strategic objectives regarding state aid policy:

- to change subsidy payments for agricultural production from the 'production sold" model to priority investment support (grant aid schemes) and direct payments per hectare/per head,
- to implement measures of agri-food market regulation and export promotion programme, and guarantee financing of the programme,
- to implement a market intervention model which is applied in EU countries.

These objectives also aim at restructuring the Market Regulation Agency, and change its operation from price administration to market intervention model. With the aim of restructuring the Market Regulation Agency, amendments in legal basis of the Republic of Lithuania have been prepared. The amendments of Law on Economic Relations in Agriculture have introduced targets and intervention prices for agricultural products, as well as the principles of the market intervention model. The restructuring from the price administration scheme to market intervention model will allow the Market Regulation Agency to operate more effectively, and at the same time promote the restructuring of enterprises.

3.1.7. Institutions/organisations involved in agriculture and rural development policy

Agricultural and rural development policy is set at national level. Administration and implementation of policy is carried out at national, regional (county) and district levels. In policy formation, the Ministry of Agriculture plays a major role. It approves agricultural and rural development directions and measures for public support. These directions are mainly set in the Special Rural Support Programme,

the main instrument for agricultural and rural development policy implementation. While the national authorities formulate policy, the local authorities are involved in the RSF grant processing and payment schemes.

As well as administrative institutions, many social and economic partners (e.g. Lithuanian Chamber of Agriculture, Lithuanian Farmers Association, Lithuanian Agricultural Advisory Service, State Veterinary Service etc.) have their representatives at district level. They also play a role in the agricultural and rural development policy formulation and implementation process. However, the local institutions have not sufficient capacity to elaborate and effectively implement the development programmes.

3.1.8. National Strategy of Development of Agriculture and Rural Development

The Lithuanian National Strategy for Development of Agriculture and Rural Development was approved by the Parliament in June 2000 and replaced the National Programme for Development of Agriculture (NADP) approved in September 1993.

The NADP set the following strategic goals to:

- ensure, from national resources, full satisfying of the solvent demand of the Lithuanian population for major food products, by giving priority for production of cereals, sugar beets, oil-bearing plants and meat,
- develop the export of agricultural production,
- improve the competitiveness of agricultural production in domestic and foreign markets,
- ensure farmer's income were on parity to average income levels,
- reduce the level of unemployment in rural areas,
- promote farming practices taking environmental concerns into account, and
- revive and preserve rural cultural traditions.

The new Agriculture and Rural Development Strategy sets the goals, objectives, principles and priorities of agriculture and rural development for 2000–2006. The main aim of the strategy is to create a favourable environment for versatile economic and social rural development, nature protection and ethno-culture that would create conditions for a steady improvement in the quality of life and integration into the European Union. The goals of the Strategy are:

- competitive market-oriented agriculture based on family farms, that ensures a stable supply of high quality food products for consumers,
- development of the export of agricultural production that allows better use of existing possibilities and ensures rural employment,
- state support to agriculture based on protection of internal market and supporting the incomes of agricultural producers,
- protection of the environment, environmentally friendly farming, enhancing biodiversity and landscapes,

- possibilities to diversify economic activities in rural areas and possibilities for agricultural producers to undertake additional economic activities,
- equal economic and social rural development in accordance with regional differences,
- efficient system of agricultural science, training, consulting and education closely related to production needs.

Main directions of implementation of the Strategy are:

1. Investments into agricultural holdings, their modernisation and diversification of activities (the measures, among others, include subsidies for purchasing bloodstock and high quality seeds, support for non-traditional agricultural businesses);
2. Development of production of and markets for high quality products (includes support for organic farming development);
3. Increasing employment by stimulating alternative activities and improvement of social conditions;
4. Renovation of villages and development of infrastructure;
5. Environmental protection and improvement of the use of natural resources (funding projects to eliminate pollution sources, partial financing for the construction of manure storage places, partial funding for implementation Code of Good Agricultural Practice regarding nitrate pollution in ecologically sensitive areas, implementation of agri-environmental measures in order to protect and enhance biodiversity and land re-naturalisation, compensation of loss due to land use restrictions and application of agri-environmental measures, partial funding of projects for converting agricultural areas not suitable for agriculture, or eroded lands, into natural grasslands and afforestation).

Agriculture restructuring and modernisation measures in the Strategy, include, among others:

- Ecological agriculture (organic farming) – stimulating production of ecological produce, creating favourable conditions for the creation of markets for organic products, improvement of the organic farms' certification system;
- Forestry – preparation and implementation of programmes for afforestation of agricultural areas not suitable for agriculture or eroded lands, improvement of use of private forests, replanting of felled forests within two years

The Strategy also contains a chapter on the preservation of natural resources and biodiversity. It calls for:

- Determination of boundaries for ecologically sensitive areas;
- Decreasing the anthropogenic pressure in agricultural areas, preparation of legal documents for regulating this pressure;
- Protection of surface and ground water from pollution, decreasing the negative environmental impact of plant protection measures (herbicide, fungicides, pesticides);
- Preparation and implementation of environmental quality improvement programmes in territories affected by agricultural activities;

- Promotion of ecological, environmentally friendly farming;
- Improvement of the control of the state of forests and their use; support for construction of waste water treatment and other environmental facilities in rural areas;
- Promotion of the use of alternative and renewable energy sources.

3.1.9. Main agricultural legislation

Currently the main law concerning agriculture in Lithuania is the Law on the State Regulation of Economic Relations in Agriculture adopted in 1995. It was amended in March 2000, establishing a legal basis for the implementation of the SAPARD Rural Development plan and the basis for the development of market intervention mechanisms in line with the EC intervention systems. The functions of the Market Regulation Agency for Agriculture and Food Products have thereby been expanded (licensing of import and export of agricultural products, payments of export subsidies, monitoring and control functions).

The aim of the Law on the State Regulation of Economic Relations in Agriculture is to regulate the economic relations of agricultural subjects with state institutions and partners in agricultural market, to set the main measures for this, to create the prerequisites for implementation of the state agricultural policy and maintain the balance of the agricultural market. The Law says that Lithuanian agriculture plays a very important economic, social, environmental and ethno-cultural function, therefore it is a priority area of the national economy. The Law sets principles for state regulation in agriculture.

The Law also sets the state policy of support to agriculture. The support is given, first of all though targeted programmes, for agricultural producers, progress of agricultural science and technology, partners of agricultural markets, protection and improvement of land, soil and other natural resources, development of organic agriculture, establishment of specialised market farms, re-orientation of agricultural activities and other measures set in the Special Programme of Agriculture and Rural Development. The targeted funding is applicable to:

- support for purchasing of agricultural production by quotas and export subsidies,
- reorientation of the economic activities of agriculture in less favoured areas (LFAs),
- organisation of organic agricultural produce, elimination of concentrated pollution sources and implementation of other agri-environmental measures,
- development of co-operation and agro-services,
- support of agricultural subjects' income,
- re-orientation of agricultural activities,
- covering losses of intervention purchasing of agricultural products and foodstuff,
- improvement of processing of agriculture and fishery products,
- improvement of quality, veterinary and plant protection control structures,

- improvement and development of rural infrastructure, support for renovation of villages and preservation of the rural heritage,
- support for private storage,
- partial covering of insurance costs and losses due to unfavourable natural conditions,
- implementation of farmers' establishment and creation of production infrastructure programmes,
- compensation for income losses arising from state restrictions,
- scientific research, consultation and training,
- purchasing of productive breeding material,
- land reclamation and the liming of acid soils,
- other measures foreseen in targeted programmes.

Currently a new Law on Agriculture and Rural Development is being prepared. This will be quite a comprehensive law, covering not only the field of agriculture, but also related factors. The draft law is quite universal, and will be harmonised with many documents of international law, EU legislation, Agenda 21 etc.

The current draft of the Law on Agriculture and Rural Development, in comparison with the existing Law on the State Regulation of Economic Relations in Agriculture, introduces new definitions (rural development, agri-environmental policy, and alternative activities). This Law will set general principles for the formation and implementation of agriculture and rural development policy. Environmental protection, agri-environmental measures and organic farming appear in the strategic goals, market regulation measures and rural development goals. In addition, the current draft contains chapters on regulation of organic farming and regulation of agri-environment.

The draft is now being distributed for comments, to all relevant institutions and interest groups. Since the law is quite complicated, it is difficult to forecast the date of its approval.

3.1.10. Rural tourism

Rural tourism activities in Lithuania were introduced in 1996–1997. The Rural Tourism Association (a member of the Chamber of Agriculture) was established in 1997. The Association promotes rural tourism services, and provides technical assistance for rural dwellers willing to undertake rural tourism activities. A basic regulation of the sector – the Law on Tourism – was issued in September 1998.

At the beginning of 1999, there were 194 farmsteads involved in rural tourism business in different regions of Lithuania. The majority of the farmsteads are located in South-eastern and Western parts of Lithuania. These are the most favourable geographical regions, and are known for their rich natural and cultural resources.

During the second half of 1998, approximately 15,000 guests visited the farmsteads. Most visitors were residents of Lithuania (accounting for more than 95% of visitors). Another group of visitors came mainly from the former Soviet Union. How-

ever, rural tourism is not developed enough, and a wider range of services needs to be introduced to attract more visitors.

3.1.11. Agri-environmental policy and organic production

The first pilot program of transition to **organic agriculture** was prepared in 1987–1993. Implementation of the program was started in the north-eastern part of Lithuania (an area of 194 thousand ha), in 1993. It was operated by Tatula's Fund. In 1997 it was reorganised into the public agency "Tatulos programa". 'Tatula' was the first program officially approved and sponsored by the Government with an average annual allocation of 600,000 EUR. 50% of the funds allocated to the program are interest-free credit and subsidies for the elimination of pollutants, the other 50% is for the elimination of pollutants at certain points (e.g. processing factories). The program involves more than 100 farmers and more than 30 agricultural enterprises and partnerships. The program aims at transforming about 5% of agricultural land in the Karst region into organic agriculture by 2005–2010. Since 1997, the project in the Karst region has been spread throughout Lithuania, and state support for organic agriculture has been provided.

Support to farmers taking up organic agriculture activities was approved as a priority investment programme by the Rural Support Fund. In 1999, there were 71 farms certified and 100 transitional farms in organic agriculture, representing a total area of 3,995 ha. Certification and inspection is carried out by the public institution 'Ekoagros'. In addition to the organic farms, 5 processing enterprises, which process and market organically grown agricultural products were certified. "Ekoagros" is a member of International Federation of Organic Agriculture Movements (IFOAM) and got its accreditation in 1999.

Table 3.7. Development of organic agriculture

	1993	1994	1995	1996	1997	1998	1999
Number of farms	9	14	36	65	105	144	171
Area used for organic agriculture (ha)	148	267	582	1,118	1,614	4,006	3,995

Source: 'Ekoagros', 1999.

At present, the local market for organic products has not developed. However, it will have a high potential for export to external markets. For this, common marketing of organic products should be improved. Moreover, farmers should be encouraged to undertake organic agriculture, in order to produce a minimum mass for constant large-scale exports.

A national **agri-environmental programme** according to the EU Council Regulation 2057/1999 is in preparation. The draft Lithuanian National Agri-environmental Programme (NAEP) provides for activities, which will be taken by the Ministry of Agriculture and other institutions to ensure environmental protection against harmful activities in rural areas. The Programme is based on the current agri-environmental situation, analysis of problems and perspectives, governmental programmes and EU experience.

The main objective of the draft Agri-environmental programme is to prepare measures that ensure normal economic and social conditions for the rural population, decrease the negative impacts of agriculture on the environment, restore traditional landscapes and increase biodiversity.

The draft of NAEP consists of a description of the relationship between Lithuanian agriculture and the environment, current problems and possible solutions. The second part of the draft NAEP describes agri-environmental schemes. Agri-environmental programmes consists of three elements:

- Agri-environmental schemes (AES),
- Consultation and training,
- Demonstration projects.

AES will be applied in the whole territory of Lithuania according to the agri-environmental protection needs. Participants of the scheme who fulfil the Programme's provisions, get premium payments which cover income lost due to implementation of the provisions.

Advisory services, districts' agricultural units, together with scientific and training institutions will organise courses which explain agri-environmental schemes, agreement process, implementation of measures, sustainable agricultural methods, etc. Training and consultation for farmers participating in the programme will be free and financed from the Programme's funds.

Demonstration projects will be implemented through demonstration days on farms that are already implementing agri-environmental schemes. Some demonstration projects are already being implemented in Lithuania.

AES comprises the following measures that participants of the programme will be able to implement in their farms:

1. Fertiliser and proper manure handling;
2. Sustainable application of plant protection measures;
3. Protective belts and other technical measures;
4. Landscape protection and increase of biodiversity;
5. Preservation of historic and archaeological objects;
6. Organic agriculture;
7. Local breeds in danger of extinction;
8. Water protection, care for agricultural run-off. For implementation of this measure, sedimentation ponds have to be built on cultivated land;
9. Environmentally friendly farming. The aim of this measure is to decrease the possibility of leakage of nitrates and pesticides into layers of ground drinking water. The measure is applied in territories sensitive to ground water pollution.
10. Landscape management and enhancement of biodiversity.

It is expected that 5–10 years after implementation of NAES the run-off of nitrate from agricultural land will decrease by 30–50%, and that of phosphates by 10–20%. The establishment of more individual farms will increase the mosaic structure of the Lithuanian landscape, while smaller sizes of fields with crop rotation will decrease wind erosion. Measures related to the landscape and biodiversity protection will maintain traditional rural landscapes and enhance biodiversity in agricultural lands. Protection belts, artificial wetlands, sedimentation ponds, replacement of some drainage collectors by ditches, re-naturalisation of the ditches and other anti-erosion measures will decrease run-off of P and N to the rivers.

To evaluate the effectiveness of the agri-environmental measures and improve the programme, control of the implemented measures and monitoring of their effect on water quality, landscapes and biological diversity will be carried out.

To allow a better preparation of this national programme, a measure to be developed at the pilot level is included in the present SAPARD plan. It is planned to begin the implementation of this measure in 2002, after agreement with the European Commission.

The **Code of Good Agricultural Practice** has been approved by the decision of the International projects' for environment and agriculture monitoring committee on the 19 of July 2000. The minimum national standards regarding environment, veterinary, hygiene and animal welfare are the green values of this code. The Code consists of obligatory and recommended rules. The main rules and recommendations for good farming given in this publication are seeking that a farmer who follows them would not only improve the environment, but also would achieve a profit that provides sufficiently good living conditions. The CGAP includes rules relating to:

1. Periods when the application of certain types of fertiliser is prohibited;
2. Livestock densities corresponding to manure application – maximally 170 kg of nitrogen per year per hectare of utilised agricultural area;
3. The capacity of storage vessels for livestock manure for a storage period of 6 months;
4. Limitations on the application of fertilisers to the land, consistent with good agricultural practice and taking into account:
   - soil conditions, soil type and slope;
   - climatic conditions and rainfall;
   - land use and agricultural practices, including crop rotation systems and a balance between:
     - the foreseeable nitrogen requirements of the crops, and
     - the nitrogen supply to the crops from the soil and from fertilisation corresponding to:
       - the amount of nitrogen present in the soil at the moment when the crop starts to use it to a significant degree (outstanding amounts at the end of winter),
       - the supply of nitrogen through the net mineralisation of the reserves of organic nitrogen in the soil,
       - additions of nitrogen compounds from livestock manure,

    - additions of nitrogen compounds from mineral fertilisers.

5. Ratio between perennial and annual crops;
6. Increase of vegetation cover during periods when the soil is most vulnerable to nitrate leaching;
7. Measures that do not allow agricultural effluents to pollute surface and ground water;
8. Land reclamation, biological diversity and landscape.

The discussion on designation of vulnerable zones is in process. The designation will lead to the preparation and implementation of action programmes for vulnerable zones and training programmes for farmers.

3.1.12. Afforestation of abandoned agricultural land

Afforestation of the abandoned agricultural land is being considered as an opportunity, as it will take place in any case: either by plantation or by natural vegetation succession. At present, the legal basis for land-use planning for the designation of areas suitable for afforestation are:

- The decision of the Government concerning the approval of the "Procedure for Afforestation on Private Land" adopted on April 9th 1998, No 425; and
- The "The Regulation on Development of Forest Land Management Scheme" approved by the Minister of Agriculture and by the Minister of Environment April 7th 1999.

The overall legal framework for the planning is the Law of Territorial Planning.

In these present regulations, designation of areas suitable for afforestation is based on several criteria:

- Unused land – including non-agricultural lands suitable for afforestation (sand and gravel soils, eroded slopes, ravines etc.);
- Agricultural land with soil fertility lower than 27 (if on drained land, only when it is certified that the drainage system is damaged and is not to be reconstructed);
- Land with soil fertility 28–31 provided they are not convenient for mechanised land cultivation;
- Agricultural land between forests and water bodies.

3.1.13. The EU accession process

Since the restoration of independence the political and economical orientation of Lithuania has been linked with Europe. Lithuania, as well as the other Central and Eastern European countries, has chosen the path of integration into the European Union. On 18 July 1994 a Free Trade Agreement with the EU was signed, the Europe (Association) Agreement of 12 June 1995 has laid the legitimate, economic and social foundation for further integration into EU. On the 8 of December 1995 Lithuania submitted a formal application for EU membership.

The main criterion for EU membership is approximation of the Lithuanian legal framework with EU law. By establishing new regulations for the agriculture and food processing industry, trying to create competitive markets which resemble West and Central European national economies, Lithuania has started the transition programme in the agricultural and food processing sectors.

To achieve the effective implementation of these goals during the transition period the Agri-Food Euro Integration Department under the Ministry of Agriculture was established according to the decision No 1303 of the Lithuanian Government.

At the Helsinki Summit in 1999, an invitation to start the negotiations on accession to the European Union (EU) opened a new stage of the integration process for Lithuania. A lot of work has been done since December 1995, when Lithuania submitted its formal application for membership to the EU. In the main strategic documents, such as National *Acquis* Adoption Plan and Institution Development Plan, Lithuania has a clear vision of a way it will transpose the Common Agricultural Policy (CAP) elements during the pre-accession period. At the same time, we have to recognise that transforming agriculture and agro-processing industries towards EU food quality and safety requirements and structural changes is a very difficult and costly process. Lithuania has set itself an ambitious goal to be ready for the EU membership by the 1 of January 2004. The negotiations with the EU on different chapters that started in March 2000, and their intensity, imply that they will be finalised in time. The Negotiation Position Paper on the agricultural chapter was presented to the Negotiation Conference in December 2000. As negotiations on this chapter are highly complicated and require special preparation, according to the time schedule ("Road Map") presented in the Nice Summit, it is obvious that the agricultural chapter will be opened during the Swedish presidency and real negotiations will start at the end of 2001.

Lithuania fully accepts, and will be ready and capable to implement, the EU *acquis* in the agricultural chapter from the date of accession to the European Union. Since some harmonisation and implementation of the EU *acquis* concerning agriculture will take longer than until the 1 of January 2004, a few transitional periods and technical adjustments are requested by Lithuania.

One of the major challenges that the Lithuanian food industry faces in the process of its integration into the EU is the enhancement of competitiveness and readiness to operate in the EU single market.

With Lithuanian membership of the EU (when all border protection measures are lifted), the focus will be switched to develop and secure the capacity of local food products to cope with the competitive pressure from the current EU Member States, as well as from the Central and Eastern European Countries. The success of this process will largely depend on the readiness to apply the EU *acquis* requirements throughout the food marketing chain.

In order to achieve the above-mentioned goals, it is necessary to carry out modernisation and restructuring of primary agricultural production, to upstream and downstream industries as well as to enhance the efficiency throughout the marketing chain and to improve both food quality and product safety. The privatisation of the food industry, which is being finalised, provides a solid basis for the implementation of the above-mentioned measures.

Recently Lithuania and the EU have taken steps to extend access to their markets for agricultural products by a new agreement on further trade liberalisation. Trade negotiations between the European Commission and Lithuania on new reciprocal agricultural concessions, which were undertaken on the basis of Article 20(4) of the European Agreement and were carried out in the overall context of the pre-accession process, were concluded in June 2000.

The results of these negotiations provide for an unlimited free access to both the EU and Lithuanian markets for the so called least-sensitive agricultural products.

An agreement is also achieved on a "double zero" list which includes such products as pig meat, poultry, sausages, cheese, eggs, tomatoes and apples. The "double zero" approach provides for the reciprocal elimination of import duties within tariff quotas and the elimination of export refunds for these products. The amounts of tariff quotas, compared to those applied previously, have been increased, especially, in the cheese sector. The Lithuanian cheese export quota has been increased more than 3 times (from 1,750 t to 6,000 t).

In addition, Lithuania has been unilaterally granted duty-free tariff quotas on imports of some products such as milk powder and butter to the EU. The agreed tariff-free quotas will be increased by 10% each year.

3.1.14. SAPARD and strengthening of the absorption capacity to utilise the EU Funds

With the aim of enhancing agricultural and rural development in the candidate countries, the EU has taken measures to provide a special pre-accession aid (SAPARD), thus, creating favourable opportunities for these countries both to acquire in-depth knowledge of the policy design and implementation procedures within the EU framework and to become involved in the EU-initiated and co-financed programmes.

SAPARD will be implemented according to the National Rural Development Programme that was approved on the 27 of November 2000 by the European Commission Decision No 3329. In accordance with agricultural and rural development policy trends, the National Rural Development Programme sets a range of priorities:

- Investment in agricultural holdings;
- Improving the processing and marketing of agricultural and fishery products;
- Development and diversification of economic activities providing for multiple activities and alternative income;
- Improvement of rural infrastructure;
- Afforestation of agricultural land and improvement of forest infrastructure;
- Environmentally friendly agricultural methods;
- Vocational training;
- Technical assistance, information and public campaigns.

The Financial Summary is as follows:

Total public expenditure:	277.610 million EUR (51.6%)
of which	
National public funding:	69.403 million EUR
EU contribution:	208.207 million EUR
Private Funds:	260.040 million EUR (48.4%)
Total eligible cost:	537.650 million EUR (100%)

(see Appendix, Table 3)

With a view to ensuring proper SAPARD management and effective utilisation of Structural Funds, Lithuania has expanded its administrative capacities both at the national and regional levels. The Governmental Resolution (11 November 1999) sets up the National Paying Agency under the Ministry of Agriculture which acts as the SAPARD Agency and is designated to manage all national support funds and funds provided under SAPARD. At the regional level Rural Development Programme Departments (10 offices) have been established delegating part of the support and administration service functions to them (i.e. collection of applications and spot-checks).

A lot of preparations have been made in Lithuania for administration of SAPARD. The operational structure of the Agency is in place, necessary staff (50 civil servants in the central headquarters and about 60 at the regional level) recruited and trained, and job descriptions and manuals are prepared. In the near future it is intended to expand the functions of the National Paying Agency in order to be fully prepared for administration of means from the European Agriculture Guarantee and Guidance Fund from the date of the accession to the EU.

In order to increase the absorption capacities, a range of different measures have been taken such as a SAPARD publicity campaign (seminars, training courses, publications), elaboration and presentation of working documentation which will facilitate filling in application forms and preparation of business plans, as well as statistical surveys to identify the demand for such support.

3.1.15. Agriculture and Rural Development Plan 2000–2006

The Lithuanian Agriculture and Rural Development Plan 2000–2006 has been drafted in accordance with the programming requirements of Council Regulation (EC) No 1268/1999 and Commission Regulation (EC) No 2759/1999.

The Plan has been prepared by the Lithuanian Ministry of Agriculture (MoA) in close co-operation with the Commission and relevant competent authorities and co-ordinated with economic and social partners. The MoA is responsible for the drafting and implementation of the RDP.

The Plan presents the objectives and instruments for Lithuanian agricultural and rural development in order to qualify for SAPARD assistance. The Plan is based on the Programme of the Government of Lithuania, the Lithuanian Agricultural Strategy, the Preliminary National Development Plan and the National Agri-Environmental Programme. The aid measures are in conformity with the obligations assumed in the accession partnership and are in line with the National Programme

for adoption of the *Acquis*. In addition, the measures are consistent with the objectives of the EU Common Agricultural Policy.

RDP General Objectives:

- Provision of additional income for farmers and rural dwellers as well as increased income levels leading to improved living standards and working conditions in rural areas;
- Improved competitiveness and efficiency of primary agricultural production;
- Improved processing and marketing of agricultural produce through increased efficiency and competitiveness;
- Improved quality and hygiene standards;
- Achieving a sustainable rural development through promotion of farming and other economic activities in harmony with the environment;
- Creation of employment opportunities in rural areas.

RDP Strategy

The strategy to achieve the general objectives presented in the plan is presented as follows:

- Improving structures in the area of primary agricultural production, modernising farms and introducing new efficient farming technologies, and promoting efficient, competitive, quality and marketable output at all levels of the agri-food chain;
- Building a competitive agri-food industry and targeting investments towards sector restructuring, development of higher value added products, fulfilment of hygiene, food safety and quality standards, creation of employment opportunities, introduction of environmentally friendly technologies;
- Supporting the achievements of the highest environmental standards in all programmes which promote agriculture, food, rural development and forestry;
- Promoting the production of non-surplus products as well as encouraging alternative income creating rural enterprises, both on and off-farm;
- Ensuring availability of appropriate human resources, advice and support to meet the economic, social and development needs of farmers and rural communities in general; and sustaining and exploiting the cultural, historical and natural heritage of the countryside.

Forestry and environment measures are described below, as these measures are the most appropriate for the topic of this paper.

Forestry development and afforestation are alternative uses for agricultural land. Furthermore, forestry is in itself an important economic activity in rural areas. Afforestation is able to provide new long-term employment opportunities in rural areas. To a large extent, the forestry sector plays an 'alternative to agriculture' role. However, private forestry is underdeveloped, mainly due to unfinished land reforms. For that reason, it was decided to include actions related to forestry in a specific measure on forestry.

The measure is focused on the development of the economic, environmental and social functions of forests in rural areas with a particular emphasis on afforestation of abandoned agricultural land and improvement of forest infrastructure. Increased afforestation of abandoned agricultural land is considered an important activity to reduce dependency on agriculture and to improve environmental conditions in rural areas. This will positively influence landscape diversity and stability. In a broader international perspective, a modification of land-use towards an increased share of land with a more permanent plant cover, will contribute positively to present policies on climate change through carbon sequestration, and by promoting sustainable forest management; biodiversity can also be positively affected.

The targets at the end of the programme period are as follows:

Area afforested:	9,000 ha
New jobs:	4,500 jobs

It is expected to allocate approximately 6 percentage of total public support in the RDP to this measure leading to the implementation of more than 1,500 projects.

The main objective of agri-environmental measure is to decrease the negative impacts of agriculture on the environment, restore traditional landscapes and increase biodiversity and to prepare measures that ensure normal economic and social conditions for rural populations. The measure will be applicable in two pilot areas. One pilot area was chosen in an intensive agriculture area. The specific pilot area selected is Rusnė Island, the biggest island in the Nemunas river delta.

The general agri-environmental sub-measures, which could be applicable in both pilot areas, are:

- Fertilising and proper manure handling;
- Protective belts and other technical measures;
- Landscape protection and increase of biodiversity;
- Preservation of historic and archaeological objects;
- Preserving domestic animal breeds in danger of extinction;
- Organic agriculture.

Strategic actions under this measure will be:

- Premium per ha where agri-environmental measures are applicable;
- Premium for local animal breeds in danger of extinction.

Taking into account the complexity of the measure and its nature as a pilot action, all the further required details of this measure will be defined and this measure will be implemented, provided that consultation and agreement with Commission is reached.

The total eligible financial cost for the implementation of the present Plan (year 2000–2006) is estimated at 537.650 million EUR. The total financial allocation out of the EU contribution, is 208.207 million EUR.

3.2. Biodiversity

3.2.1. Present situation in biodiversity

Natural and semi-natural ecosystems in Lithuania (forests, wetlands, meadows, water bodies and sand) take up 1/3 of the territory. Species densities in these ecosystems is very varied. Most species live and grow in the forests. Lithuania belongs to the natural zone of mixed forests. Plant types of the zone are broad-leaved-coniferous forests. There are three biogeographic units in Lithuania: Eastern Baltic, Central European and the Aquatic province of the Baltic Sea.

The Lithuanian flora includes 1,796 plant species (see Table 3.8). *Compositae* (124 species), *Poaceae* (117 species), *Cyperaceae* (93 species) families are among the largest. Depending upon life forms, species have the following distribution: trees – 20 species, bushes – 57 species, shrubs and semi-shrubs – 23 species, herbal plants – 1,266 species.

Table 3.8. The number of plant species in Lithuania

Systematic categories	Number of known species
Flowering plants (*Anthophyta)*	1,328
Coniferous plants *(Coniferophyta)*	3
Club moss (*Lycophyta)*	7
Horse tails (*Sphenophyta*)	8
Ferns (*Pterophyta*)	21
Mosses *(Musci)*	320
Lychenised mosses *(Hepaticae)*	106
Horn-flowered mosses *(Anthocerotae)*	3
Total	1,796

Intensive economic activities cause irrevocable changes in vegetation: simplification of communities' structure and species composition, physionomic and dynamic changes, and synanthropisation that is a particular threat to the cenofund. During 45 years 327 new species penetrated into the Lithuanian flora (at present as many as 82 out of 427 invasive species have become naturalised in plant communities, particularly in sand communities).

The observed reduction of the area of all natural ecosystems results in the instability of the communities, causes changes in their structure and species composition: cosmopolitan and widespread species start predominating, and finally ousting, species typical of separate ecosystems. This is first of all observed in meadows and wetlands (particularly low marsh) and on sandy soils.

The existence of wetland vegetation is seriously threatened by intensive land reclamation. Vast areas of wetlands suffer from eutrophication that causes adverse changes in vegetation. Stagnation is observed in communities of raised bogs: reduction in growth rate, reduced biological increment. With mineralisation, meadow and forest species atypical of wetlands start appearing in all wetlands.

The transformation of meadow ecotopes into farmland has resulted in almost total destruction of the continental meadows. Only fragments have survived between arable fields, near forests, and on hill slopes. Today meadow vegetation is represented only by the flooded meadows in river valleys and near lakes. Species and taxonomic composition changes are observed, species of wide ecological amplitude are becoming widespread. In most meadows, productive *Alopecuretum pratensis* communities are replaced by the *Deschampsietum caespitosae* communities that are of low value, adventives *Bunias orientalis* and other species penetrate the communities, sedge (*Caricetum*) growths after land reclamation are replaced by low-value grasses (e.g. the expansion of *Ranunculus repens* in the lower reaches of the Nemunas River). Particularly threatened are rare communities and those that occur at the limits of the area. *Iridetum sibirici* and *Cirsietum rivularis* are diminishing in area. Unbalanced use of fertilisers and soil acidification have resulted in a reduction and total extinction of populations of the orchid (*Orchidaceae*) family species.

Sand vegetation has been adversely affected by afforestation. Thickets of mountain pines (*Pinus mugo*), which are typically planted in the sandy coastal soils, are ousting the following rare and endemic species characteristic of the eastern coast of the Baltic Sea: *Festuca sabulosa, Tragopogon heterospermus, Linaria loeselii, Corispermum intermedium*. Forests are intensively planted on the south-eastern continental sandy plains, namely, *Pinus silvestris*. Due to these forests growing, rare species characteristic of the region and those occurring at the boundaries, becomes extinct: *Armeria elongata, Spergula vernalis, Teesdalia nudicaulis, Bromus commutatus, Silene lithuanica*.

Aquatic vegetation changes under the impact of economic activities – the natural vegetation in most of the small water bodies was destroyed by land drainage; plants perish at the points of industrial waste water discharge; in areas under intensive farming aquatic vegetation is thriving and its growth rate has considerably increased. Fast overgrowth of water bodies during which quantitative and qualitative changes take place in aquatic vegetation are among most outstanding effects of anthropogenic eutrophication.

In totally overgrown eutrophiced water bodies the progressive decline of species diversity begins unavoidably, and species and communities of wide ecological amplitude take root. For example, in the Žuvintas Lake alone, during a period of 30 years 14 stonewort algae, 9 flowering plants and 1 moss species have become extinct. During nearly the same period of time, *Nyphoides peltata* has become extinct in all habitats in rivers in the western part of the country (Jūra, Minija, Gėgė); its only definitely know remaining habitat is the Kniaupas Bay of the Curonian Lagoon.

Sub-aquatic plant species are the first to decline – they are most sensitive to water quality, transparency, bottom sediment changes. The most rare plants of our flora – *Myriophyllum alterniflorum, Lobelia dortmanna, Isoetes lacustris, Najas minor, Lychnothamnus barbatus, Nitella spp* – belong to this group of plants.

Another obvious tendency in the development of aquatic vegetation is the prevalence of large over-water halophytes, such as *Phragmites australis, Schoenoplectus lacustris, Sparganium erectum* etc. in lake shallows up to 2 m deep and in shallow river beds. For this reason, small species which are typical of sand and gravel bottom soils of lake shallows are declining in lakes, and in rivers the same holds true

for sub-aquatic reophilic pondweeds and aquatic ranunculaceous plant species and communities.

Most wildlife in Lithuania is associated with broad-leaf deciduous/coniferous forest and southern taiga. These two biomes encompass a variety of habitats (forest, meadow, aquatic, agricultural and urban). Although the largest wildlife biomass is found in deciduous and mixed forest, the highest species diversity occurs in ecotonal areas, such as where forests and wetlands meet. Even in comparatively well studied groups, species new to Lithuania are being found. Taxa which are insufficiently studied in Lithuania, and which may yield new insights into Lithuanian biodiversity, are amphibians, reptiles, bats, small predators, insectivores and rodents.

There are some 500 vertebrate and 20,000 invertebrate species in Lithuania (Table 3.9.), most of the smaller of which, particularly protozoa, insects, helminths, sponges, coelenterate and bryozoa, have been insufficiently studied.

Table 3.9. Estimated numbers of fauna species in Lithuania

Taxa	Estimated number of species
Mammals (*Mammalia*)	70
Birds (*Aves*)	321
Reptiles (*Reptilia*)	7
Amphibia (*Amphibia*)	13
Fishes (*Pisces*)	96
Cyclostomata	3
Insects (*Insecta*):	~15,000
Dragon-flies (*Odonata*)	57
Hymenoptera (ns):	
Braconidae	~200
Ichneumonidae	~450
digger wasps	145
Diptera	~2,000
Lepidoptera:	2,217
butterflys	1,200
Microlepidoptera	1,017
Beetles	1,800-2,200
Ants	>40
Arachnida	~200
Mollusca	~170
Rotatoria	300
Porifera	6

Trends in the changes in wildlife species are primarily determined by the impacts of changes in the structure and patterns of ecosystems and by human activity. It is supposed that previous excessive use of chemicals has considerably reduced the number and diversity of bats via the food chain, the same holds true for the hare.

Out of 213 bird species nesting in Lithuania, 53 are decreasing in population. Land reclamation had the most dramatic impact upon birds. With changed conditions in

the areas drained, the number of birds nesting in shrub thickets and meadows reduced by 90%, that of shrubbery and forest birds by 70% and 40% respectively. Economic activities of the forest sector have an adverse effect primarily upon the large birds and birds of prey, black storks (*Ciconia nigra*), *Gallinaceae*, and woodpeckers. Environments intensively altered by human activities have also had an adverse impact upon migrating birds, as their stop-over and feeding grounds change or are totally destroyed.

Land reclamation and application of chemicals have caused a reduction in the numbers and diversity of amphibians in open biotopes, however, the situation is currently improving. The vast mono-culture fields are currently being replaced by a mosaic of farming lands which offer more favourable living and wintering conditions, and less mineral fertilisers and chemicals (herbicides and pesticides) are being applied.

3.2.2. Impact of agriculture and other economic activities on ecosystems

Wetlands/forest/meadow ecotones are of particular importance to animals. The biological diversity of invertebrates and other animals observed in these transitory areas is the highest. The mosaic of ecosystems in Lithuania is a result of centuaries--long economic activities. A natural trend in the ecosystem changes is the successional growth of forests over open areas, with a decrease in the diversity of ecosystems. The anthropogenic change in the ecosystems' mosaic is highly dependent upon the social and economic conditions. With the collapse of the soviet "kolkhoz" system, vast stretches of land were split into plots, and the ecological mosaic increased. During the first stage of the decline in the agricultural sector there was an increase in the area of extensively used meadows and pastures; later on they grew over with shrubs and forest. Anthropogenic increase in afforestation primarily occurs at the expense of coniferous trees, which does not favour biological diversity.

Agrarian ecosystems occupy the largest area (53.7%) in Lithuania and are very impoverished from the biodiversity point of view. They are all particularly insufficiently studied: only some of their functional aspects are known. Of late, with land privatisation and less intense agriculture, with an increase in the areas' disintegration and their diversity, with a certain part of previously cultivated lands lying fallow and becoming overgrown with meadows and shrubs, with a reduced or virtually no use of mineral fertilisers and chemicals as well as with the disappearance of consequences of land reclamation, the ecosystems of the agrarian environment are becoming suitable for an increasing number of plant, fungi and animal species. It is believed that in the near future conditions in this ecosystem will not deteriorate.

Natural **meadows ecosystems**, particularly in forests and river valleys, typically boast the richest diversity of plants and related invertebrates and fungi. Unfortunately, during the last 30 years the area of natural meadows has decreased: in 1956 meadows covered 19.6% of the country's territory, whereas in 1980 they accounted for only 6.5%. Particularly reduced in numbers are natural continental meadows that were intensely cultivated or planted with forests. The diversity of meadow communities is high. They belong to 5 classes: saline (*Asteretea tripolii*), steppe

(*Festuco-Brometea*), fertile (*Molinio-Arrhenatheretea*), barren (*Nardetea*), forest meadows on slopes (*Trifolio-Geranietea sanguinei*) and belong to 45 associations. Communities of fertile (*Molinio-Arrhenatheretea*) meadows prevail and steppe (*Festuco--Brometea*) meadow communities reach the northern limits of the distribution area.

The status of the surviving natural flooded and continental meadows is bad and is still deteriorating. Preservation of semi-natural meadows depends on their extensive use; unfortunately however, no legal economic compensatory mechanism has been created to support extensive agriculture in these habitats. Economically strong farms tend towards over-intensive use of fertile meadows (as pastures), which then degrade. In other cases, given the general decline in agriculture, poorly-fertile meadows and pastures which are no longer used, grow over with shrubs or else forests are planted there. In some regions, particularly in Žemaitija, abandoned arable lands are turning into meadows.

In Lithuania, the following processes in relation to ecosystems are probable:

- further distribution of early stage land communities and a reduction in the area of climax communities with a loss of certain successional stages,
- loss of biological diversity in eutrophic wetlands and lakes, with mono-dominant communities gradually prevailing,
- a decrease of species and community diversity in the forest ecosystem due to intense forestry, with mature deciduous forests being mostly affected,
- a decrease of meadow communities and species due to shrub succession, or due to the transformation of meadows into cultivated land,
- biological diversity increases in agro-ecosystems due to an increasing fragmented and mosaic character of land plots, also thanks to a reduced use of fertilisers and chemicals as well as increasing areas of long rotation fallow lands,
- stabilisation of the trophic state of lakes and water reservoirs, with changes in communities' structure as well as of hydrobionts' biological diversity thanks to a slow-down in the processes of anthropogenic eutrophication,
- deterioration of water quality in rivers, changes in communities' structure and a reduction in biological diversity due to the development of hydropower and water transport systems as well as due to the on-going anthropogenic eutrophication,
- a recovery of the ecosystem of northern areas of the hypertrophic Curonian Lagoon into a eutrophic state thanks to a reduction of anthropogenic eutrophication processes. However, further successions of communities are probable due to the envisaged destruction of the natural barrier between the Lagoon and the sea (Klaipėda Sea-port will be developed southwards and the channel is going to be deepened) which will allow a saline water influx into the northern part of the Curonian Lagoon,
- reduced biological diversity in the coastal waters of the Baltic Sea due to the development of maritime-industry as well as changes in the marine landscape in the regions of dumping.

3.2.3. Protection of biodiversity

The status of biological diversity and biological resources in Lithuania is mainly influenced by the following processes:

- essential changes in the geoecological conditions due to land drainage in the Soviet period,
- intensive forest felling, destruction of small forests which are of particular importance to the biological and landscape diversity, all this resulting from the process of privatisation,
- damage of forest ecosystems as a result of natural disasters (droughts, pests etc.) and pollution,
- destruction of the biological diversity of ligneous plants as a result of the use of selected tree species,
- changes in the ecological conditions of meadows due to a decline of economic activities there,
- intense use of chemicals in farming in the protection belts and zones near rivers and lakes,
- increasingly irrational use of water bodies after their privatisation or lease,
- reversion of rivers and rivulets into ponds thus violating the thermal regime of hydro systems and destroying migration routes,
- intensification of illegal overall fishing in natural inland waters, increase of fisheries, inefficient stock-taking, collapse of the fish breeding system,
- poor control of vessels, with the holds of vessels being washing into the sea and increasing Baltic Sea pollution with oil products,
- pollution of the sea with industrial and municipal waste waters,
- formation of increased constant pollution zones in the natural environment of inland waters and intensification of successional processes in them,
- uncontrolled growth of recreation activities in the rural environment,
- destruction and decrease of islands of natural landscape in urbanised environments,
- development of road networks, their load intensification, and soaring numbers of motor vehicles,
- misuse of the hunted fauna resources, with violations of fauna breeding laws, increases in illegal hunting and lack of control and registration data.

The issues of the survival of natural continental meadows and calcarious low marshes has become acute; most of the natural flooded and continental meadows have been destroyed. A particularly intensive destruction of the latter took place in Šilutė District where about 75% of wetlands, 30,000 ha of the lower reaches of Nemunas River and 10,000 ha of the flooded meadows of the lower reaches of the Minija were drained and their former economic value was lost.

There is a continuous process of lake eutrophication; under the impact of the nuclear power plant the vegetation of the Drūkšiai Lake and its environs is changing. The number of affected trees (defoliation) in the immediate neighbourhood to

the nuclear power plant is ever increasing, waste land areas are increasing with ruderal and synanthropic species, communities composition is being reduced.

Allocation of new wetlands areas for peat extraction would have an inevitable adverse effect upon Lithuania's biological diversity. The envisaged construction of new ports, reconstruction and new construction of oil terminals, construction of major highways for transit, location of new soil dumping sites in the sea without taking the necessary precautionary measures would also adversely affect the biological diversity status in these areas.

The likelihood that these processes will occur is preconditioned by a low environmental awareness of the general public, and by anti-ecological approaches at both Government and municipal levels, as well as by the deletion of ecology criteria from landscape management practices. Therefore, it has become "a norm" that there is insufficient consolidation of the 'special land and forest use conditions' in land title documents, as well as their disregard in practice; this seriously weakens the legal regulation of protected areas, a problem made even worse by lack of enforcement.

Basic negative factors for biological diversity protection are:

- lack of ecology advocacy and awareness,
- absence of a vision of a biological diversity protection system,
- frequent changes in the process of land reform,
- lack of legal acts for the regulation of land use and absence of biological assessment,
- lack of funds for environment protection, both organisational and practical measures,
- lack of separate biological diversity component studies,
- lack of land planning documents, delays in the development of land management plans for the Republic of Lithuania, administrative regions and municipalities, and a manifestation of the official tendency to turn them into "national economy development plans",
- lack of restoration programmes for damaged nature complexes, slow progress in forest planting and recultivation activities,
- lack of land planning, professional designers and botanists and zoologists experienced in special land planning,
- fragmentation of protected areas administration under different jurisdictions,
- prevailing rapacious utilitarian attitudes among the public about nature and natural areas,
- underestimation of the importance of university and academic education, lack of understanding of the significance of applied natural sciences research for a rational development of the economy,
- absence of a country – wide biological diversity study, insufficient motivation of territorial biological protection,
- insufficient development of biogeography and lack of ecosystems studies,
- lack of specialists.

Favourable factors for the conservation of biological diversity:

- collapse of the former irrational uniform agriculture system, implementation of a State pilot programme (Tatula) in the Karst region by focusing upon sustainable farming and sustainable bio-organic land cultivation,
- reduction of the scale and tempo of land reclamation,
- reduction of both industrial production volumes and pollution,
- elimination of the former Soviet military training grounds,
- National Environmental Strategy development and approval,
- inherited biology science system and the country's accumulated research fund,
- international agreements and aid for the preservation of biological diversity,
- the fast developing activities of non-governmental organisations (NGOs),
- State and institutional environmental programmes ("Nuclear Energy and Environment", EKOSLIT etc.).

In order to protect species and communities, the Lithuanian Red Data Book has been compiled and protected areas have been established.

The Institute of Agriculture of Lithuania has is established a modern plant seed storage facility. There are 25 collections of species of agricultural plants which are examined and maintained there; there are about 4,000 samples in these collections. In 25 garden plant species collections in the Gardening and Farming Institute of Lithuania there are 2,000 samples. The collections of agricultural plants are also conserved at the University of Agriculture of Lithuania. Genetic resources of plants include only those plant species, sorts, lines, hybrids and forms that are used by man. The priority should be attributed to the plants of local origin that are especially important to human needs, such as plants used for food, fodder, technical, medical and decorative purposes.

The protection of the gene pool of domestic and cultural biota is a very important problem, and preservation of the following **domestic species** is considered to be a priority:

- Carps of Lithuanian (Bubiai), a breed originating from Galicia carps introduced in XVII–XVIII century;
- "Žemaitukai" horse breed (containing tarpan blood);
- Lithuanian blackhead sheep, Lithuanian hounds;
- Other animals and birds of Lithuanian breed;
- Lithuanian varieties of crops, vegetables, fruits and flowers.

With the aim of developing Lithuanian **economic sectors**, strategies, programmes and plans have either been developed or are under way. First of all this refers to the development of forestry, agriculture, transport, tourism development etc. So far in all these documents too little attention has been given to the preservation of biological diversity. The Lithuanian Forestry and Timber Industry Development Programme declares the importance of the preservation of biological diversity in forests. It provides for the creation of a separate programme for the preservation of genetic diversity in forests. However, there is no integrated approach to the forest

as a system comprising various levels (geo, eco, species). Such an approach should be formed in all sectors related to forest protection and use.

In order to decrease the negative impact of agriculture on biodiversity in the future, an agri-environmental programme for Lithuania is under preparation that has to be approved by the Government. This programme will be tested in the pilot area – Rusnė island in the Nemunas delta. The draft national Agri-environmental programme, and especially the pilot agri-environmental scheme for Rusnė island, would make it possible to balance out all the important problems of biological diversity of agricultural and urbanised landscapes

The Programme for the Mastering and Use of the Mineral Resources which outlines the use of mineral resources does not even touch upon the preservation of biological diversity.

3.2.4. Protected areas

The system of protected areas of the Republic of Lithuania is aimed at the conservation of: nature and culture heritage complexes and objects, landscape ecological balance, biological diversity and gene pool; at the restoration of natural resources. Also, it creates conditions for the development of cognitive tourism (eco-tourism), research and observations of environmental status, for the promotion of cultural heritage protection. Pursuant to the Law on Protected Areas, the system of Lithuania's protected areas consists of:

- conservation areas – strict nature or culture reserves, protected landscape objects (natural monuments), reserves of different kind,
- preservation areas – protective zones for various purposes,
- recuperation areas – sites where resources are protected or restored,
- integration areas – national and regional parks as well as biosphere monitoring areas.

The main attention is given to Category 1 and 4 protected areas that are given a general name of Specially Protected Areas. In Lithuania they cover 728,042 ha or 11.1% of the country's area. In 1997 there were 1,113 protected sites listed in total, including 4 national parks and 30 regional parks. Most of the protected areas are concentrated in the Southeast Lithuanian regions.

Table 3.10. Protected areas, at the end of 1997

	Number	Area (1000 ha)	Share of total area %
Integrated areas:			
National parks (IUCN II)	5	138.1	2.1
Regional parks (IUCN V)	30	380.9	5.8
Conservation areas:			
Strict nature reserves	4	23.5	0.3
Strict culture reserves	2	0.2	0.1
Reserves (IUCN IV)	290	176.4	2.7
Landscape objects	688	-	-
Total of above listed data	1113	734.0	11.2

Strict nature reserves are aimed at the preservation of typical or unique landscape complexes as well as their genetic resources. Economic activities are prohibited there.

Reserves are set up with the aim of preserving complexes of natural and cultural heritage or their separate elements, plant and animal species. Reserves are divided into types: landscape, botanical, zoological, geomorphologic, hydrographic etc. Economic activities of potentially adverse impact upon protected complexes are limited or prohibited depending upon the character of protected complexes.

Protected landscape objects (nature monuments) are declared with the aim of preserving unique nature objects: trees, habitats of rare plant and fungi species, unique and declining plant communities, unique boulders, hills of exceptional size and shape, ridges etc.

National and regional parks are set up with the aim of preserving landscape objects which are valuable from the nature and culture points of view, maintaining the stability of ecosystems, to restore destroyed or damaged nature and culture complexes, to organise cognitive tourism, etc. Depending upon the character of protected complexes and objects as well as their use, the following functional zones are singled out: conservational (strict nature reserves and managed nature reserves), protective, recreational, economic and redidential. Economic activities are limited or prohibited depending upon the character of a zone.

Most protected areas important for the conservation of biological diversity are in Eastern Lithuania. There are plenty of them in highland, sand plains. In 1993, five territories were given the Ramsar territory status. The Nature framework in Lithuania connects all natural protected areas and other ecologically important and rather natural territories into a system of landscape conservation and ecological compensation zones.

Protected areas represent environmentally sensitive areas as well as two other regions: *Nemunas Delta* region and *North Lithuania Karst* region. The first region covers up to 52.4 thousand ha, and the second one – 193.5 thousand ha. Both regions are sensitive to intensive agriculture. In the Rural Support Fund, organic farming programmes for these environmentally sensitive areas were designed.

Processes which have major impacts upon environmental status in protected areas are:

- lack of inventories of the components of the biota (or only very incomplete ones),
- lack of planning documents,
- forest use and replanting which disregards the requirements of biological diversity conservation,
- former land drainage,
- absence of regulations for biological diversity preservation while performing economic activities,
- invasion of construction in relation with land privatisation,
- poor administration and insufficient responsibility, or its absence,
- lack of interest from the local population in protecting biodiversity,

- lack of education and information.

All this poses a true threat to the values of most of the protected areas as they promote degradation of the natural landscape and, primarily, the degradation of biota. These negative factors are mainly manifest in regional parks, for which no management programmes have been developed, with administrations set up only a few month ago, as well as in reserves which today are insufficiently controlled. The overall environmental status in Lithuania's protected areas could be assessed as being generally satisfactory; however, in some instances it is obviously poor.

3.2.5. Institutions/organisations involved in biodiversity protection

There currently are more than thirty laws either directly or indirectly regulating the use of environmental protection and natural, i.e. biological resources. The Lithuanian Ministry of Environment with its regional structures is responsible for the conservation of biological diversity in Lithuania. The Ministry of Agriculture, which regulates economic land use, and self-governing institutions, are connected with protection of biological diversity.

One of the main tasks of the Ministry of Environment is the preservation of characteristic Lithuanian landscapes, natural ecosystems, nature values and biological diversity. Preservation of forest ecosystems, biological and landscape diversity in forests, improvement of the protective properties of forests are also among the tasks of the Ministry of Environment (Department of Forestry and Protected Areas). In this sphere the Ministry:

- drafts laws and other legal acts on the protection of biological diversity and resources,
- develops and approves rules, norms and standards for the use of biological resources,
- arranges activities for planning in protected areas,
- creates programmes of environmental measures for the preservation of biological diversity,
- assigns limits and conditions for the use of biological resources,
- regulates and controls the register of natural resources,
- arranges for the compilation and maintaining of protected areas, plant and wildlife cadasters,
- makes proposals for the establishment of protected areas,
- regulates and controls activities in protected areas, organises activities of strict nature reserves, national and regional parks which are in its regulation sphere,
- compiles and supplements the Red Data Book,
- organises and performs activities related to the preservation and increase of rare and declining plants, fungi and animals,
- regulates the procedures of import and export of plants, animals, and trophies, and also the keeping of animals in captivity,

- determines the procedures for assessing the environmental impacts of economic activities and the approval of projects,
- organises and co-ordinates integrated ecological monitoring,
- organises and co-ordinates applied research related to biological resources protection, formation of networks of protected areas etc.
- increases the forest cover in the regions of Lithuania,
- controls the use, restoration and protection of Lithuanian forests,
- arranges inventories of forests, forest cadasters,
- organises inventory of forests' gene pools, selective seed farming and the restoration of forests.

Direct implementation of programmes for the conservation of biological diversity is the responsibility of strict nature reserves, national and regional parks' administrations. Special programmes aimed at the conservation of biological diversity are implemented at the local level by municipal institutions.

All the municipalities of Lithuanian cities and districts have environmental units or responsible officials. Pursuant to the Law on Environmental Protection municipal institutions within their competence arrange for the implementation of environmental protection legislation and decisions on the issues of environmental protection made by the Government and the Ministry of Environment.

In Lithuania there are about 80 environmental **non-governmental organisations** (**NGOs**). The main tasks of NGOs are to raise public environmental awareness, instil harmony into the relations between man and nature, involve the general public in the process of solving environmental protection problems, initiate co-operation with the general public in foreign countries, instil respect and love for nature, biological diversity and responsibility for its preservation for future generations, involve experts from specific fields of science into the work of public environmental information and the training of specialists. The main non-governmental organisations working in the field of biological diversity conservation are: Lithuanian Fund for Nature, Lithuanian Ornithological Society and others.

3.2.6. Biodiversity in agriculture

There are many local breeds and varieties of local origin cultivated in Lithuania. All they constitute a very important part of Lithuanian agricultural genetic resources. Varieties of agricultural plants are bred in the Lithuanian Institute of Agriculture and its branches, Lithuanian Agricultural University, Lithuanian Institute of Horticulture (see Table 5, Annex).

Gene pool of Lithuanian domestic animals and poultry is as follows:

- Cattle
  - Lithuanian Black and White
  - Lithuanian Red
  - Lithuanian White-back
  - Lithuanian Light Grey
- Pigs

  - Lithuanian Whites
  - Lithuanian local pig breed ('beady' pigs.)
- Horses
  - Lithuanian Heavy
  - Žemaitukai
  - Modern-type Žemaitukai
- Sheep
  - Lithuanian Black-head
  - Lithuanian coarse wooled
- Goats
  - Lithuanian native
- Geese
  - Vištinės

3.2.7. Lithuanian environmental strategy

Lithuania's Environmental Protection Programme, developed in 1992, included all major environmental problems of the day, highlighting them in priority order. Based on the Environmental Action Programme for Central and Eastern Europe, a new Programme was worked out in 1995 consisting of three volumes. Volume 1 – "Strategy motivation" contains environmental status assessment, national economy sectors' review, environmental change trend forecasts, a description of the institutional, legal and economic system in the environmental system. Volume 2 – "Strategy Methodology" – formulates the Strategy concept based upon environmental status analysis, presents the techniques selected for the assessment of environmental problems, their urgency and implications, outlines priority goals. Volume 3 – "Action Programme" – presents the long-term strategy, and short- and medium-term Action Programmes in relation to environmental components. Also, it includes strategy implementation means, environmental protection funding aspects etc. This Strategy was approved by the Parliament of the Republic of Lithuania (Decree No-I-1550) on 25 September 1996.

The goals for agriculture sector set up in the Strategy are:

- improvement of land use and soil fertility preservation,
- combination of intensive and extensive agriculture, promotion of environmentally clean agricultural production, introduction of sustainable bio-organic agriculture, primarily in the Karst region,
- revision of acceptability of the further use of some agricultural objects located in environmentally sensitive areas,
- ensuring safe use of plant protection measures, fertilisers and other chemicals.

The National Environmental Strategy of Lithuania was prepared by the Ministry of Environmental Protection, together with science and other design organisation specialists and firms from Ireland IDI (International Development Ireland), and the conservation of biota resources and landscape protection was included in this document as a separate part.

The action plan, among others, includes Table 6 (see Annex).

3.2.8. National Biodiversity Strategy

With the ratification of the Rio de Janeiro (1992) Convention on Biological Diversity (CBD) in July 1995, Lithuania undertook an obligation to start implementation of the Convention. This includes preparation of the country study and action plans. The National Environmental Strategy of Lithuania was the first step in preparing the action plans for biodiversity conservation, and was used as the background for the Action Plan for Biological Diversity Conservation.

In 1995, following the World Bank recommendations, Pilot National Action Plans were developed for the conservation of biological diversity of the three Baltic States. The document was ratified by the Government of the Lithuanian Republic. Following financial aid from the World Bank for preparing the Biological Diversity Strategy it was decided to prepare a Lithuanian Republic biological diversity conservation strategy and action plan on the basis of the National biological diversity conservation action plan.

In Lithuania, on the initiative of Environmental Protection Ministry, in 1996 when the World Bank offered financial aid, work on the Lithuanian Republic biological diversity conservation strategy and action plan was begun. The efforts are aimed at the development of the Biological Diversity Conservation Strategy and Action Plan for the conservation of the country's biological diversity – major ecosystems and species – for future generations, at the same time contributing to the global conservation efforts which employ every measure known and available to mankind, at laying down the foundations for sustainable use and management of biological and landscape diversity by integrating its conservation measures into the national economy development programmes. The Biological Diversity Conservation Strategy has been developed based upon the Pilot National Action Plan for the Conservation of Biological Diversity, which has been made more specific with regard to ecosystems, the current status analysis has been supplemented with new data, the cartographic material expanded and the Strategy Section included. The National Action Plan for Biological Diversity Conservation was developed using the National Environmental Strategy materials, supplementing it with biogeographic units of Lithuania, presenting the distribution of protected areas in biogeographic units; concrete actions were proposed, recommended projects indicated which needed foreign financial assistance etc.

The Biological Diversity Conservation Strategy and Action Plan is prepared for the next 20 years although most of the actions are meant for 5 years. So in five years time a new action plan will have to be developed.

With regard to **agricultural environment ecosystems**, the National Biodiversity Strategy and Action Plan says the following. In order to maintain a sufficiently rich biological diversity in agrarian areas it is necessary, to the broadest extent possible, to introduce specific agricultural practices, technologies, form versatile agricultural landscapes under biotope conditions, apply specially adapted economic/organisational and legal measures (institutional regulation) as well as educate and train the subjects of agriculture.

Any programme aimed at the restructuring of agriculture, including sustainable farming, sustainable or bio-organic agriculture should contain special sections and

include measures for the preservation of the biological diversity. The pilot programme Tatula should be further expanded and, as much as possible, its experience shared elsewhere; its environmental programme implementation has been based on an acceptable economic mechanism. With the establishment of a special co-operative organisation – Tatula Fund – the restructuring process attracts enterprising farmers on a voluntary basis. Long-term credits, extended to economic subjects at no interest, as well as many other advantages and services, have well justified themselves.

In areas which are highly valuable from the biological diversity protection point of view, agricultural activities can be either regulated or totally prohibited. Considerable delimitation of agricultural activities should be compensated to juridical and physical persons.

In preparing cartographic material information on drained and natural lands, data on the intensity of land use and areas flooded during spring should be noted as well.

For the implementation of the Action Plan for protecting agricultural ecosystems (see Table 3.11) about 0.1 million LTL* were needed, for priority actions, 0.05 million LTL.

To ensure stability in biodiversity, the main arrangements in agriculture would be the following:

- in the development of agriculture, propagation of organic (less intensive) agriculture should be considered, this would allow protection of genetic variety as well as valuable floral, fungal and faunistic elements of agro-landscapes,
- cultivation systems of relatively low intensity should be applied to many agricultural crops traditionally grown in Lithuania,
- traditional technologies of cultivation which were in use before the boom period of mineral fertilisers and pesticides application should be used more widely again,
- to preserve and enlarge areas of natural grasslands and pastures, combining harvesting with protection of biological species (plants, fungi, animals),
- to stimulate interest in activity which decreases the speed of succession processes in grasslands and wetlands, and which does not contradict the principles of biota protection,
- to increase the abundance of fungi and fauna, their variety and activity in tillage areas,
- to form and sustain landscape mosaics,
- to minimise the negative effects on the environment from the elution of fertilisers and pesticides.

* LITAS is the unit of Lithuanian currency: 1 Litas ≈ 0.25 USD ≈ 0.3 EUR.

Table 3.11. Action Plan for the protection of agricultural environment ecosystems

Actions	Time	Potential financial sources	Responsible institutions
1. Legal-institutional regulation			
1.1.*Development of management regulations for landscape management zones for the protection of ecosystems in agrarian areas	1998	SB	MOAF EPM
1.2*. Create methodology for an integrated ecological assessment of agrarian areas	1998	SB	MOAF
2. Territorial planning/designing			
2.1. Highlighting of measures for the preservation of the values of natural landscape and biological diversity whilst preparing land management plans	1998-2005	SB	MOAF EPM
3. Research, monitoring			
3.1. Provide scientific basis for the programme of sustainable and bio-organic agriculture development	1999	SB	MOAF EPM
4. Information, training, education			
4.1. Preparation and publication of "Lithuanian biological diversity protection in agriculture"	1999-2000	SB, IF	EPM MES
4.2*. Creation of a training programme on biological diversity protection in agrarian areas	1998-2000	SB	MES EPM

* – priority actions
EPM – Environmental Protection Ministry
MES – Ministry of Education and Science
MOAF – Ministry of Agriculture and Forestry
SB – state budget
IF – international funds

For the section in plant-breeding the following should be considered:

- to cultivate tested and accepted breeds of crops,
- to cultivate plants typical of the regions,
- to apply different field rotation systems (multi year, including bare fallow),
- to enlarge the use of organic fertilisers,
- rational application of agro-chemistry (except growth stimulators, usually),
- not to destroy groves, single trees and small wetlands,
- to plant more high-tree-orchards instead of low-tree ones.

Cattle-breeding systems should be oriented towards the usage of natural and seminatural grasslands for the breeding of cows and sheep as well as (less often) horses and goats. For the section of cattle-breeding the following should be typical:

- small number of animals per area unit of cultivated land,
- extensive application of agrochemistry,
- low investments in soil drainage,
- relatively big area of natural or semi-natural vegetation,
- relatively abundant variety of plant species in grasslands and pastures,

- cultivation of local animal breeds, that are usually less fastidious,
- application of traditional agricultural methods (especially for hay making),
- less intensive usage of concentrated forage.

The biological diversity, as well as that of a landscape, depends greatly upon a variety of soil types, moisture gradients in the soil etc. The main **factors and principles of structure formation in an agricultural landscape**, which allow increased biodiversity, are the following:

- the proportion of area cultivated by methods of grassland agriculture should be increased in a regions with karst-effects and soil erosion,
- natural and semi-natural elements of a landscape, such as open water ponds (channels, reservoirs, small rivers, wetlands etc.), grasslands and groves should be distributed evenly,
- agro-landscapes should contain relatively large amounts of mature and overmature stands which are very important for some specific species inhabiting forests of late successional stages (the negative effect of insuliarisation could be compensated in part by the presence of wood of different age in groves, especially that of late succession stages,
- well developed ecotones in-between field shrubs, forest islands and open fields,
- the presence of a set of natural elements in a landscape, which compose a part of local natural framework.

It is suggested to strive for a distribution of the same habitats type (forests, bushes, wetlands, natural and semi-natural grasslands containing various amounts of moisture) with intervals not exceeding 400 meters. Such a distribution of habitats would help preserve the spread of genes even among less mobile animal species, and this is necessary for the survival of their metapopulations. The successful functioning of metapopulations allows one to assume that species will not become extinct due to fragmentation of their habitats.

The main **economic arrangements** for supporting biodiversity within the agricultural landscape:

- support of ecological farming by supplying soft or interest-free credits,
- making official agreements on ecological farming, which should foresee limitations (on draining, landscape transformation etc.) necessary to product biodiversity in special ("sensitive") places,
- in areas highly valuable for biodiversity, farming activity should be strictly regulated. In very special cases some activity should even be prohibited. Compensation for the losses which occur due to the regulation should be foreseen both for juridical and actual persons.

3.2.9. Programme for conservation of the genetic resources of the indigenous domestic animal breeds in Lithuania

Lithuania committed itself to the conservation of its genetic resources by signing the Convention on Biological Diversity in Rio de Janeiro on 11 June 1992. The third

clause of the Animal Genetics Law (No 1-384) of the Republic of Lithuania passed on 8 February 1994 indicates that one of the major tasks in animal genetics is conservation and improvement of Lithuanian animal breeds and their gene pools.

In Lithuania, the improvement of indigenous animal breeds by absorptive crossbreeding was begun on a large scale as far back as the end of World War I. In 1921, the Committee of the Ministry of Agriculture made a proposal to establish pure-bred herds of native animals with the aim to preserve the gene pools of indigenous breeds. However, this proposal was carried out only by the establishment by the Stud for Žemaitukai horses, which was subsequently lost during World War II.

Some of the indigenous animal and poultry breeds of Lithuania have become extinct, others, such as Žemaitukai horses, wattle pigs, ash-grey and white-backed cattle, native sheep and Vištinės geese are on the verge of extinction. Thus, the Lithuanian Institute of Animal Science (LIAS) took the initiative to organise the conservation of the endangered breeds. Several expeditions to the remote parts of the country were organised to collect and purchase the remaining wattle pigs and yemaitukai horses from the countrymen and the Vilnius Stud. The herds of wattle pigs and yemaitukai horses were established at the Institute. Vištinės geese could be found only in collections abroad. After the purchase and import of eggs, a small flock of Vištinės geese was successfully restored at the Institute. Small groups of native sheep, ash-grey and white-backed cattle are kept at the Training Centre of the Lithuanian Veterinary Academy (LVA) and the LIAS.

The LIAS has prepared brief programmes – proposals to FAO dealing with the conservation of the Žemaitukai horses, wattle pigs and ash-grey and white-backed cattle. Proposals for Indigenous cattle were prepared in collaboration with the LVA. At the end of March 1995, after an expert mission to Lithuania, the FAO Mission Conference for Central and East European countries recognised the above-mentioned three breeds as watched internationally. All the indigenous animal and poultry breeds were included into the FAO Global Databank for Animal Genetic Resources and the World Watch List for Domestic Animal Diversity. On 21 December 1995 the co-ordinating board for the Conservation of Domestic Animal numbers was set up, following the order issued by the Minister of Agriculture.

Currently, unfavourable conditions have arisen for such comparatively numerous breeds as Lithuanian White pigs, Lithuanian Blackface sheep, Lithuanian Heavy-Draught horses, the modern-type Žemaitukai horse and local breeds of goats. So far these breeds are not considered at high risk of suddenly disappearing, but in the future their conservation programmes should be prepared, too. However, now the primary goal is to save the ancient indigenous endangered breeds – local fasselled pigs, Žemaitukai horses, ash-grey and white-backed cattle, local coarse-wooled sheep and Vištinės geese. Thus, on 30 October 1996 the Co-ordinating Board passed a resolution to prepare the conservation programme for the ancient domestic animal breeds.

The national programme for the conservation of the genetic resources of the indigenous animal breeds was approved by decree of minister of Agriculture of Lithuanian Republic on 28 November 1996. It sets conservation programmes for Žemaitukai horses, Lithuanian Ash-grey and white-backed cattle, Wattle pigs,

Lithuanian native coarswooled sheep, Vištinės geese and Lithuanian native bees. The main resolutions of the Programme are:

1. The conservation of the genetic resources of indigenous farm animal breeds in Lithuania is a state affair;
2. The government supports the upkeep of Žemaitukai horses, wattle pigs, ash-grey and white-backed cattle and Vištinės geese in two main breeding centres for each breed and upkeep of local sheep in four different places;
3. Farmers and other breeders of pure-bred indigenous animals are subsidised by the state through the upkeep of pure-bred sires, or receive free insemination and productivity control services;
4. The breeders that distribute breeding material of indigenous animals should get the same extra pay as for other animal breeds;
5. Inbreeding can be avoided by keeping no less than 4 sire lines and 4 families in the main breeding centres;
6. Associations for different indigenous animal breeds should be founded for the conservation and multiplication of the animal genetic resources, issue of herd books and development of standard requirements for the indigenous animal breeds.

The following research programmes are recommended for the state funding: Assessment of properties of Lithuanian local ancient animal breeds, and Assessment of the native bee populations of Southeast Lithuania.

3.3. International funding for agriculture with regard to biodiversity

3.3.1. PHARE projects

The EU technical assistance program PHARE began its support for Lithuania's agricultural sector in 1991. Since then, PHARE has allocated about 29 million EUR to the sector. The amount of allocation varied from year to year depending upon priority areas selected and the volume of assistance required. Characteristically for PHARE program projects, one part of the resources provided was for development of institutional building, the other part for the procurement of equipment and other types of investment (see Tables 7, Annex).

At the beginning of the programme, the main attention focused on the development of an overall strategy for the agricultural sector. During the period of 1991–1994, the greatest part of PHARE allocations were given to the preparation of various feasibility studies for different sectors, technical assistance to the development of advisory services for private farmers, land reform, establishment of a land information system and rural banking system initiation. To address these issues, a Programme Implementation Unit was established within the Ministry of Agriculture.

Another PHARE agricultural program started in 1995. The strategic goal was to assist the Ministry of Agriculture and other public and private sector organisations in translating the Government's policies and reforms into practical market restructuring activities. 1995–1996 PHARE allocations for agriculture mainly concentrated on the provision of necessary financial resources for the sectorial reforms, restructuring of agricultural processing enterprises, strengthening of food control system, as well as substantial assistance for rural credit system generation.

Starting in 1997 the PHARE program shifted its emphasis to European Integration issues. Financial support has been provided for the establishment of prerequisite systems for future EU member states. Specific attention has been, and will be, paid to the veterinary and phytosanitary subsectors, land market development, strengthening of institutional capacity, establishment of integrated agricultural information systems and development of the fisheries sector.

The main direct beneficiaries of PHARE projects started in the last two years are the Ministry of Agriculture, Rural Credit Guarantee Fund, State Veterinary Service, State Plant Protection Service, State Laboratory of Milk Control, Lithuanian International Agricultural Trade Agency, Lithuanian Institute of Water Management, Institute of Agricultural Machinery Engineering, Milk Processors Association, Institute of Aerial Geodesy and other social and economic partners.

During the first quarter of the year 2000, the OMAS Consortium produced an Assessment Report for 'Assistance funded under the European Union PHARE Programme 1996–1999'.

The activities funded under the Programmes can be grouped under the following headings:

- Institutional Strengthening and Human Resources Development;
- Farm Restructuring and Development;
- Land Market;
- Quality Development for Agricultural and Food Sector;
- Agri-business Enterprise Restructuring and Development;
- Establishment of the Rural Banking System and Agricultural Information Systems.

Those projects involved the following activities:

- Assisting the task force on Credit management at the Agricultural Bank in assessing selected investment and working capital farm-loan applications, and training rural credit officers and analysts of the RCGF in farm loan appraisal methodology and techniques.
- Development of a legal and economic/financial concept as the basis for the framework law on credit guarantee institutions, and preparation of the Operational Manual of the RCGF.
- Assisting in the development of key staff, policy makers and leaders involved in the development of Lithuanian agriculture in areas related to EU integration.

Table 3.12. PHARE commitments and disbursements under each of the headings

Title	Commitment EUR	Disbursement EUR
Institutional Strengthening and Human Resources Development	1,413,937	723,153
Farm Restructuring and Development	999,960	528,323
Land Market Development	300,000	176,997
Quality Development for Agricultural and Food Sector	718,430	621,649
Agri-business Enterprise Restructuring and Development	466,452	250,250
Establishment of Rural Banking System	2,221,796	2,167,735
Agricultural Information Systems	919,350	0

Source: The Ministry of Agriculture, 1999.

- Assisting the establishment of legal and organisational framework for Lithuanian agricultural breeding systems, and improving the performance of the State Laboratory of Milk Control and Animal Breeding Information Centre.
- Procurement of equipment necessary to the operation of the orthophoto production line and related training.
- Improving LAITA services in dissemination of market reports on selected target markets, and strengthening overall management of LAITA.
- Assisting in organising a new system of animal identification and delivering know-how, methodology and documentation related to this field.
- Development of a promotional campaign for multifarm machinery use and educational lessons about multifarm machinery use.
- Assisting the Ministry of Agriculture to become effective in preparing the policy, administrative and legislative frameworks required to allow Lithuania to commence negotiation on EU accession.
- Provision of intensive training for staff of the selected 10 dairies, the Lithuanian Dairy Association, local training providers, local consultants and other in modern quality management, practical implementation of HACCP, internal calibration, the introduction to the document control requirements of ISO 9000 and the design of Quality Manual.
- Provision of focused practical consultancy inputs to the ten dairies with the aim of raising quality standards by developing the concept of quality assurance, modern food safety and ISO 9000 requirements.
- Assisting the dairies in the development of the improvement of raw milk quality at farm level.
- Assisting State Veterinary Service and State Plant Protection Service to prepare a strategic plan that will focus on priorities, and to identify: (a) how the border inspection service is to be organised at national and border levels; (b) which border posts have to be chosen to be upgraded to reach EU requirements; (c) what equipment is required at border inspection posts as well as domestic laboratories, and its cost, prepare the supply of the equipment for the new system; (d) an appropriate form of central and small laboratory control.

- Developing a Land Reclamation Association and setting up of a land reclamation GIS;
- Procurement of drainage maintenance machinery, training aids and materials, hardware and software for GIS, survey and diagnostic equipment related to subsurface drainage.

The activities resulted in:

1. The development of Multifarm Use of Machinery (MUF) strategy, a printed set of educational materials about MUF and their introduction in the seminar, and guideance on machinery options has been printed and disseminated.
2. Increasing number of subscribers to the publications of LAITA on agro markets, yearly sector reviews about dairy, grain and meat sectors were produced, and database and mass-mailing tools for domestic food companies assembled. Additionally, companies with key niche-products for export were identified, joint export shipments facilitated, and proposal for joint-branding, including a schedule, statute, budget, brand manger and interim premises.
3. The delivered outputs deepened professional skills and expertise of Lithuanian land reclamation specialists in specific activities of the land reclamation process. Various items procured from the project resources were used in the demonstrations and raised farmers' awareness of the advantages of land reclamation as a daily undertaking. The experiences of Western countries has been disseminated to wide audience of Lithuanian specialists.
4. Operational Manual of the Rural Credit Guarantee Fund prepared.
5. Staff of the Institute of Aerial Geodesy were trained in how to (a) operate the orthophoto production line, (b) organise production, (c) guarantee sustainability of the solution proposed through maintenance organisation, (d) guarantee integration of the system with the existing mapping configuration, and (e) more than 30 orthophoto sheets (scale 1:10,000) were produced and the accuracy of those orthophotos checked.
6. Organised a new system of animal identification: (a) prepared a description and scheme of existing Lithuanian system of animal identification of breeding and non-breeding area and a comparison between the existing Lithuanian animal identification activities and EC requirements; and (b) prepared a proposal of a new system of animal identification.
7. Audited GHP and HACCP systems and advised on GHP, GMP and HACCP implementation, analysed the situation regarding the quality of raw milk, reviewed the calibration issue and recommended how to improve internal calibration, trained of certification procedures, packaging.
8. Provided intensive training in food safety and hygiene, HACCP and quality assurance and audit techniques.
9. A strategic plan for the State Veterinary Service and State Plant Protection Service was prepared. Additionally, 9 veterinary and 7 phytosanitary border inspection posts (BIP) that have to be upgraded were identified and described; the investment cost for the upgrading of the physical infrastructure was esti-

mated for each of the long term BIP, as well as equipment for BIPs (small laboratory control at BIP), CL and laboratory at Klaipėda and their costs were identified.

10. Identified the appropriate forms of National Veterinary Laboratory and Central Plant Health Laboratory control.

11. Office equipment was purchased for Medininkai BIP. Other funds for the purchase of equipment was reallocated to the payment for the services provided by local architects.

12. Breeders Associations were provided with comprehensive documentation on the elaboration of breeding programmes. Substantial support was provided to the Breeders Associations in the formulation of their statutes and design of their organisational structures to enable them to provide cost-effective breeding services and to get full co-operation with cattle breeders. A tentative business plan was prepared for Breeders Associations and submitted to Breeders Associations and Ministry of Agriculture.

13. Extended and improved the performance of State Milk Quality Control Laboratory in Kaunas by: (a) necessary equipment for the analyses for somatic cell count procured, (b) elaborated detailed laboratory running and management instructions, (c) submitted application for accrediting the State Milk Quality Control Laboratory according to ICAR rules, (d) concept for the reorganisation of milk collecting and recording has been prepared in close co-operation with Lithuanian Dairy Association, Milk Laboratory and Ministry of Agriculture, (e) proposals on making Milk Quality Control Laboratory self-sustainable and self-financing were worked out; European standard structure for bookkeeping has also been handed over.

14. Improve the performance of Animal Breeding Information Centre (ABIC) by: (a) joining the data processing network of ABIC, Kaunas Milk Laboratory and Animal Recording Centre, (b) strengthening ABIC data base, (c) improving knowledge of ABIC staff in data bank development and genetic evaluation.

As the results of the previous PHARE assistance programmes indicate, the program has been playing a major role in transferring know-how and building institutional capacity. Strengthening of the administrative bodies (e.g. the Ministry of Agriculture), the control institutions (e.g. State Veterinary Service, State Laboratory of Milk Control) and other public organisations creates a framework required for EU integration. At the same time, it is followed by structural changes in the agricultural sector: for example, strengthening of control institutions, together with related investment support, has made an impact on the improvement – although, slight – of raw milk quality.

From all the PHARE projects implemented in Lithuania until now, we can distinguish the Land reclamation project, as the one that included environmental analysis and the part on landscape and biodiversity protection. The project was started in order to assist the Lithuanian Government with the preparation of a new Land Reclamation Development Strategy. The main component of the project was a study on possible options for reconstruction, organisation, construction and maintenance of land reclamation facilities under different conditions of land use. Two

administrative districts were selected for this purpose – one with productive agricultural lands and one in a Less Favoured Area. Analysis of possible scenarios comprises economic, social, hydrological and environmental aspects. The project report contains chapters on Landscape and Ecology and Environmental impact analysis. Alternative scenarios also included renaturalisation measures, development of local ecological networks and were based on principles of biodiversity conservation and sustainable use of natural resources.

The most important PHARE project currently running in Lithuania is Technical Assistance to Special Preparatory Programme for Structural Funds. The Lithuanian government has been assisted by the EU PHARE Programme to achieve the objectives set out in the Accession Partnership and reiterated in the **National Programme for the Adoption of the *Acquis*** (May 1999). In particular, the **SPP** (Special Preparatory Programme) has specifically targeted a number of areas (see below) to prepare for and support the accession process.

Very significant progress has been made in all of these areas by the Ministry of Public Administration Reform and Local Authorities (**MoPARLA**), which is the co-ordinator of the preparation for the pre-accession in the field of regional policy and cohesion, by the different sectoral Ministries and by various national and regional institutions. The purpose of the present project is to provide technical assistance (TA) simultaneously to all of these areas, to build on the achievements to date and to bring developments in these areas to a successful conclusion.

Constituting a core part of Special Preparatory Programme for the **Structural Funds** the project covers 6 SPP action areas:

M1 – General Administration

M2 – National Development Plan

M3 – Sound Financial Management

M4 – Legal Framework

M5 – Preparation for ISPA

M6 – Preparation for SAPARD.

All of the 6 measures contain a variety of technical assistance.

Measure 6: Preparation for SAPARD has to produce the Rural Development Plan required under SAPARD Art. 4(2), including prior appraisal, and a certain number of high priority projects to be ready for the implementation from the start of the SAPARD programme. It will involve the training of officials in the Ministries of Finance, Economics and Agriculture and other related ministries and agencies and regional and local levels of government in the preparation and management of the rural development plan under SAPARD. The training will be accompanied by the production of a Guidance Manual for administration and a Project Development Guidebook for the project animators.

The preparation for SAPARD is closely interconnected with the rural pilot project in Utena County. While the Rural Development Plan will cover all the rural areas of the Lithuanian territory, the rural development pilot project will be focused on development of rural areas in a specific identified region.

The Lithuanian legal and institutional framework has been assessed, and the adaptations needed to it for operating SAPARD in conformity with EU legal provisions identified. Major adjustments were made in provisions of the Rural Support Fund and the Law on the State Regulation of Economic Relations in Agriculture was amended.

With regard to institutional adaptations for operation of SAPARD, the Paying Agency was established. Partnership with other agricultural institutions and organisations have been formed (e.g. Lithuanian Institute of Agrarian Economics, Lithuanian University of Agriculture, Lithuanian Chamber of Agriculture etc.), preparation of the RDP was carried out with consultation of the social partners.

From PHARE funded projects implemented by Lithuanian NGOs, a PHARE partnership programme project "Facilitation of sustainable use of natural resources in lagoon municipalities of Lithuania", implemented by EUCC Baltic office, EUCC Italy, Žvejonė environmental club, Lithuanian Fund for Nature and Rusnė Fund for Nature should be mentioned. This two-year long partnership and co-operation project, started in 2000, aimed to develop a coherent set of services for the facilitation of the sustainable use of natural resources and thus to improve economic performance in the Curonian Lagoon region of Lithuania, whilst protecting its unique natural environment. The key services provided to private users and local administrations within the project activity framework is knowledge dissemination and user-tailored advice on such critically important issues as land, forest and fish stock management. The advice is being provided through the helpdesk established by the EUCC Baltic Office and its partner organisations.

Along with the helpdesk services, several other activities are carried out. These include: sustainable agriculture and eco-tourism demonstration programmes, development of the sustainable fish stock and coastal-peatland management plans, and an eco-tourism promotion plan for the Curonian Lagoon region.

3.3.2. The World Bank projects

Concerning biodiversity protection, the Word Bank was financing the preparation of the Lithuanian National Biodiversity Strategy, as described above.

The World Bank has only one project related to agriculture and rural development in Lithuania. It is the Private Agriculture Development Project that started in 1996 and should end at the end of 2001. The World Bank does not know yet if continuation of this project will be considered, because currently there is not enough interest from the private agricultural sector in it.

The main objectives of the Private Agriculture Development Project are to assist the government with the development of a viable, private agricultural sector and to foster economic growth in rural areas by providing a combination of financial and technical assistance. The project has two main components:

1) a rural credit component (RCC), which includes 30 million USD line of credit and an institutional development program for the Agricultural Bank of Lithuania (ABL) and local banks; and

2) an institutional and human resources development component (IHDC), which consists of technical assistance for land reform, extension services, marketing, business skill training, and rural employment generation and targeted poverty alleviation.

The RCC aims to:

- strengthen and restructure rural credit delivery systems,
- develop commercial lending channels for rural credit,
- restructure the ABL,
- finance the upgrading of technology and production facilities,
- foster the development of private farms and promote the emergence of private small and medium enterprises in rural areas, and
- provide seed-corn money for opportunities for income and employment generation in rural areas.

Finally, the objectives of the IHDC are to:

- increase productivity, competitiveness, and marketing prospects for Lithuanian products,
- expedite land reform and develop a mortgage system for increased access to credit,
- increase the availability of alternative employment opportunities through retraining and diversification of farm businesses,
- reduce rural poverty,
- improve human skills and local institutional capacity, and
- improve business management skills of farmers and entrepreneurs in identifying, evaluating, and pursuing business development opportunities.

Environmental provisions were not highlighted in this project, and it has nothing to do with biodiversity protection. However, currently the World Bank is preparing its Rural Development Strategy, which, after approval, will serve as a basis for environmental requirements for all World Bank projects on rural development and agriculture.

3.3.3. Other projects on development of agriculture containing environmental aspects

In Lithuania, there are a number of projects that were recently implemented or are still ongoing, that are related to agri-environmental issues. The projects are listed in the Table 8 (see Annex). Most of them are connected with minimisation of pollution from agriculture, and only a couple of them emphasise issues of biodiversity protection.

Over the last decade more and more agricultural lands in Lithuania have become abandoned and are no longer being regularly cultivated. The Lithuanian government views afforestation of such abandoned agricultural lands as a priority in cases where forestry can be considered the optimal land use. However, the present system for land use planning for afforestation requires improvements in order that aspects such as: environmental and sustainable forest management; biodiversity

conservation; and other aspects are considered. In order to address the sustainable afforestation issue the project on "Afforestation of Abandoned Agricultural land" was initiated in May 1999 by the Lithuanian Ministry of Environment, with financial and technical support from the Danish Ministry of Environment and Energy. The project is implemented within the Department of Forests and Protected Areas, and technical assistance is provided by the Danish consulting firm, Danagro a/s, jointly with Danish Forestry Extension, a national secretariat for private forest owners' associations in Denmark.

The project is managed by a Project Management Team, consisting of a Lithuanian Project Co-ordinator and Assistant Project Co-ordinator, a Danish part-time Project Manager, and a Lithuanian Project Director from the Department of Forests and Protected Areas. The project started in May 1999 and the planned duration of the project is two years but an extension of 6 months is under discussion. The Danish government has allocated 3.9 mln LTL (7.4 mln DKK) for the implementation of the project. Funds are being used for technical assistance, contractors, training and education, equipment and machinery, and various operational costs.

The project is implemented at three levels – national, county and regional – the latter consisting of a number of pilot afforestation projects and land use planning in Utena and Lazdijai regions within Alytus and Utena counties.

Project implementation is focused on:

- Formulation of policies and strategies at the national level, favouring sustainable afforestation, and a significant contribution to the establishment of a revised framework and procedures concerning legislation and planning for sustainable afforestation (analysis of the legislative framework governing afforestation and recommendations for improvements, analysis of international treaties, conventions and other instruments related to afforestation, technical support in developing afforestation policy and strategy etc).
- The development of proper land use planning procedures, and the promotion of decentralised land use planning and mapping processes from the national to the county and regional levels. Examples of sustainable land use planning for the designation of afforestation areas will be carried out in the two pilot regions.

During the project implementation a "traditional" land use planning approach for afforestation, based on present regulations and criteria, as well as an alternative land use planning for designation of areas suitable for afforestation, based on draft national guidelines prepared by the project in the two pilot districts (Lazdijai and Utena), will be done. The main objective of such a "dual" planning exercise is to collect experiences that can be used as a basis for improving the current regulations for designation of afforestation areas ("Concerning the approval of the procedure for afforestation on private land. 9 April 1998. Decision of the Government" and "The regulations on development of the forest land management scheme, 7 April 1999, Order by the Minister of Agriculture and the Minister of Environment"). Present land use planning is based on economic criteria (soil fertility factor 27) and only areas where soil fertility is below 27 can be designated for afforestation. However, ecological and social values are of equal importance in planning future forests. In the alternative planning there are 2 main guidelines that should be fol-

lowed in designating areas where forests are wanted and where afforestation is not allowed. These are *"Less Favoured Areas for agricultural production"* and *"Protection of biodiversity"*. Also, other guidelines depending on the local strategies, policies and problems can be used: protection of underground water, protection of water bodies, erosion prevention, landscape, cultural heritage, recreation, non agricultural lands etc. Planning is expected to be finished in June 2001. Funds allocated for land use planning amount to 185,000 LTL (350,000 DKK).

- Criteria and methods for afforestation, and the development of appropriate technical methods and approaches to afforestation of marginal agricultural land. The project will test different silvicultural techniques and establish demonstration forests under different management objectives, on both public and private land in the Utena and Lazdijai region.

Demonstration forests to test different sustainable silvicultural techniques have been established on 36 ha of private land and on 100 ha of public land. As regards private land there have been 12 landowners selected in Lazdijai and Utena regions (6 landowners in each region, average size of each private plot 3 ha). The selection of the sites was based on the following criteria: location, relief, preservation of biological diversity and nature conservation, soil suitability for agricultural activities and soil mechanical composition, hydrological regime, plot size, landscape and meeting of demonstration purposes of the project. Highly diverse land areas were selected to demonstrate different afforestation and forest management models and different purposes of the forest. Public land which also demonstrated different sustainable afforestation methods was afforested by Utena and Veisiejai forest enterprises.

80 per cent of the costs of demonstration afforestation and forest management on private land was covered from the Project Demonstration Fund (175,000 LTL or 306,250 DKK). The price of planting and management of high quality forest is about 4000 Lt. per hectare. The contribution of a landowner will amount to 800 Lt. per hectare. All the afforestation and management activities will be evaluated, therefore, a landowner may choose between contributing to the process in cash or by work (ploughing, planting, spraying, weeding etc.). The landowner's contribution is very important in order to ensure his interest and responsibility for the planted stand, the more if the owner carries out some afforestation/management work himself. If the forest takes good effect and is properly tended, after a year the owner will receive compensation equal to 10 per cent of his contribution.

- Raising awareness about afforestation through information, campaigns, training, study tours to neighbouring countries and within Lithuania for policy makers, technical staff and landowners (workshops, seminars, training courses, study tours, awareness campaign, articles in the newspapers and magazines, programmes on TV, brochures, leaflets, booklets, technical notes etc).

Provided that a sound planning is carried out, afforestation of such areas will mean:

- ecologically improved landscapes because of increased variation in the size of plots and type of plots in the afforested area,
- improved diversity of forest types in the landscape,

- protection of areas subject to erosion,
- immediate and considerable long term employment opportunities and economic development,
- increased production of forest products, which are considered to present a higher export-potential than agricultural products in view of further evolution of the number of EU-member states and the general agricultural situation in Europe,
- protection of ground water resources.

3.4. General comments: whether agricultural policy and the activity of biodiversity protection is sufficient to protect biodiversity

Practically all human activities, and all economic sectors have an impact upon biological diversity. Therefore, measures for the preservation of biological diversity, as well as the general environmental measures, should be provided for in developing programmes for all separate sectors of the economy. Human economic activities which do not conform with the preservation of biological diversity are of adverse effect upon the environment and living nature. It is very important that the preservation of the biological diversity should become an integral part of the policies on agriculture, forestry, industry, construction planning, hunting and fisheries. This is especially needed now, with the present decentralisation and when the use of natural resources is intensifying. Preconditions for a theoretical co-ordination of the interests of economic sectors in concrete areas are provided by the general territorial planning documents. The currently existing programmes of different economic sectors (agriculture, forestry, minerals etc.) theoretically include the protection of biological diversity; however, in practice there is insufficient involvement in the necessary protection efforts by many of the institutions which use and study biological resources, and their activities are also not at all adequately co-ordinated.

The quality of biological diversity is threatened by land-reclamation, intensified forest felling, damage of forest ecosystems because of natural calamities and pollution, change in ecological conditions of meadows due to economic activity or its reducing (abandoned farmland), making of rivers and rivulets into ponds etc. A major underlying cause of these inadequacies is the low level of environmental consciousness.

Conservation of biological diversity in most part depends on the principles of biological diversity, application of criteria while preparing all level and all kinds of planning documents, foreseeing the means needed for conservation of biological diversity. Too little attention is paid to biological diversity conservation in the documents of Lithuanian economic sectors' programs.

The development of the forest and agriculture sectors, as well as the attitudes of the land use and nature protection they employ, have always been, and still are, of particular importance for the preservation of Lithuania's biological diversity.

Lithuania has quite a good number of strategies, action plans and other documents related to protection and enhancement of biodiversity, also in relation to the pro-

posed activities of the agricultural sector. National environmental protection strategy and biodiversity conservation strategy aims to decrease pollution by organic and mineral fertilisers and other agricultural chemicals, manage landscapes, habitats and species. Protection of soil, air, water and gene pools is considered to be one of the main goals of the state agricultural policy. For implementing this measure, the state will try to make its aims of agricultural production compatible with its aims for environmental protection, in order that: agricultural activities will not disturb natural biological and microbiological balances; will not destroy valuable wild plant and animal species; and will preserve gene pool of domestic plants and animals.

Achieving the goals set out in the strategies should be carried out through implementation of specialised programmes and investment projects. However, very little has been done up till now to implement most of the measures and actions set out in those officially approved documents. The measures that have been implemented mostly relate to minimisation of agricultural pollution, while those directly concerning biodiversity conservation still remain only as plans on paper, except for regulations concerning the management of protected areas (national parks, nature reserves etc).

This is happening for several reasons. First of all, it is caused by a lack of political will to understand that biodiversity conservation is an urgent priority. Until now, pollution (including that from agriculture) is considered to be one of the most important environmental problems in Lithuania, therefore the actions related to minimisation of pollution gain more attention from the state institutions. Continual changes in the government also do not help to consolidate the efforts for environmental protection and biodiversity conservation. Further, the complicated and poor economic situation of the country, creating lack of funds, is considered to be an official excuse for the responsible institutions not doing much in the field of biodiversity protection. Both Ministries of Agriculture and Environment are well aware that, in practice, biodiversity protection issues are not included in present actions or activities of the state, in spite of all nice statements and priorities set out in their various strategy documents. The Ministry of Environment is currently applying for GEF funding for a biodiversity study of the country, and last year (in 2000) it allocated 10,000 LTL from Environmental Protection Fund for the promotion of organic farming in protected areas. This was the only concrete action relating to agriculture undertaken by this Ministry. The preparation of the national agri-environmental programme by the Ministry of Agriculture, took a longer time than was expected. In preparation of this programme the Ministry used the results of the project on agri-environment implemented by Lithuanian Fund for Nature, and the budget of the Rural Support Fund of 1999 contained a budget line *'Implementation of agri-environmental measures in the pilot area (Rusnë island)'*. Unfortunately, this information was not communicated directly to the farmers living in the area, and accordingly, nobody applied for funding from this budget line. Thus, the Rural Support Fund's budget of 2000 no longer contains that money.

Another very important obstacle for biodiversity conservation in the agricultural sector is lack of co-operation and communication between the two ministries (Agriculture and Environment). Several years ago, the Ministry of Environment initiated

the establishment of the joint working group on environmental issues in agriculture, but due to low interest from the agricultural side, this initiative has died.

Low environmental consciousness and understanding within other ministries and organisations is caused by a lack of education. An initiative from the Environmental Protection Ministry in Lithuania started an 'ecological education programme' aimed at the general public and various qualification specialists in education. According to their competence, ministries and departments organise ecological education, and their activities are co-ordinated by the Environmental Protection Ministry. However, such educational activity is mainly related to environmental quality rather than to the preservation of biological diversity.

Today practically all higher schools in Lithuania have special courses in ecology, environmental research and land management. Vilnius University is most experienced in arranging such courses, though it does not have specialised departments for the purpose of training specialists in these areas. Environmentalists (with a narrow profile of expertise) are trained at the Agriculture University, Vilnius Gediminas Technical University, Kaunas Vytautas Magnus University and other high schools. Environmental research has not, so far, been included in the list of natural sciences. No specialised educational programme on biological diversity issues has been developed.

There is no special programme for the training of the medium level specialists, their education, improvement of qualifications, or for the improvement of ecological and environmental education of school-children. Since 1993 the "Tatula" Fund in the karst region has been implementing a wide ecological education and training programme.

However, during the last few years, activities related to biodiversity protection in agriculture have considerably increased. There are quite a few projects directly connected to this. The Lithuanian agriculture extension service has also launched a programme for biodiversity conservation and is advising farmers that want to do something how to improve matters in this regard.

Currently, we also have to admit, that measures and actions for environmental protection and biodiversity conservation in agriculture do not have a unified trend and are set out in many different strategy documents. But after Lithuania has made a political decision regarding EU integration, all legal documents have to be harmonised. The EU accession process has favourably influenced agri-environmental issues. The fact that the Lithuanian National Rural Development Plan and SAPARD contain agri-environmental measure is a clear result of that. All previous versions did not contain this measure, in spite of the efforts of NGOs, environmentalists, Ministry of Environment and agri-environmental specialists of the Ministry of Agriculture. This measure was included in the plan the very last moment, after the Commission declared that the Lithuanian SAPARD programme would not be approved if the agri-environmental measures were not included. But the only sentence concerning rural development in Lithuania in the regular report from the Commission on Lithuania's progress towards accession (8 November 2000) is "As regards rural development, agro-environmental policy should be promoted".

However, agro-environmental policy is still a low priority for the Lithuanian government, since all the other SAPARD measures, including Afforestation of Aban-

doned Agricultural Land, do have related national measures and are connected with PHARE 2000 and bilateral projects (incl. PHARE 1999), and the measure 'Environmentally Friendly Agricultural Methods' is left solely for SAPARD funding.

In conclusion, we should say that Lithuania has a good **theoretical basis** for the integration of biodiversity protection issues into the agricultural management sector, but, because of political inaction and economic constraints, **practical implementation of related measures is going very slowly**. A start has been made already, but there is still long way to go before significant progress and results will be seen. EU integration will certainly speed up this process, and would be the main political drive behind it. However, unless the policies are indeed enforced soon, it is quite possible that much biodiversity will be lost, unnecessarily, for short-term economic gain, in a transition period between EU economic aid and the actual implementation of the proposed biodiversity conservation measures.

Appendix Lithuania

Table 1. Budget of the Rural Support Fund for 2000 (in thousand LTL)

Budget item	Expenditures
Covering unpaid subsidies of 1999	240400
Subsidies for sugar beets purchased for processing	67550
Subsidies for agricultural production sold	17000
Partial funding of SAPARD programme costs	10000
Programmes related to preparation for the EU accession	15289
Stock breeding programme	9900
Agricultural research programmes	3400
Support for farmers in the form of training and consulting services	6500
Compensation of interest of loans	5000
Support in case of disaster, also support for apiculture	500
Organic farming	400
Compensation of expenses of setting up and modernisation of dairy farm	1500
Co-operation development programme	500
Rural Loan Guarantee Fund	4000
Repayment of loan of Ministry of Agriculture	38500
Introduction of electronic catalogue of export of Lithuanian agriculture and agricultural products	700
Expenses for 2000	180739
TOTAL	**421139**

Table 2. Budget of the Special Rural Support Programme for 2001 (in thousand LTL)

	Budget item	Expenditures
	Revenue of the Special Rural Support Programme in 2001	265997
	From this:	
	State budget funds	256997
	Assets from earlier loans from the Rural Loan Guarantee Fund, Farmers Support Fund, part of interest of these Funds, etc.	9000
	Expenditure of the Special Rural Support Programme in 2001	265997
	From this:	
	Covering unpaid subsidies of 2000	86200
	From this:	
1.	Direct payments for rape crop area	2400
2.	Direct payments for cereals	18000
3.	Subsidies for flax straw sold	7600
4.	Social support for 1-2 cows holders	10200
5.	Support for private storage of grain	600
6.	Intervention measures of the Lithuanian Agriculture and Food Market Regulation Agency in 1998-2000	40000
7.	Repayment of loan taken for purchasing grain of 1996	7400
	Expenditures for 2001	
8.	Direct payments for rape crop area	7600
9.	Direct payments for flax crop area	12600
10.	Direct payments for suckling cows	1000
11.	Compensations for Diesel fuel	52000
12.	Rural Loan Guarantee Fund	4000
13.	Farm modernisation programme (implementation of investment projects that won't be funded by SAPARD)	4700
14.	Repayment of loan of Ministry of Agriculture	12000
15.	Intervention measures of the Lithuanian Agriculture and Food Market Regulation Agency in 2001	19200
16.	Support for purchasing of bloodstock and seeds of high quality	5000
17.	Stock breeding programme	10000
18.	Agricultural research programmes	5100
19.	Support for farmers in the form of training and consulting services	7600
20.	Compensation of interest of loans	11400
21.	Support in case of disaster,	1000
22.	Organic farming	500
23.	Co-operation development programme	2000
24.	Monitoring of mad cow disease	500
25.	Programmes related to preparation for the EU accession, from them:	20700

	Budget item	Expenditures
25.1.	Development of agriculture and food products quality research system in compliance with the EU requirements	8500
25.2.	Development of programme for the registration and identification of animals and stock-breeding programme in compliance with the EU requirements	6100
25.3.	Partial compensation of investment expenditures of specialised dairy farms complying to the EU requirements according to business plans approved during earlier years	5000
25.4.	Information programme on the registers of land parcels, and crop area	1100
26.	Livestock productivity control programme	197
27.	Targeted programme of new technologies	2000
28.	Introduction of electronic catalogue of export of Lithuanian agriculture and agricultural products	700
	TOTAL	**265997**

Table 3. SAPARD total (2000–2006) breakdown of EU allocations

Measures	Total eligible cost	Public expenditure						Private contribution	
		Total		EU contribution		National contribution			
	EUR	EUR	%	EUR	%	EUR	%	EUR	%
Measure 1: Investment in agricultural holdings	276.295.486	129.877.759	47,0%	97.408.318	75,0%	32.469.441	25,0%	146.417.727	53,0%
Measure 2: Improving the processing and marketing of agricultural and fisheries products	129.424.958	58.241.232	45,0%	43.680.924	75,0%	14.560.308	25,0%	71.183.726	55,0%
Measure 3: Development and diversification of economic activities	45.485.786	22.742.893	50,0%	17.056.407	75,0%	5.686.486	25,0%	22.742.893	50,0%
Measure 4: Improvement of rural infrastructure	52.480.016	43.033.620	82,0%	32.275.215	75,0%	10.758.405	25,0%	9.446.396	18,0%
Measure 5: Afforestation of agricultural land and improvement of forest infrastructure	20.498.670	10.249.335	50,0%	7.687.763	75,0%	2.561.572	25,0%	10.249.335	50,0%
Measure 6: Environmentally friendly agricultural methods (1)	2.832.227	2.832.227	100,0%	2.124.171	75,0%	708.056	25,0%	0	0,0%
Measure 7: Vocational training	4.968.572	4.968.572	100,0%	3.726.429	75,0%	1.242.143	25,0%	0	0,0%
Measure 8: Technical assistance, information and publicity campaigns (2)	5.664.442	5.664.442	100,0%	4.248.335	75,0%	1.416.107	25,0%	0	0,0%
Total	**537.650.157**	**277.610.080**	**51,6%**	**208.207.562**	**75,0%**	**69.402.518**	**25,0%**	**260.040.077**	**48,4%**

(1) – As this measure will be implemented in 2002 after consultation with the Commission on detailed provisions, the aid intensity will be fixed at that stage respecting the relevant community legislation

(2) – For this measure Community contribution to financing may in justified cases amount up to 100% of total eligible costs as provided for in Art. 8(1) of Regulation 1268/1999. In such cases justification for the application of rates for Community contribution higher than 75%, including the rate proposed, must be submitted to the Commission for approval prior to its application.

Table 4. The most important local plant varieties cultivated in Lithuania

Winter wheat	*Širvinta*
Winter rye	*Duoniai* *Rukai*
Spring barley	*Aidas* *Ūla* *Aura* *Auksiniai* *Alsa*
Out	*Jaugila*
Lentil	*Diskiai* *Smėlininkai*
Fodder peas	*Kiblukai* *Greitieji*
Vetch	*Tverai* *Baičiai* *Pilkiai*
Fodder bean	*Kupa* *Ada*
Lupine	*Augiai* *Trakai* *Snaigiai*
Potatoes	*Venta* *Vokė* *Nida* *Mirta* *Vilija* *Vilnia* *Aistės*
Flax	*Vega*
Caraway	*Gintaras*
Fodder beets	*Ekendorfo geltonieji* *Puscukriniai baltieji* *Raudoniai* *Dotnuvos geltonieji*
Fodder swedes	*Vėžaičiai* *Lobiai*
Red clover	*Liepsna* *Kamaniai* *Vyliai* *Arimaičiai* *Kiršinai*
Pink clover	*Daubiai*
White clover	*Bitūnai* *Atoliai* *Sūduviai*
Alfalfa	*Žydrūnė* *Birutė*

Tomatoes	*Ryčiai* *Svara* *Viltis* *Laukiai* *Aušriai* *Pirmutis* *Skariai* *Sveikutis* *Trakų pagerinti* *Kauniai* *Daugiai*
Onions	*Lietuvos didieji*
Garlic	*Žiemiai*
Carrots	*Šatrija* *Garduolės* *Svalia* *Vytėnų Nanto*
Red beet	*Kamuoliai* *Ainiai* *Nevėžis* *Vytėnų Bordo*
Radish	*Žara* *Kretingos pagerinti*
Bean	*Baltija*
Apple trees	*Auksis* *Rudeninis dryžuotasis* *Aldas* *Noris* *Štaris*
Pear trees	*Alka* *Jūratė* *Alsa*
Plum trees	*Rausvė* *Štaro vengrinė* *Vengrinė paprastoji*
Cherry trees	*Vietinė rūgščioji* *Vytėnų žvaigždė* *Žagarvyšnė*
Sweet cherries	*Vytėnų juodoji* *Vytėnų rožinė* *Vytėnų geltonoji*
Strawberries	*Jaunė* *Nida* *Venta*
Black currant	*Kastyčiai* *Svyriai* *Vakariai*
Gooseberries	*Ginučiai* *Kirdeikiai* *Lūšiai* *Žilinai*

Table 5. Some actions from the National Environmental Action Plan

Actions	Timescale	Responsible organisations
Reduction of water contamination from agricultural and other non-point pollution sources		
Develop a legal document (norm) to limit the number of livestock area per unit	1996–1998	MA, MEP
Develop and implement plans for the utilisation of major livestock companies' waste water	1996–1997	MA
Perform an integrated non-point source agricultural pollution assessment and develop forecasting methodology	1997–1998	MEP, MA, LGS (MSUD)
Develop a waste minimisation programme for the Karst region in northern Lithuania	1997–1998	MEP, MA, M
Prepare and publish information on demonstration farm projects with optimal solutions to address problems of agricultural waste utilisation and non-point source pollution	1999	MA, MEP
Reduction of soil contamination with organic and mineral fertilisers and other agricultural chemicals		
Draft Soil protection law	1997	MEP, MA, MH
Develop soil quality and monitoring standards and norms	1996–1999	MEP, LGS (MSUD)
Prepare a study on the demand for new environmentally friendly soil fertilising and plant protection means in agriculture	1997–1998	MA, MEP
Preservation of Natural Resources, landscape and biodiversity		
Develop and adopt rules for the development of all territorial special environmental management documents	1997–1998	MEP
Develop methodology for the optimisation of land use structure	1997–1998	MA, MEP
Develop general (land management) plans of the national, counties' and municipal levels with consideration of nature frame structure	1996–2000	MCUD, RA, M
Develop nature frame schemes at local level for agrarian and urban areas, S 1:10000	1997–2000	M, MEP, MA
Develop methodology for agrarian farming lands classification into categories and for the implementation of anti-erosive agriculture system	1996–1998	MA
Develop methodological recommendations to minimise water-induced soil erosion and depletion	1998	MEP, MF
Develop schemes for agrarian farming lands classification into categories	1997–1999	MA
Renaturalise areas under economic activities	1997–2000	MEP, M
Develop soil data base	1998–2000	MEP, MA
Develop a planning scheme for the biosphere grounds of the karst region	1998–1999	MEP
Implement the Karst Region Preservation Programme	continuous	MA, Fund "Tatula"
Develop a compensation and privilege granting system (supplementary legislation) for people living in protected areas	1997–1999	MEP, MF
Develop and implement a national biodiversity preservation action strategy and a study on biodiversity	1996–2015	MEP

LGS – Lithuanian Geological Service
M – Municipalities
MA – Ministry of Agriculture
MEP – Ministry of Environmental Protection
MCUD – Ministry of Construction and Urban Development
MF – Ministry of Forestry
MH – Ministry of Health
RA – Regional Administration

Table 6. PHARE allocation for agriculture in Lithuania

1991 Financing memorandum – 1.47 MEUR

PROJECT	AMOUNT (EUR)	STATUS
1. PIU	300.000	Completed
2. Agricultural Sector Strategic Study	700.000	Completed
3. Training in Business Economy, Land Information, Business Planning	150.000	Completed
4. Food Aid Supervision Counterpart Fund Monitoring	120.000	Completed
5. Fishery Strategic Study	200.000	Completed
Financing memorandum allocation	1.470.000	

* **PIU** = PROGRAMME IMPLEMENTATION UNIT

1992 Financing memorandum – 0.6 MEUR

PROJECT	AMOUNT (EUR)	STATUS
1. PIU	300.000	Completed
2. Winter Cereals Production, Improvement of Technology	200.000	Completed
3. Hot House Strategy	100.000	Completed
Financing memorandum allocation	600.000	

1993 Financing memorandum – 5 MEUR

PROJECT	AMOUNT (EUR)	STATUS
1. Flax Cultivation, Improvement of Technology	400.000	Completed
2. Flax Industry, Scutching, Restructuring/Management	70.000	Completed
3. Rural Business Development	90.000	Completed
4. Agricultural Advisory Service	300.000	Completed
5. Land Information System	400.000	Completed
6. Cadastre Equipment	750.000	Completed
7. Hot Line Service Cadaster	50.000	Completed
8. Restructuring of Agri-Food Enterprises	700.000	Completed
9. Supply Vitamins/Minerals	1.250.000	Completed
10. Supply Mill Spare Parts	50.000	Completed
11. Supervise Poultry Feeding Programme	200.000	Completed
12. Cattle Breeding Programme	500.000	Completed
13. PIU Planning Assistance	100.000	Completed
14. PIU Planning Assistance	100.000	Completed
Financing memorandum allocation	4.960.000	

1994 Financing memorandum – 4.6 MEUR

PROJECT	AMOUNT (EUR)	STATUS
1. Grassland Management	1.000.000	Completed
2. Land Cadastration	554.72	Completed
3. Support to Agricultural Trade Agency	533.08	Completed
4. Banking and Rural Credits	1.000.000	Completed
5. PIU	1149.21	Completed
Financing memorandum allocation	4.237.01	

1995 Financing memorandum – 3.9 MEUR

PROJECT	AMOUNT (EUR)	STATUS
1. Land Reclamation – Phase I	324.721	Completed
2. Land Information Systems	384.045	Completed
3. Strategic & Management Assistance to LAAS	291.234	Completed
4. Human Resource Development	400.000	Completed
5. Agro-Industrial Restructuring – Part 2	325.000	Completed
6. Assistance to Flax Cultivation	175.000	Completed
7. Quality Laboratories	2.000.000	Completed
Financing memorandum allocation	3.900.000	

1996 Financing memorandum – 4.5 MEUR

PROJECT	AMOUNT (EUR)	STATUS
1. Loan Guarantee Fund	1.000.000	Completed
2. Institutional Support to EU Integration	700.000	Completed
3. Land Reclamation – Phase II	500.000	Completed
4. Cattle Breeding	400.000	Completed
5. Land Market Development	300.000	Completed
6. Agri-Service Centres	500.000	Completed
7. Assistance to LAITA	400.000	Completed
8. Quality Management	400.000	Completed
9. Rural Credit	300.000	Completed
Financing memorandum allocation	4.500.000	

1997 Financing memorandum – 2.6 MEUR

PROJECT	AMOUNT (EUR)	STATUS
1. Institutional Support to EU Integration	600.000	Completed
2. Loan Guarantee Fund	1.000.000	Completed
3. Equipment Procurement for Accession Priorities	250.000	Completed
4. TA for Technical Assistance Coordination Division	50.000	Completed
5. Monitoring and Support to RCGF	50.000	Completed
6. Assessment of Needs on Veterinary and Phytosanitary Control	150.000	Completed
7. Assessment of Needs on Animal Identification System	100.000	Completed
8. FADN and EAA	220.000	Completed
Financing memorandum allocation	2.420.000	

1998 Financing memorandum – 2.4 MEUR

PROJECT	AMOUNT (EUR)	STATUS
1. Veterinary and Phytosanitary Control	1.700.000	Undergoing
2. Integrated Farm Register and Agricultural Information System	700.000	Undergoing
Financing memorandum allocation	2.400.000	

1999 Financing memorandum – 4.5 MEUR

PROJECT	AMOUNT (EUR)	STATUS
1. Ensure Veterinary and Phytosanitary Border Control Measures	3.500 000	Launched
2. Modernisation of Rural Administrative System	1.000.000	Undergoing
Financing memorandum allocation	4.500.000	

2000 Financing memorandum

PROJECT	AMOUNT (EUR)	STATUS
1. Strengthening the Capacity of the Ministry of Agriculture and Related Institutions to Manage and Administer the EU Acquis for Agriculture (CAP) and Rural Development	2.000.000	Launched
2. Strengthening Lithuania's Capacity to Manage and Administer the Common Fishery Policy	1.500.000	Launched
3. Strengthening and Enforcement of EU Food Control System	3.000.000	Launched
Financing memorandum allocation	6.500.000	

2001 Financing memorandum

PROJECT	AMOUNT (EUR)	STATUS
Development of Animal Tracing and Epidemiological Surveillance System and Modernisation of Phytosanitary research and administration	3.000.000	Launched
Financing memorandum allocation	3.000.000	

Table 7. List of projects containing agri-environmental aspects in Lithuania

No	Projects	Project partners and financing institutions	Project co-ordinating organisations in Lithuania
1.	Improvement of the fertiliser normative-especially manure standards, phase 1, Republic of Lithuania 1997/98	The Danish Agricultural Advisory Centre (DAAC)	Lithuanian Institute of Agriculture
2.	Development of a Code of Good Agricultural Practices, Republic of Lithuania	DAAC	Lithuanian Water Management Institute (LWMI)
3.	Long-term assistance in the transposition and implementation of the Nitrates Directive	Danish Environmental Protection Agency (DEPA), Danish Ministry of Environment and Energy	Lithuanian Ministry of Environment (ME)
4.	Demonstration Watershed Activities to Reduce the Run-off from Agriculture and to Support Sustainable Agriculture in the Baltic Agricultural Run-off Action II Programme (BAAP) for Lithuania by BEAROP	Swedish University of Agricultural Sciences	LWMI
5.	Harmonisation of Legal Regulations of Lithuanian Water Resources Management with EU Regulations and Implementation of EU Requirements		ME
6.	Environmental Appraisal and Environmental Impact Assessment in Rural areas in the Applicant Countries	The Netherlands Ministry of Foreign Affairs and the Netherlands Ministry of Agriculture	Lithuanian Fund for Nature
7.	Implementation of Cleaner Technology in Lithuanian Slaughterhouses	DEPA, COWI Denmark	COWI Baltic
8.	Agri-environmental Programmes	Avalon, Veen Ecology and Institute for EURpean Environmental Policy; the Netherlands Ministry of Agriculture, Nature Management and Fisheries	Lithuanian Fund of Nature
9.	Ecologisation and Increased Efficiency of Agriculture in Lithuania	SIDA, SLU	University for Agriculture
10.	Project BALTICUM on Environmental Protection in Agriculture	DAAC	Lithuanian Agriculture Advisory Centre
11.	Inspection System for Organic Production and Trade	Danagro a/s	Certification organisation "Ekoagros"

4. Poland

4.1. Polish agriculture

Paweł Szabelak; *Warsaw*

4.1.1. The structure of agriculture in Poland

Before World War II agriculture in Poland was not very different from that in other European countries.

After the War big changes in land ownership took place in Poland, including dividing of some big privately owned estates into smaller farms, of a few hectares, the moving of many rural families from Eastern Poland (land taken over by the Soviet Union) to Western Poland (former German territory) and the Soviet '*farm collectivisation*' process, which did not succeed due to strong opposition from the Polish peasantry. As a result of this three-quarters of the land remained in the hands of individual farmers, which was exceptionally high among all socialist countries. Two general groups of land holdings existed at that time. One consisted of small private farms with fragmented and generally small fields and the second comprised large collective and 'state' farms. Both groups were inefficient as the structure and organization of socialist agriculture were incompatible with a market-oriented economy based on centrally prescribed production targets. As the Soviet-dominated system collapsed, market-oriented reforms started.

Agriculture remains important for the rural population in Poland. However, the future of the rural population is here considered in a broader context of rural development, including the creation of alternative jobs in rural areas that will facilitate the transfer of surplus agricultural labour without involving the undesirable option of rural-to-urban migration.

Market forces will probably continue to produce significant internal restructuring in the individual sectors, encouraging consolidation through transfer of land resources from very small units to more efficient medium-sized farms with commercial orientation and greater earning potential. Further restructuring of the sector is needed in order for Poland to be competitive in the market at the moment of joining the European Union as a full member country.

Land use and the organisation of production, in 1996, were as follows:

- The number of private farms (above 1 ha) in Poland was 2,041,400.
- The average farm size was 7.9 ha of which the utilised agricultural area was 7.0 ha.

Out of 2,041,400 private farms (above 1 ha) 49,400 (2.4%) are abandoned (not engaged in agricultural production on a permanent or temporary basis).

Out of the remaining private farms:

- 260,000 (12.7%) produce only for their own consumption;
- 764,400 (37.4%) produce mainly for their own consumption, occasionally selling any surpluses;
- 967,500 (47.4%) are involved in marketable production.

Within the group of agricultural holdings involved in marketable production, 72.5% of farm owners generate their income exclusively or mainly from agricultural production, whereas within the whole private agriculture sector the figure falls to 45.5%.

Over 90% of agricultural holdings involved in marketable production have 15 ha or more of utilised agricultural area. Out of the farms between 1 and 5 ha as many as 75% produce mainly for their own consumption, occasionally selling any surpluses. 3.8% are entirely abandoned (producing neither on a permanent or temporary basis).

According to the analysis, it is farm size which determines the type of farming, i.e. production mainly or exclusively for own consumption versus marketable production.

Table 4.1. The numbers and sizes of agricultural holdings in Poland

Agricultural holdings	1995	1996	1997	1998
a) in thousand	2,048.0	2,041.0	2,008.0	1,989.0
b) in %	100.0	100.0	100.0	100.0
utilised agricultural area				
1.01-1.99 ha	20.9	22.7	21.9	22.6
2.00-4.99 ha	33.7	32.7	34.4	34.0
5.00-6.99 ha	13.4	12.8	12.7	12.4
7.00-9.99 ha	13.3	12.7	12.3	12.3
10.00-14.99 ha	10.7	1.6	10.3	10.2
15.00 ha and more	8.0	8.5	8.4	8.5
Average farm size in ha	7.6	7.9	7.8	7.7
of which UAA, ha	6.7	7.0	6.9	6.9

Source: Central Statistical Office, Statistical Yearbook, 2000.

Farm size shows considerable regional variations – from 18 hectares in the North-West of Poland to merely 3 hectares in the South. In contrast, in the EU countries average farm sizes vary from less than 5 ha in Greece to about 70 ha in the UK.

Agriculture in the Polish economy

In Poland, there are 4.3 million people employed in agriculture, which accounts for almost 27.4% of the total employment, whereas the EU average for employment in agriculture is only around 5% of the workforce.

Agriculture is still an important sector of the Polish economy, though its share in GDP has been declining. It decreased from 11.8% in 1989 to 6% in 1996, 5.1% in 1997, 4.9% in 1998 and 3.4% in 1999. The share of agriculture in GDP in the EU is on average 1.7%.

Polish agriculture has to a large extent preserved its traditional character. The majority of farms have a mixed production pattern and apply extensive methods of cultivation. The use of mineral fertilisers in 1999 averaged 87.8 kg of NPK per ha. This is equivalent to the fertiliser use in Austria (where ecological methods of production are very popular) and is only a third of the corresponding figure for Holland. The use of pesticides in Poland is seven times lower than the OECD average.

Animal production is fragmented, with farms relying on producing their own fodder, including the use of permanent pastures.

Polish agriculture is not geared to intensive, specialised commercial production and therefore it has had a limited impact on the environment and landscape. The unspoiled rural environment, combined with a large surplus of labour, provides suitable development conditions for labour-intensive farming methods, and organic farming in particular. Some farmers will be able to expand into service industries (small trade outlets etc). Rural areas, in particular, may provide good bases for the development of tourism and agri-tourism.

Farm fragmentation constitutes a major weakness of Polish agriculture. It has multiple social and economic effects, results in low incomes for farmers and their fami-

Table 4.2. The agricultural output in Poland in 1999

Crop Types	in million PLN	in %
Grand total	**30,544.3**	**100.0**
Crop production, total	**11,929.3**	**39.1**
Cereals	3,143.0	10.3
Potatoes	999.1	3.3
Industrial plants	2,228.7	7.3
Vegetables	2,247.8	7.4
Fruits	2,714.6	8.9
Others	595.9	1.9
Animal production, total	**18,615.0**	**60.9**
Animals for slaughter	11,586.8	38.0
Milk	5,691.8	18.6
Eggs	1,168.3	3.8
Wool	6.0	0.0
Others	162.1	0.5

Source: Central Statistical Office, Statistical Yearbook, 2000

lies, and makes it impossible to accumulate investment capital for efficiency improvements. A farmer producing small quantities of different products thus finds it difficult to maintain product quality (this applies in particular in milk production) and to market them efficiently.

Animal production is traditionally the predominant activity of Polish agriculture. This sector has important investment needs, resulting from the necessity to adjust to EU standards in terms of competitiveness, product quality and environmental protection requirements.

Milk production in Poland

Compared to many countries of northern, southern and eastern Europe, natural conditions for milk production in Poland are very good; pastures and meadows account for 22% of total utilised agricultural area, which is lower than the EU average (39.3%), but higher than in Sweden (17.2%), Denmark (7.2%) or Finland (3.9%). Rainfall, conducive to grass production, is heaviest in the northern part of the country and in mountainous areas.

Dairy cows, along with beef cattle and calves, constitute 26% of the final agricultural output in Poland. As for cows' milk production, Poland would rate fourth among EU member states, with a production of 12.2 billion tonnes in 1998, following Germany (28.8 billion), France (25 billion) and UK (14.8 billion).

However, the milk production methods in Poland are extensive in nature. The average milk yield per cow dropped from 3,260 litres in 1989 to 3,015 litres in 1992. Since 1993 the milk yield has been increasing, going up to 3,477 litres in 1998.

Milk production is also very fragmented. Though 62% of Polish farms have cows, only 19.5% have at least 3 cows. This has a very negative impact on the quality of the milk produced and the economic production efficiency. However, a recent survey carried out by the Veterinary Inspectorate indicated that only 500,000 farms sell milk to dairies, while according to the Common Agricultural Census carried out in 1996, some 800,000 were involved in commercial milk production.

Pig meat production in Poland

In 1998, the pig livestock numbered 19,168 thousand, including 1,929 thousand sows. The pig livestock on private farms totalled 16,878 thousand heads including 1,675 thousand sows respectively. The value of commercial output accounted for 86.48% of the total value of pig livestock output in 1998.

Table 4.3. Breakdown of pig livestock according to the scale of production in 1998

Number of pigs per farm										
Total	1	2	3-4	5-9	10-19	20-49	50-99	100-199	200-499	Over 500 pigs
Share of farms with a given number of pigs										
100.0	0.3	1.3	2.2	5.5	14.9	30.5	19.6	12.7	7.2	5.8

Source: Central Statistical Office, crop area and number of livestock in 1998.

The development of fattener production will accompany the decline in the overall number of pig livestock as inevitably, the rotation will be accelerated and the meat conversion rate improved. Smaller farms will find outlets thanks to various forms of horizontal integration such as marketing co-operatives or groups.

Poultry production in Poland

The breakdown of poultry livestock production in Poland in recent years was as follows:

Table 4.4. Poultry livestock in thousand heads

Item	1999	
	Total	Including private farms
Hens	50,017	44,950
Including laying hens	43,386	38,905
Geese	608	728
Ducks	2,953	3,534
Turkey	672	684

Source: Central Statistical Office, the 2000 Yearbook, Warsaw, 2000.

Table 4.5. Poultry production (in thousand tonnes of livestock weight)

Item	1996	1997	1998	1999
Poultry produced on commercial poultry meat farms	435	535	635	700
- chickens	312	377	450	530
- selected hens	7	8	8	8
- turkeys	91	122	145	133
- ducks	5	5	6	5
- geese	20	23	26	24
Poultry from small scale farming	150	145	110	110
Total livestock	585	680	745	810

Source: Poultry and Egg Market. Diagnosis and Perspective. Estimates by the Institute of Agricultural and Food Economics. Warsaw, May 2000.

Poultry production is capital intensive. The risk is high and the profit margin is low. However, poultry production can be quickly adjusted to changes in the markets' requirements, as the production cycle is short and the range of products relatively wide.

Polish poultry producers will be able to adjust to the EU conditions thanks to increased efficiency of poultry production and reduced cost, as they will create vertical links (production contracts) as well as horizontal ones (marketing groups), which is of special importance in case of smaller producers.

Beef and sheep meat production in Poland

Traditionally, beef cattle production in Poland accompanied dairy cow production. At present only 500,000 calves (roughly just 15% of the total production) are predominantly meat breeds (by genotype). Consequently, beef production is mostly

based on mixed breeds or on dairy breeds. This leads to poor quality meat, not matching the increasing expectations of consumers. Additionally, expected future improvements to the dairy breeds are likely to reduce the quality of such mixed meat still further.

In the next few years farms are likely to specialise either in dairy or in beef cattle production. This will result from the growing consumer demands for improved quality of milk and meat.

Recently Poland has suffered a very serious decline in sheep production, from 5 million sheep in 1986 to 400,000 sheep at present. There are now conditions for a partial recovery in production, particularly as there is an increasing demand for sheep meat and the forecasts indicate a possible gradual further increase in internal demand. Poland has a good fodder base, which will also support expansion, especially in regions with unfavourable conditions for intensive agricultural production, such as uplands and highlands.

In addition, Poland has export opportunities in excess of the present production level as evidenced in its EU Accession quota not being fully utilised (30% utilisation).

Crop production in Poland

Out of the total area of Poland, the utilised agricultural area constitutes 58.9% of which arable land is 76.7%.

Cereal production is mainly in the central, North-Eastern and North-Western regions of Poland, which specialise in it. Potato production is very popular in the Central and South-Eastern vivoidships. Oilseeds are grown predominantly in north-western Poland and industrial crops, such as tobacco in southern Poland. Thanks to favourable soil, climatic and economic conditions, Poland is currently the largest potato producer and one of the four biggest rapeseed producers on the European market. At the same time, sugar beet has a significant share in traditional Polish crops. It is grown predominantly in the South-Eastern and North-Eastern regions of Poland. Because of soil and climatic conditions, fruit and vegetable production is located mainly in Central and South-Eastern part of Poland.

The main crops and yields in Poland between 1990 and 1999 are shown in Table 4.6.

Integrated farming is developing mainly among fruit-growers. In an organised fashion, integrated methods of fruit production* has developed since 1990. Presently the most developed is integrated apple production. In the year 1999 there were 1,007 fruit-growers using integrated methods on 8,700 hectares of land.

In 1998, the production of particular plants was as follows: cereals – 25.1 million tonnes, sugar beets – 12.6 million tonnes, potatoes – 19.9 million tonnes, rapeseed

* Farmers dedicated to integrated methods of fruit production are integrating biological and cultural control of pests into their production systems, using pest monitoring and economic action thresholds to advise the timing of chemical applications in order to avoid harmful effect on beneficial insect populations and natural environment.

Table 4.6. Crop production and yields

Crops	1990		1997		1998		1999	
	In thous.t	In dt/ha	In thous.t	In dt/ha	In thous.t	In dt/ha	In thous.t	In dt/ha
Cereals	28,014	32.8	25,399	28.5	27,159	30.7	25,750	29.6
Wheat	9,026	39.6	8,193	32.1	9,537	36.2	9,051	35.0
Rye	6,044	26.1	5,299	23.1	5,663	24.7	5,181	23.1
Barley	4,217	35.9	3,866	31.1	3,612	31.7	3,401	30.7
Oats	2,119	28.4	1,630	26.1	1,460	26.0	1,447	25.3
Triticale	2,721	36.3	1,841	29.2	2,058	32.4	2,097	31.8
Pulses for grain	609	19.2	260	17.9	289	19.4	317	21.2
of which edible	116	22.1	97	20.3	111	21.0	99	21.4
Potatoes	36,313	198.0	20,776	159.0	25,949	200.0	19,927	157.0
Sugar beets	16,721	380.0	15,886	379.0	15,171	379.0	12,564	338.0
Oil-bearing	1,233		611		1,121		1,157	
of which rape and agrimony	1,206	24.1	595	18.7	1,099	23.6	1,132	20.8
Feed root plants	9,724	472.0	4,763	409.0	4,743	423.0	5,423	385.0
Hay: from permanent grass land	14,384	59.6	13,450	51.8	13,307	53.1	11,245	45.6
from legumes	7,272	55.8	2,759	50.0	2,971	51.8	3,091	50.2

Source: Agriculture in the year 1999, Central Statistical Office, Warsaw, 2000.

and turnip-like rape – 1.1 million tonnes, vegetables – 5.2 million tonnes, fruits – 2.4 million tonnes.

Recent changes in the crop composition of farmland result from the demand for particular plant products and conditions constraining production (limited possibilities of introducing new technology), the decline in use of traditional methods and worsening climatic conditions in Poland within the last few years. Also, competition with European production has had a significant impact on the crop composition.

Organic farming

The beginnings of organic farming date back to the 1980s. In the 1990s this type of farming started to be treated as a separate sector. At present there are 405 organic farms in Poland with an EKOLAND, AGROBIOTEST or BIOEKSPERT certificate (firms and associations that have the right to regulate production standards and the quality of organic products in Poland) and 866 monitored farms are converting to organic production. These farms make up 0.6 per cent of the total number of agricultural holdings. In comparison, organic farms in the EU represent on average 2% of the total number of agricultural holdings. In Poland organic farms specialise mainly in agricultural crops. Cereals, oilseeds and potatoes make up around 66% of the total arable land of organic farms, meadows and pastures occupy about 27% of the total area of crops and organic fruit and vegetable growing constitutes 7% of the total arable land on organic farms.

At present 13 local processing plants are certified as organic. Since 1999 the State has being implementing a system of financial support for organic farms.

Table 4.7. Production of major products of food industry

Main products	Units	1985	1997	1998
I. Industrial primary processing				
Meat and fats (industrial slaughters)	thous. t	1,973.3	1,347.7	1,486.2
Industrially treated milk	thous. hl	52,376.4	19,934.8	19,460.5
Milled grain	thous. t	6,428.4	3,162.4	3,015.9
rflowSugar in terms of white sugar	thous. t	1,708.5	2,145.0	2,101.5
Rectified spirit in term of 100%	thous. t	267,988.6	133,470.9	112,611.8
Potato flour	thous. t	142.4	74.7	127.1
Fruit and vegetable must	thous. t	83,167.8	127,543.1	66,551.4
Frozen fruits	t	144,350.0	239,702.0	224,506.0
II Secondary processing				
Preserved meat (Total)	thous. t	111.9	140.8	143.5
Cured meat products	thous. t	692.5	944.5	887.7
Poultry preserved meat	thous. t	6.0	36.1	39.5
poultry cured meat products	thous. t	lack of data.	119.8	127.8
Cream	thous. t	363,719.0	200,535.0	194,639.6
Cheese	thous. t	113.0	158.3	163.5
Butter	thous. t	275.4	139.0	146.0
Flour	thous. t	3,508.2	2,440.5	2,402.2
Groats	thous. t	175.8	66.8	67.9
Spirit products pure and branded	thous. t 100%	179,532.0	110,369.3	93,717.6
Processed fruits including juices and non-alcoholic beverages	Thous. t	238.9 63.4	667.0 565.5	64.8 557.5
Edible vegetable fats	Thous. t	290.7	642.4	606.7
Margarine	Thous. t	173.0	394.5	309.0
Mineral waters and beverages	Thous. hl	lack of data	30,121.0	32,220.0

Source: Central Statistical Office, Production of Industrial Products in the year 1998, Warsaw July 1999.

The state of the natural environment in Poland

The Polish landscape features a high proportion of agricultural and forest land (almost 90% of the total area). Due to the post-glacial origin of soils and Poland's moderate climate, conditions for agricultural production are much less favourable than in other European countries. A relative index of climate and soil value amounts to 60–70 points*, compared to 100 points in Central Europe. At least 20% of the current total agricultural land area of Poland should be excluded from agricultural production and afforested or converted to natural conditions, because of low fertility. About 70% of soils are acidified and more than 50% reveal lack of phosphorus, magnesium and potassium. Only small areas suffer from excessive nitrate, as defined in the Nitrate Directive, and the problem is anthropogenic and mostly confined to particular farms, not to whole areas. The Ministry of Environment is involved in activities to determine the endangered areas and those suscep-

* The index is a sum of point scores calculated for soil class, climate, landform and water conditions of the area. The maximum score is 123 points.

tible to nitrate pollution risks, taking account of the concentration of animal production in Poland. The results of these are expected in 2001. Only 0.3–1.8% of soils are polluted by heavy metals to a degree that imposes limitations on agricultural production. In general the state of the natural environment can be considered satisfactory, however it does vary between regions.

Poland boasts high nature values, however there are again significant regional variations. Eastern and South-Eastern parts of Poland have well preserved nature, and strongly fragmented farms. This maintenance of traditional farming has allowed the conservation of valuable agricultural landscapes, with rich biodiversity and genetic resources of primitive crop varieties and domestic animals.

Highly differentiated topographies, with varying soils and climatic conditions, bring about a wide range of habitats and natural landscapes. There are some 370 types of plant habitats, half of which are on farm land. Marshes and peat lands retain their natural and semi-natural character, as have the extensive meadows and pastures located in the natural river valleys, and open-land shrubs as well as mountainous and xerotermic turf with numerous endemic species. The variety of local ecosystems in rural areas contributes to the stable existence of viable populations of some 100 species of birds. Many of these species are threatened with total extinction from Europe (e.g. white stork, corncrake). Poland has designated 128 bird habitats of national or European importance, which will be crucial to the application of Council Directive 79/409/EEC of 2 April 1979 on the protection of wild birds.

It is important to stress that Poland has a very well-developed system for nature protection, and 31% of all Polish land is designated as nature protection areas. There are 1,251 nature reserves (0.5%), 22 national parks (1.0%), 120 landscape parks (4.0%) which are under a strict nature conservation regime. More than 900 habitats according to CORINE criteria have been designated. It is estimated that total area of habitats of European significance cover around 20% of area of Poland. A large number of the designated habitats is located in areas outside nature protection areas. According to the Ministry of Environment, the existing nature protection systems and CORINE biotopes database will be fundamental to the creation of NATURA 2000 network (as required by Directive 92/43/EEC of 21 May 1992 on the protection of natural habitat and wild fauna and flora). NATURA 2000 network habitats occupy 10% of Poland's area.

Biotopes connected with agricultural land are threatened by the following:

- changes to traditional farming practices and intensification, especially in the case of feed stuffs produced for silage, however, the scale of such changes is not big yet,
- in some areas, abandonment of farming on pastures results in shrub succession and the disappearance of breeding habitat for wading birds,
- environmentally friendly agricultural technology is not widely used.

The forests and forestry sector of Poland

Forests take up approximately 28.2% of Poland's territory (8,813.1 thousand ha). Most of these are state forests, occupying 82% of the forested area. There are large

regional differences in afforestation density. In central Poland only 11% of the land is covered by forests. According to the state policy, by the year 2020 the share of forests in Poland is to increase to 30%. Afforestation is planned on the basis of the 'State Program for Woodland Increase' (SPWI), which will be updated this year. The main objective of the SPWI is to secure the afforestation of 700,000 ha. Afforestation will take place on State land (around 8,000 ha yearly) as well as on private land (similar area). So far the area of afforested private land is lower than had been planned. The SPWI is financed from the State budget, regional funds for environmental protection and water management and PHARE funds. Farmers receive grants for seedling purchase. Poor soils unsuitable for cultivation are to be used for this purpose. At present afforestation is conducted mainly on state land. Afforestation of private land is hampered by a lack of finance.

In 1998 the forestry sector employed 64,300 persons (84,100 in 1993). Total production amounted to 4,556.7 million PLN (out of which 3,404.3 million PLN were from the public sector and 1,152.4 private sector). Exports of timber and wood products reached 3,801,920.3 thousand PLN, while the corresponding figure for imports was 1,385,827.2 thousand PLN.

4.1.2. Coherent Structural Policy for Agricultural and Rural Development

The basic conditions, assumptions and objectives of policy, which is aimed at a permanent transformation of rural areas and agriculture, are set out in the ***Medium-Term Development Strategy for Agriculture and Rural Areas***. This document was prepared by the Ministry of Agriculture and Rural Development and was adopted as a government programme at the Ministers' Council meeting of the 21 April 1998. It was presented to the Polish Parliament on the 24 of April 1998.

The ***Coherent Structural Policy for Agricultural and Rural Development*** is a more detailed development of that part of the *Medium-Term Strategy for Agriculture and Rural Areas* which relates to structural and other changes of rural areas and agriculture within the period 2000–2006. The complementary programmes will include:

- implementation of phytosanitary and veterinary requirements,
- modernisation of agri-food processing,
- establishment of administrative structures required for the application of economic policy instruments in Poland which are compatible with EU systems. This means that agricultural support mechanisms covered by the CAP will be dealt with separately.

The *Coherent Structural Policy for Agricultural and Rural Development* assumes that structural changes in agriculture require transformations in rural areas. This goal will be achieved mainly by actions aimed at improving living and working conditions in the countryside. The policy takes into account the interactions between the effects of modernising agriculture, such as the displacement of agricultural workers, and a non-sectoral approach to rural development which seeks to increase employment in non-farm activities, such as non-agricultural production and services of all kinds, including rural tourism. The *Policy* considers agriculture to be just one of the possible economic activities in rural areas and a source of mainte-

nance for only part of the rural population. Public financial assistance for agriculture will consequently be directed at those who see most of their present work or their future life being dependent on farming (farm development). Such assistance will also be directed at restructuring such farms and thereby increasing their productivity.

As a governmental strategic document the *Policy* will be subject to assessment as regards its environmental impact. The starting point for this assessment should be revisions to the assumptions accepted in the *Policy* that the basis of rural development relies on the close interdependence between the economic utilisation of natural resources, improvement of rural living conditions and agricultural productivity, and both environmental and land planning policies.

This *Coherent Structural Policy for Agricultural and Rural Development* will be implemented by a number of operational programmes, including the SAPARD Programme (Community Support for Pre-accession Measures for Agriculture and Rural Development in the Applicant Countries of Central and Eastern Europe in the Pre-accession Period), PHARE, SPP programmes, Rural Areas Activation Programme and (after accession) Structural Funds and will be a starting point for choosing their priorities.

The Coherent Structural Policy for Agricultural and Rural Development has the following main structural targets:

1. **Creation of adequate working and living conditions in rural areas** so as to allow rural people to achieve their economic, educational, cultural and social potential.

   1.1. Development of physical infrastructure

   1.2. Improvement of social infrastructure in rural areas

   1.3. Better conditions for economic activities and job creation outside agriculture

2. **Restructuring the agrarian sector**

   2.1. Improved agrarian structure

   2.2. Instruments for farm modernisation

   2.3. Strengthening the position of farmers on agricultural product markets

   2.4. Implementation of biological improvement

3. **Sustainable development of rural areas, protection of the natural environment and cultural heritage**

   3.1. Support for investment in environmental protection

   3.2. Subsidies for farmers applying agricultural production methods designed to protect the environment

   3.3. Subsidies for farmers who plant trees on arable land

   3.4. Support to training and demonstration activities

3.5. Protection and promotion of rural heritage: folk art and handicrafts, as well as folklore and regional traditions

The details of how it is planned to meet these targets, and their numerous sub-targets, are given in Appendix 4.1.2

Based on the official materials and programmes, prepared by the Ministry of Agriculture and Rural Development and other relevant ministries and institutions, initial estimates of the policy costs have been made. In the period 2000–2006 the following investments are envisaged:

1. For construction of:
   - 200,000 connections to water systems,
   - 260,000 connections to sewage systems,
   - 800 collective and 180,000 farm waste treatment facilities,
   - 600 dumps,
   - 1.5 million new telephone connections,
   - 60,000 connections to the gas system;
- construction and upgrading of 80,000 km of farm and commune (local) roads;
- upgrading of 100,000 km of power lines;
- amalgamation and improvement on 340,000 ha of agricultural land;
- change in farm structure by granting preferences for land purchase of 550,000 hectares;
- implementation of biological advancement on 380,000 farms;
- early retirement payments for up to 30,000 farmers in the pre-accession period;
- support for 615,000 new jobs for rural dwellers (including graduates);
- afforestation of 200,000 hectares of land;

2. anti-flood and anti-drought investments by means of:
   - construction of 1,600 anti-flood dams,
   - 7,400 km of flood banks alongside rivers and canals,
   - 130 pump stations,
   - water reservoirs amounting to a total volume of 600 million cubic meters,
   - upgrading of drainage facilities on an area of 800,000 hectares.

In the pre-accession period the financial resources earmarked for the structural policies will be broken down as follows:

- resources of rural dwellers and business 20%
- resources of self-governmental authorities about 20%
- resources from the central budget about 45%
- additional resources from the European Community about 15%

The share of particular sources of finance for a specific programme shall vary and shall be defined in the operational programmes, in line with the EU rules and with Article 80 of the Law on Public Finance of the 26 of November 1998. It is foreseen that, after the accession of Poland to EU, the share of EU Structural Funds in the overall budget for the implementation of the structural policies will increase.

4.1.3. The Projection of the Budget for Agriculture for the year 2001

The projection of the budgetary law for the year 2001 takes into account enlarged expenditures on agriculture connected to the necessity of adjusting Polish agriculture to European Union standards in the pre-accession period.

In year 2001 expenditures will be concentrated on:

- Support of tasks to modernise agriculture, the food processing industry and rural areas, mostly in the form of subsidies for interest rates on preferential credits taken in the years 1994–2001;
- Implementation of biological progress in plant and animal breeding;
- Realization from the budgets of voivodes of tasks to improved rural infrastructure;
- Continuation of intervention in agricultural markets and in export of Polish products.

Expenditure on agriculture, realized by different providers, together with special purpose reserves, with funds from European Union (PHARE, SAPARD) and planned funds from the World Bank will reach a total of 21,266,046 thousand PLN, that is 11.67% of the planned State budget expenditure. Excluding funds from the European Union (1,131,126 thousand PLN), expenditure on agriculture will be of 20,134,920 thousand PLN, or 11.05% of State budget expenditure. In the projection of the State budget for the year 2001, expenditures on KRUS (The Fund for Social Insurance for Farmers) will increase up to 15,836,785 thousand PLN.

Total expenditure on agriculture, rural development, agricultural markets and on pensions for farmers in 2001 will reach 19,975,440 thousand PLN, which is 10.96% of State budget expenditure. In calculating these costs, expenditure on agricultural education and on maintenance of budgetary units working for agriculture were not taken into account, as they are financed, since the beginning of 1999, by a poviat's and voivod's local governments.

In the year 2001 expenditures on agriculture, excluding KRUS but together with funds from the EU and World Bank, will be higher than foreseen in budget for the year 2000 by about 18.7%.

In the budgetary law parts 32, 33 and 35, allocated from the Minister of Agriculture and Rural Development, there are foreseen expenditures in sum of 3,135,324 thousand PLN.

In part 32 the following tasks will be financed:

- biological progress in plant and animal production,
- spreading of the agricultural extension service,
- subsidies for liming fields,
- crop protection,
- organic agriculture,
- quality control of soils, agricultural and alimentary products.

In the scope of this part there are planned also expenditures on:

- interest rate subsidies on credit for agricultural aims,
- interest rate subsidies on credit for deep sea fisheries,
- costs of catch quota for deep sea fisheries,
- Central Agricultural Library, tasks on national defence and other important tasks connected with agriculture,
- tasks from a range of agricultural education projects,
- stocking of Polish sea areas,
- expenditures connected with functioning of Minister's Office of proper minister of agriculture, with European integration, foreign relations,
- expenditure related to maintenance of sea fishery inspectorates and expenditures of Agricultural and Food Quality Inspection.

For part 33 – Minister's Office of minister proper for rural development – there are foreseen expenditures at the level of 1,801,175 thousand PLN, for the Agency for Restructuring and Modernization of Agriculture on statutory activity, on functioning of Minister's Office of Minister proper for rural development, spreading advisory service in range of rural development and on integration with European Union and international co-operation covered by this budget part.

Expenditures on statutory activity by the Agency for Restructuring and Modernization of Agriculture in the year 2001 are higher than was provided for in 2000 by about 56%.

In the scope of part 35 – Minister's Office of minister proper for agricultural – market expenditures totalling 649,821 thousand PLN will be realized. From this fund will be financed; the activity of the Agricultural Market Agency, activity of the Inspection for Purchase and Processing of Agricultural Products, monitoring of accessibility of Polish agricultural products to foreign markets and scale of importation, expenditures connected with activity of Minister's Office of minister proper for agricultural markets, integration with European Union and foreign relations.

In projection of the budgetary law for the year 2001, general expenditures in budgets of voivodes in division 010 – Agriculture – are planned at 643,905 thousand PLN.

Apart from budget of Minister's Office of minister proper of agriculture, of rural development and agricultural markets and budgets of voivodes, there are planned expenditures covered by other budget parts on interest rate subsidies on credits for agriculture taken since 31 December 1993, for The State Agricultural Property Agency on exchange of land from farmers for retirement pension and disability pension in favour of the State Treasury and expenditures within special purpose reserves.

In 2001 the Minister of Agriculture and Rural Development will be entitled to apply to start special purpose reserves for:

- fighting infectious diseases of animals, which one can not foresee when constructing the budget,
- undertakings defined in Rural Development Programme (financed from the World Bank Loan),

- co-financing of SAPARD programme (out of sums provided for this aim in expenditures for Agency for Restructuring and Modernization of Agriculture), co-financing of Rural Development Programme and financing of activity of Agricultural Chambers at the beginning of the year 2001.

In the project of the budgetary law for the year 2001 there are included funds originating from European Union on realization of PHARE programmes and the SAPARD programme.

Expenditure provided for agriculture in the projected budgetary law for the year 2001 enables continuation of process of restructuring and modernization of agriculture and of structural transformations in the rural areas, and also will permit acceleration of the process of implementing European Union legislation.

4.1.4. The Pact for Agriculture and Rural Areas

The Pact for Agriculture and Rural Areas was prepared by the government of Poland in co-operation with social partners representing various circles (milieus) of rural areas. Medium and long-term actions foreseen in the Pact are directed not only towards agriculture but also other fields important for the improvement of living conditions in rural areas.

The Pact represents a multi-annual programme for agriculture and rural areas, which will enable preparation for integration with the European Union, ensure the adequate performance of Polish agriculture and absorption of potential opportunities resulting from CAP and Structural Policy after the accession of Poland to the EU. Solutions proposed in the document will be the basis for the Council of Ministers and the Parliament to formulate the multiannual programme in line with the Polish law concerning public finances. The programme will indicate, in the following years, the budget expenditures and public bodies responsible for realization and coordination of each task included in the programme.

The effort of the government to implement a broad programme of development of rural areas is a multi-sectoral task, which requires the full co-operation of many key departments of public administration, local self-governments, farmers organizations, employers, trade unions and other social and economic partners.

The activities dedicated to rural areas apply to agriculture but are not only agricultural. Therefore, the Pact for Agriculture and Rural Areas is based on four mutually inter-dependent pillars. The total State Treasury expenditures dedicated for the Pact's implementation (excluding local governments budget, NGOs, private sources) are respectively:

I. Support for agriculture and its environment: 3,295,332 thousand PLN in 2001 and 6,080,764 thousand PLN in 2002;

II. Development of entrepreneurship and the creation of non-agricultural jobs. 3,734,271.7 thousand PLN in 2001;

III. Support for a complex social policy for agriculture and rural areas, and the improvement of living conditions in rural areas. 562,179 thousand PLN in 2001;

IV. Institutionalisation of partnership and social dialog about agriculture and rural areas. 5,000 thousand PLN in 2001.

Details of the activities, instruments and supports envisaged under each pillar are given in Appendix 4.1.4.

4.1.5. The SAPARD Operational Programme for Poland

The basis for the formulation of the SAPARD operational programme is the *National Programme of Preparation for EU Membership* (NPAA) which identifies, among others, the priorities for agricultural and rural adjustment for pre-accession. These include the formulation and implementation of a coherent policy for rural development and agriculture, veterinary and phytosanitary law and administrative structures, modernisation of some food sectors (dairy sector, meat sector, fruit and vegetable processing), environmental aspects of agriculture, and the preparation for CAP implementation.

The Coherent Policy for Rural Development and Agriculture adopted by the government of Poland in July 1999, as a fulfilment of the NPAA commitments, identified the following main policy objectives:

- creation of adequate working and living conditions in rural areas so as to allow rural people to achieve their economic, educational, cultural and social potential,
- restructuring of the agricultural sector by putting in place conditions for the adaptation of agriculture to the changing economic and social situation, and
- sustainable development of rural areas, protection of the natural environment and cultural heritage.

The implementation of the above objectives requires long-term intervention and considerable financial commitment. In formulating its strategic objectives for rural development and agriculture, Poland's readiness for EU accession as of 1 January 2003 has been taken into account.

The Ministry of Agriculture and Rural Development has prepared this Operational Programme in line with Council Regulation No 1268/99.

Following analysis of the existing situation in rural areas and in the agri-food sector it has been decided that the SAPARD Operational Programme for Poland will be based around two balanced priority axes: *Improvement of Agri-food Sector Efficiency*, *Improvement of Business Conditions and Job Creation and Complementary ax*is. In line with the Council Regulation No 1268/99 the planned measures aim at achieving the strategic objectives of the SAPARD Programme in Poland. They are:

- to improve the competitiveness of the Polish agri-food sector, both domestically and internationally,
- to adjust the agri-food sector to safety, hygiene and food quality and environmental standards in line with the *acquis communautaire,*
- to stimulate the multifunctional development of rural areas by supporting the development of technical infrastructure and boosting business activities outside of traditional agriculture.

SAPARD is the first programme fully based on the Structural Funds of the European Union and its monitoring, compliant with the EU rules, will be a new task for the Polish administration. Seven measures, described in the aid schemes, are envisaged to achieve the above objectives.

The Ministry of Agriculture and Rural Development is the responsible authority (Managing Authority) for general co-ordination and implementation of the SAPARD Programme in Poland. The Minister of Agriculture and Rural Development has appointed the Agency for Restructuring and Modernisation of Agriculture as the SAPARD Agency.

As stated in the Council Regulation No 1268/99 the Operational Programme covers the period 2000–2006. During its first stage, covering years 2000–2002, the Programme will focus on preparing the agri-food sector for the *acquis communautaire*. Following accession, the measures planned within this Programme will be transferred to the operational programmes of the EU Structural Funds, in particular to the EAGGF Guidance Section and programmes financed from the EAGGF Guarantee Section.

In accordance with Council Regulation No 1268/99, the SAPARD programme is planned to run until 2006. However, the government of Poland has announced that Poland plans to be ready for EU membership on 1 January 2003. Thus, Poland will apply for extending both the scope of structural intervention (e.g. by an early retirement scheme) as well as the amount of funding from the Structural Funds (co-financed from the national funding) in line with the EU structural policies legislation and with the programmes financed by the FEOGA Guarantee Section.

There are two Priority Axes and a Complementary Axis under the SAPARD Operational Programme for Poland, each having various Measures and Schemes to allow their implementation. Details of the Measures, including their aims, scope (both geographical and eligible persons) and outlines of the levels of aid per grant are given in Appendix A. Updated details will be published by Ministry of Agriculture and Rural Development. Additional information can be found on the internet under ***www.minrol.gov.pl***. Briefly the three priority axes aim to:

- improve the economic viability of the Polish agri-food sector in both domestic and international markets,
- adjust the Polish agri-food sector to sanitary, hygiene and quality standards of the Single Market, and
- encourage multifunctional rural development, especially via developing technical infrastructure and creating conditions for non-agricultural economic activities in rural areas.

Each 'Axis' has a number of funded grant types: outline details, including eligibilities, are given in Appendix 4.1.5.

The proposed Total budgets for these SAPARD schemes are summarised in Table 4.8 below, which breaks down the proposed contributions into National and EU sources.

Table 4.8. Overall financial table for SAPARD programme (in EUR)

Years	Total Cost	Total public expenditure	EU support		National public financing					Private contributions
					Total national		Central government	Region	Others	
				%		%				
1	**2 3+11**	**3 4+6**	**4**	**5 (4/3)**	**6 8+9+10**	**7 (6/3)**	**8**	**9**	**10**	**11**
2000	358,039,063	227,732,865	171,602,514	75.35	56,130,351	24.64	56,130,351			130,306,198
2001	367,838,672	227,659,337	171,602,514	75.37	56,056,823	24.62	56,056,823			140,179,335
2002	386,705,339	227,659,338	171,602,514	75.37	56,056,824	24.62	56,056,824			159,046,001
2003	387,438,671	227,659,337	171,602,514	75.37	56,056,823	24.62	56,056,823			159,779,334
2004	386,975,338	227,659,337	171,602,514	75.37	56,056,823	24.62	56,056,823			159,316,001
2005	386,408,671	227,659,337	171,602,514	75.37	56,056,823	24.62	56,056,823			158,749,334
2006	385,795,339	227,659,338	171,602,514	75.37	56,056,824	24.62	56,056,824			158,136,001
Total	**2,659,201,093**	**1,593,688,889**	**1,201,217,598**	**75.37**	**392,471,291**	**24.62**	**392,471,291**	**0**	**0**	**1,065,512,204**

4.1.6. Summary of the Polish Rural Development Program

The project is designed so that individual elements from any component can be implemented at the local level, singly or in combination with others. For example, a gmina may identify the need for investment in a waste-water treatment facility, training for several unemployed people in business management, and a credit system to help an entrepreneur start a small business. A package of services and investments will be developed to meet those needs, drawing on resources across all project components. Such packages will form part of the broader investment program submitted by gminas to the regional authorities for co-financing.

The following are the components and sub-components financed under the project:

Component A: Micro-credit (20.71 million EUR*)

This component is centered on the development of micro-enterprises. Its objective is to reduce hidden and registered unemployment in rural areas, while also allowing an empirical comparison of the micro-credit approach with the cost of the current regime of social assistance (welfare). In particular, the component will promote off-farm self-employment in the rural gminas of five voivodships. To achieve its objective, the component will finance: (a) small, one time only grants to for individuals to cover the costs of capital equipment which will enable them to start economic activity (to become self-employed). This will allow for a wider participation to the micro-credit program; (b) micro-loans up to 5,435 EUR to new and existing rural micro-enterprises; (c) advisory services for newly established micro-enterprises created under the component; and (d) operational costs and technical assistance on micro-lending to non-governmental organizations or financial institutions which will be selected to assist in the implementation of the component, as service providers. The service providers will enter into a legal agreement with the National Economy Bank (BGK). This agreement will cover the terms and conditions for the operations of the micro-credit programs, including risk sharing, and the conditions for technical assistance and training.

Component B: Human Capital Development

Sub-component B-1: *Labor Redeployment* (48.74 million EUR). The objective of the sub-component is to assist the economically disadvantaged in rural communities to expand and use their human capital in response to economic and labor market opportunities. The sub-component will finance two main tasks: (i) economic and labor market surveys; and (ii) labor redeployment services, such as specialized employment services, on-the-job and institutional training, support to temporary community employment, small business assistance services, small business incubators, promotion activities and local economic development planning grants. The menu of labor redeployment will be made available to economically disadvantaged and unemployed citizens in rural communities, through local service providers which will be selected on a competitive basis.

Sub-component B-2: *Education* (26.82 million EUR). A key component in the effort to attract new businesses in rural areas is the implementation of a comprehensive

* 1 EUR = 0.92 USD.

program for the development of a strong education and training system, capable of providing graduates with the level of knowledge, skills and capacity to learn required by a modern market economy. The overall objective of the education sub-component is to improve the efficiency of the education system and the quality of graduates, in target gminas, by enhancing the quality of teaching in rural primary and secondary schools and grammar-schools and improving the utilization of educational resources. The education sub-component will finance five major activities: (i) a program for improving the quality of teaching in primary and secondary schools and grammar-schools in target areas through training; (ii) a program for improving the quality of school equipment through the provision of instructional material; (iii) a program for supporting the introduction of computers for instructional purposes in rural gminas; (iv) a program for improving school facilities, and education efficiency, through activities leading to the consolidation of the school network; and (v) support to project dissemination, implementation and monitoring. The project will be implemented in a sub-set of gminas covered by the project, based on an assessment of the current situation of their education system. Gminas will select from the above menu a combination of investments which addresses the main problems and challenges identified during the assessment.

Sub-component B-3: *Institution Building in Local and Regional Administrations* (13.72 million EUR). The overall objective of this sub-component is to increase the level of efficiency and effectiveness in eligible units of local and regional administration (gminas, poviats and voivodships) within the voivodships covered by RDP, through institutional development, training programs, and capacity building measures, thus improving the conditions for the creation of non-farm employment in rural areas. An efficient public administration will improve the provision of goods and services to the public and the private sectors, thus facilitating economic activities. The project will finance: (i) institutional development programs (IDP) in selected pilot units to develop a framework for improving the general efficiency of regional and local administrations, including management of human and financial resources; (ii) training programs to improve the quality of services delivered by local officials and public servants, and build capacity for implementing EU rules and regulations; and (iii) and a capacity building program aimed at supporting the Ministry of Interior and Public Administration in linking IDP and training activities, and at developing surveys and studies. Training will be provided to selected public officials, i.e. elected councilors and board members, and employees of different levels of local government administration. The training will place special emphasis on public management and administrative services important for the successful implementation of RDP and its project components.

Component C: *Rural Infrastructure* (211.84 million EUR)

The development and improvement of infrastructure is regarded as a prerequisite for stimulating private sector development. Areas with developed infrastructures attract investors, whereas areas with inadequate infrastructure place a burden of additional costs on potential investors, who may need to build roads, water supply, waste water collection, access to district heating, telecommunication, etc., in order to start and operate a new business. The objective of this component is to improve technical infrastructure in rural areas, in order to stimulate private sector

investments, facilitate the creation of non-farm jobs, improve environmental and health conditions, introduce alternative organizational and institutional structures for the sustainable delivery of affordable services, introduce market oriented approaches in the development and operation of infrastructure networks, and finally narrow the gap between rural and urban areas in economic development. The project will finance water supply systems, sewage collection and treatment facilities, solid waste management systems and rural roads. The limitation to investments in the water, waste water, roads and solid waste sectors is based on the low demand expressed by local governments for telecommunication and energy projects. High priority sub-projects have already been identified by the local governments in seven voivodships. Proposals for investments in rural telecommunication were only 0.8 per cent of the total investment portfolio, and eligible energy projects were only 1.3 per cent. The average size of a rural infrastructure investment financed under the RDP is expected to be 500,000 EUR. The sub-projects will be further screened and evaluated during implementation, according to technical, financial and institutional requirements. A comprehensive training and technical assistance program has been developed to provide technical staff, project staff in the voivodship and local government officials, with the skills necessary to implement the project.

Component D: *Project Management* (4.09 million EUR)

The project will also finance the costs of a Project Coordination Unit (equipment, staff and O&M), and a provision is made for the costs incurred by the project teams in the line ministries and the Voivodships' Project Implementation Units.

4.1.7. The Rural Environmental Protection Project

The National Fund for Environmental Protection and Water Management has launched a pilot program to promote environmentally sound agricultural practices among Polish farmers. The program will provide environmental advice as well financial support to farmers for on-the-farm investments (e.g. manure and silage storage facilities, buffer strips along the edge of sensitive water bodies and newly constructed wetlands) that will promote environmental considerations in agricultural development.

The program will consist of two phases. During the first phase, a pilot study will be conducted among the farmers and farming communities in three areas: around Elbląg; Toruń and Ostrołęka; and Łomża. These areas were chosen because they are characterised by significant levels of nitrate soil pollution, and they are also representative of the different farm and soil types in Poland (and well distributed within it). Successful implementation of the program and its successful demonstration to the farming community at large should lead to the second phase of the program, an expansion of these environmentally sound agricultural practices into other parts of the country.

The project will have two components. The first involves on-farm environmental improvements, including environmental advice to eligible farmers and financial support for the recommended on-farm investments. The second involves public awareness, public outreach and project management. The public awareness and

outreach program aims to widen understanding of the importance of environmental issues in agriculture especially within the group of 1,000 households to be covered by the pilot project, as well as targeting the overall Polish farming community and the wider public. These outreach programmes are to be coordinated with regard to both the design and the implementation of the program with representatives of the ministry of Environment, Ministry of Agriculture and Rural Development, Chambers of Agriculture, and other governmental and non-governmental organisations concerned with agriculture and environmental issues.

In order to support the first phase of the program, the National Fund for Environmental Protection and Water Management has developed a Rural Environmental Protection Project. The Project will be supported by a number of foreign donors as well as the Government of Poland and the National Fund. The World Bank will lend 2.72 million EUR to the National Fund. This amount will be accompanied by substantial grant funding, including a 3.26 million EUR grant from the Global Environmental Facility (GEF), 1.09 million EUR from the Nordic Environmental Finance Corporation (NEFCO) and approximately 4.02 million EUR from the EU (PHARE). The total cost of the project will be 17.17 million EUR.

4.1.8. The agricultural policy in Poland

It is expected that short and long term agricultural policy will be dominated by the preparations for the integration of Poland's agriculture into the European Union.

Following the most important strategic documents (*The Pact for Agriculture* and *Coherent Structural Policy for Agriculture and Rural Development*) work on improving competitiveness and working conditions in agriculture, preparation of Poland's integration into the European Union and improvement of the viability of the socio-economic fabric of rural areas will be continued.

In the context of continuous decline in farm incomes, the Polish government will continue with intervention in the agricultural markets.

Development strategy to improve the competitiveness and capability to adapt the organisation and regime to the Community requirements will be implemented (for example in the milk sector).

The pace of adoption of agriculture-related laws will have the priority in the very near future. Adjustment of procedures will be done in the designated institutions (ARMA, AMA) for final enforcement of instruments according to Community rules.

In the area of rural development and forestry the SAPARD programme will finally be launched.

Agriculture plays an important role in the maintenance of biodiversity and landscape.

According to the directions for Agricultural Policy stated in *Coherent Structural Policy for Agriculture and Rural Development,* all activities and measures taken in the future development of Polish agriculture will be based on the sustainable development of rural areas, including conservation of both natural resources and the cultural heritage.

Therefore to enhance environment protection in agriculture, the following measures are envisaged:

- Investment support to reduce the negative impact on the environment, including: construction and renovation of facilities for the utilisation of municipal and farm wastes, construction of small sluice gates and small water reservoirs, afforestation;
- Support for farmers adopting environmentally friendly production methods (as compensatory payments);
- Subsidies for farmers converting arable land (on poor soils) into forest, in the form of partial co-financing of afforestation activities for five consecutive years;
- Training activities and demonstrations, as well as education at the school level, relating to dissemination of Good Agriculture Practice codes, methods for biodiversity maintenance at a farm level, and environmentally friendly production methods.

The rural demographic structure is pivotal in determining the direction of state policy, the main objectives of which are to support the development of the employment market and the provision of adequate education.

The reform of tertiary education (post secondary school) will introduce major changes into the agricultural education system.

As regards training for the youth in environmental protection issues, the block of general education subjects, which are obligatory for all types of job, includes *Protection and management of the environment* or *Biology with hygiene and environmental protection elements,* whereas the block of vocational subjects, e.g. for technician of environmental engineering and land improvement includes *Ecological basis of environmental protection*. In addition, environmental protection and management aspects are included in specialist subjects such as *Organic farming, Protection of horticultural plants, Organic horticulture, Management and cultivation of green amenities*.

Furthermore, within the framework of environmental protection activities, various competitions for pupils are organised, e.g. 'Ecological Knowledge Competition', 'Environmental Protection Competition'.

4.2. Plants

Wiesława Podyma; *Breeding and Acclimatization Institute in Radzików*

4.2.1. Biodiversity

The agricultural fields, which cover about 60% of the country (18,650,000 ha) are subject to intensive processes which affect the preservation of biological diversity. Recent years have seen agriculture transformed to meet to conditions of the market economy. In the initial phase, there were setback in many sectors of agricultural production which manifested themselves in, amongst other things, a decline in the use of mineral fertilizers and plant protection agents. It is possible to distinguish agricultural regions that are highly developed, and areas of much lower productivity. Fields are also being left fallow more frequently and this, together with the abandonment of marginal land is reducing the land's biodiversity. Family farms covering just a few hectares and with limited capital are dominant (80% of farms cover less than 10 ha). These have traditional methods of management and are of low productivity. It has been estimated that only 30% of them meet European standards, although this is a favourable situation from the ecological point of view, as it has allowed many areas to retain high biological diversity in both the agrocenoses themselves and in the agricultural space as a whole.

4.2.2. Indigenous plant genetic resources

Flora of Poland

The Polish flora contains over 2,300 species of seed plants (*Spermatophyta*) classified into 730 genera and 120 families (Pawłowska, 1972). The proportion of trees in our flora is small, especially when compared to the warm climate zone, and amounts to 2%. Shrubs constitute 7% of species, the rest are herbaceous plants.

The number of endemic species in the Polish flora is small; 59 endemic and sub-endemic species have been recorded. The cause of this paucity is the lack of the natural barriers separating Poland from the east and west. On the other hand the flora and fauna were destroyed by the Pleistocene glaciations (Pawłowska, 1972). The majority of endemics occur in the mountains. They are related to the Carpathian ridge and are often recorded in other countries bordering these mountains.

Besides the endemic species, the relict ones are of high importance to biological diversity. These kinds of species show narrowly defined environmental requirements, related to their origins, as they are more threatened than the species with broad ecological tolerance.

In Poland during the two last centuries, 124 plant species have become extinct or retreated from their localities, including 29 species of seed plants (*Spermatophyta)*. The other 30 seed plants are endangered. However, over the same period, at least several hundred species colonised Poland or were introduced by man. By evaluating the anthropogenic changes in the Polish flora it is noteworthy that the native species make about 68% of seed plants, the rest being exotics. Almost 16% of alien species are archaeophytes. A remarkable proportion of them are at serious risk of extinction due to recent alterations to traditional farming methods.

The present-day composition of our flora is a constantly changing, dynamic set of species of different origin, which colonised in different periods. This makes it diffi-

cult to define the level of changes that happened. On the "List of plants endangered in Poland" (Zarzycki, Szeląg 1992) figured 418 species, viz. 19% of the flora. In the western countries this proportion exceeds 30% (Landolt, 1991).

The Polish ecosystems (both natural and agricultural ones) have been subjected to less intense genetic erosion than in other European countries.

Wild and crops-related species

The full list of wild ancestors of the important crops is difficult to complete. Generally, Poland is not a region rich in such species. The wild ancestors of the most popularly cultivated plants do not occur in Poland. The green fodder plants (grasses, pulses) were bred immediately from the native ecotypes.

Within Poland the ancestors of cultivated plants of *Prunus* genus do occur. *Prunus fruticosa* - a progenitor of *Prunus cerasus* and *Prunus avium* - grows here on the western border of its range. There are also wild populations of *Prunus spinosa* and *Prunus insititia,* which have contributed to the origin of *Prunus domestica*. Other species representing the gene pool of *Prunus* occur, such as the montane species *Prunus padus* L. ssp. *borealis*.

Lactuca serriola — a lettuce progenitor — is present as a common plant of both uplands and lowlands. In Silesia *Lactuca saligna* occurs, which belongs to the same crop gene pool.

Many indigenous species of important drug plants are spread widely in their natural locations, e.g. *Achillea millefolium*. There are also some well adapted foreign ones too, e.g. *Acorus calamus*. Some of these species are in danger of extinction, e.g. *Allium scordoprasum, Iris sibirica*.

Another group is constituted by the species that have lost their former economic importance and were reaped from natural stands in the past. *Trapa natans* is an aquatic plant which previously inhabited a wide geographical range and its fruits were used as a starchy food. Now it is very rare in Central Europe. In Poland it occurs on the south-eastern border. The subspecies *T. natans* var. *convicarpa* has not been found recently and may be locally extinct.

A majority of the native plants' variation has been used on a limited scale or never exploited, eccept as fodder plants. Populations of grasses of *Alopecurus* and *Bromus* genera and pulses *Coronilla varia, Medicago lupulina, M. falcata, Anthyllis vulneraria, Trifolium medium, T. fragiferum* are a potential source of biological diversity for agriculture. There occur also a group of wild species which could be used as ornamental plants, e.g. *Azalea pontica* (locations near Leżajsk), *Scilla bifolia*, *Leucoium vernum* var. *carpaticum* (Bieszczady), *Telekia speciosa* and *Dendranthema zawadskii*.

The causes of various plant groups dying out are usually very similar. It is, first of all, destruction of the whole ecosystems by urbanization, industrialization and by an increase of the cultivation area (Zarzycki, Szeląg 1992). The degradation caused by minor changes in water and soil moisture, sometimes so subtle as to be hard to notice, results in increased danger and loss for, first of all, the water, peat-bog and swamp ecosystems.These communities are the refugess of many rare and highly specialized plant species (Jasnowska, Jasnowski, 1977). Disturbance of the balance between ecosystems, and changes in the areas occupied by plant populations led to the immediate contact of related but distinct taxons and stimulated their inter-crossing (Zarzycki, Szeląg 1992). It became the cause of impendence for

numerous populations of a steppe cherry *Prunus fruticosa*, which forms hybrids with the popularly cultivated sore cherry (Wójcicki, 1991).

The species recognized as threatened and close to extinction are included into the "Red list of the vascular plants endangered in Poland" (Zarzycki, Szeląg 1992) and into "Red book" (Zarzycki, Kazimierczakowa 1993). Some of them are protected by law. The important areas are protected as national parks and sanctuaries. Since 1994, preparatory research has been conducted on monitoring these threatened plants (Zarzycki, 1994). There is a need for financial support for both research work and for practical local measures to maintain the particularly interesting and important plant populations.

Local domestic varieties and old cultivars

The great changes introduced into agricultural systems after World War II acted as a powerful leveller, and simplified the way food was produced and exchanged. As a result, local domestic varieties have disappeared from most sites in Europe and genetic erosion is still in progress. Traditional (extensive) agriculture did not survive in the major agricultural regions where big areas of different new modern cultivars were introduced. The loss of local domestic varieties has been caused by the spreading of modern varieties into eastern European countries (where the past collectivisation policy is considered to be the major cause of it) as well as in western countries (as result of industralisation of agriculture).

Field crops

Poland is a unique example of a country in Central Europe, where the old local forms of crop plants survived owing to the "fragmented" structure of farming. 70% of agricultural lands was in private hands even during the communist period. This allowed the continuation of traditional methods and indigenous knowledge. The main areas of their occurrence are situated in the southern part of the country and include the montane regions of Beskidy, the Tatra mountains and their foothills. Minor refugial regions have been discovered in eastern and south-eastern Poland, in Podlasie and in the basin of Sandomierz. The harsh climate, short growing period and undulating surface are characteristic for these regions. These geographic, ecological and cultural factors favoured the local *varieties* (geographical isolation, unsuitable conditions for industrial production methods, infra-structure, tradition). It should be emphasized that the local races compete successfully with the new varieties in these regions. Well adapted to the specific environmental conditions, they guaranteed not high, but stable yields even in unfavourable years. These regions are characterized by the cultivation of some relic crops, e.g. false flax (*Camelina sativa)*, oil radish (*Raphanus sativus* var. *oleiformis)*, millet (*Panicum miliaceum)*. Expeditions also documented examples of active breeding programmes by farmers for these species, e.g. on the Vetch (*Vicia dasycarpa*), which was selected for fodder purposes from weedy populations of the species.

At the present moment the local crop cultivars are available mainly as the materials stored in gene banks. According to our evaluations the local populations of crop plants disappeared almost completely only in the last decade. Only in a few regions can local populations still be found. In agricultural crops such as potato, old obsolete varieties such as 'Alma', 'Early Rose' or 'Wanta' were cultivated until recently in south-eastern Poland. Our institutions that are engaged in the trade, testing and control of seed material reported that local cultivars of timoty, clover

and old varieties of clover ('Hruszowska' and 'Podkowa') are still grown by farmers. The alfa-alfa landraces 'Gubińska' and 'Miechowska' are another example of a local races which have been widely cultivated for some time in Poland. Local races of spring rye and barley are still grown at high altitudes in mountains.

The modernization of Polish agriculture, resulting in the exclusion of marginal areas from cultivation and the wide availability of new varieties of seeds are menacing populations of all local crop varieties (see Table 4.9).

Table 4.9. Neglected and rare species of crops in Poland

Name	Botanical name	Varieties	Value
False flax	*Camelina sativa*	Landraces	Neglected species, suitable for very poor soils, increase of diversity in agricultural systems
Strigosa oat	*Avena strigosa*	Landraces	Neglected species, suitable for very poor soils, increase of diversity in agricultural systems
Perennial rye	*Secale cereale var. multicaule*	Landraces	Neglected species, perennial, used in mountains regions, can be important against erosion.
Flax	*Linum usitatissimum*	Commercial varieties	Conservation of endangered populations of specialized weeds communities
Millet	*Panicum miliaceum*	Commercial and landraces	Species grown for small scale; increase of diversity in agricultural systems
Spelt	*Triticum spelta*	Commercial varieties	Species grown for small scale; increase of diversity in agricultural systems

Vegatables

Some regions where traditional vegetable varieties are grown still exist. An extract from the report of the Kotlińska collecting mission in 1992 serves as an illustration:

"The expedition visited regions having a long tradition of growing vegetables. Included were Nowe Miasto nad Pilicą and Przybyszewo, well known for growing old ecotypes of onion, type Żytawska-Przybyszewska, and cucumber, type Przybyszewski. The seeds of these vegetables are still available on the market. The neighbourhood of Jędrzejów, Pińczów, Skalbimierz and Kazimierza Wielka is a very rich area for garlic ecotypes. In the Pogórze region, especially near Kraków, Wieliczka, Dobczyce, Nowy Targ and Mszana, different types of common bean, differentiated on morphological and agronomical characters, are still grown. Some of them were cultivated there in the XIX century. Different types of shallot and garlic, and the very old vegetable *Brassica napus* var. *napobrassica,* called 'Karpiel', were collected near Jordanów. 'Karpiel' is used for human consumption as well as for fodder. A very old, native variety of white-headed cabbage, used for pickling, is still grown in the village of Włosienica near Oświęcim. Old vegetable varieties are still grown in the north-east region of Poland too. Areas near Nowy Dwór and Elblog are especially interesting because emigrants from the former Eastern Poland live there. They still grow a lot of vegetables brought from their native regions, such as pumpkin, common bean, tomatoes of type 'Bycze Serce', Malinowy, onion (type 'Kartoflanka') and others. In eastern regions (Hajnówka, Zabłudów, Trześcianka, Nowosady) every small garden contained old ecotypes of the following crops: red beetroot, curled parsley, carrot, dill, white mustard, onion, shallot, different types of common bean, tomatoes with yellow or red fruits, and pump-

kins. The Lublin district is well known for growing vegetables; the areas near Lubartów, Szczebrzeszyn and Frampol are particularly famous for local varieties of the onions 'Lubartowska' (Wola Sernicka, Serniki, Chlewiska) and 'Szczebrzeszyńska' (Błonie, Kawęczyn, Żurawica). Moreover, ecotypes of cucumber, garlic, lettuce, carrot, red beet, common been and curled parsley were collected near Lublin".

The most valuable varieties are considered to be the local landraces of onion, cucumber and runner bean (see Table 4.10)

Table 4.10. Old cultivars and landraces of vegetables cultivated in Poland

Name	Botanical Name	Varieties/landraces
Cabbage	*Brassica oleracea var. capitata*	Stulecie Ulricha, Grębałowska, Koda, Holenderska
Cauliflower	*Brassica oleracea var. botrytis*	Inspektowy z Mor
Swedish Turnip	*Brassica napus var. napobrassica*	Wilhemburska
Radish	*Raphanus sativus*	Szkarłatna z Białym Końcem, Ognista Kula,
Turnip	*Brassica rapa*	Teltowska
Tomato	*Lycopersicon esculentum*	Karzełek Puławski, Wczesny Krakowski, Tryumf Ulricha, Malinowe, Bycze Serca
Pepper	*Capsicum annuum*	Bronowicka Ostra, Ostra z Turka
Cucumber	***Cucumis sativus***	**Warszawski, Monastyrski, Borszczagowski, Trocki, Przybyszewski**
Winter squash	*Cucurbita maxima*	Melonowa Żółta
Summer squash	*Cucurbita pepo*	Landraces of summer squash
Melon	*Cucumis melo*	Gruntowy z Mor, Dębówka Puławska
Carrot	*Daucus carota*	Perfekcja
Parsley	*Petroselinum sativum*	Lenka, Berlińska, Bardowicka
Common Parsnip	*Pastinica sativa*	Landraces of parsnip
Common Bean	*Phaseolus vulgaris*	Bronowicka, Krakowska, Bomba, Biała Wyborowa, Wiejska, Biała Eksportowa, Perłówka, Rakowicka, Mamut
Runner Bean	***Phaseolus multiflorus***	**Piękny Jaś, local forms of runner bean**
Pea	*Pisum sativum*	Sześciotygodniowy, Konserwowy, Syrenka
Lettuce	*Lactuca sativa*	Bronowicka, Rakowicka, Nochowska, głąbiki krakowskie (Local population of var. angustana)
Red Beet	*Beta vulgaris*	Rubin, Okrągły Ciemnoczerwony
Szpinak	*Spinacia tetranda*	Koda
Rhubarb	*Rheum* sp.	Wczesny Hosera
Onion	***Allium cepa***	**Wolska, Rawska, Żytawska, Koda landraces (Żytawska Drągowska, Krakowska Czerwona, Szczebrzeszyńska, Topolska, Legnicka, Lubartowska, Przybyszewska, Ostrowska, Kamieńska)**
Shalot	*Allium cepa var. agregatum*	Local populations, Kartoflanka
Garlic	*Allium sativum*	Local types of garlic (dolnośląski, from Pienin, podgórski, topolski, Rychlik)
Maize	*Zea mays*	Old varieties of mazie (Jola, Piastowska, Puławska Ryżowa and other)

Fruit trees

Conservation of fruit tree varieties deserves particular mention. A lot of varieties are not of Polish origin, but they were widely used for about 200 years. We can find also some of trees derived directly from seedlings.

Traditional fruit tree orchards have been preserved only at a very local scale until recently. The old orchards were planted to cover the individual needs of a farmer's family, and only surplus fruits were sold at local markets or were distributed among neighbours. Such farm orchards grow mainly apples and pears. Other species (cherries, plums) were planted in even smaller amounts. However there are some regions were plums and cherries were grown for the local market and were sold as fresh fruits or processed (dried, cooked). Most often only one or two trees of one variety have been grown, but the number of varieties was high, with different periods of maturity. So traditional orchards were rich with different types of trees. Additionally different climatic conditions and cultural differences increased the variability of fruit trees grown.

Currently the old orchards are endangered with extinction, both because of their age and the lack of supply of varieties suitable for small orchards on the market.

Quite a lot of educational activities and reintroduction activities, carried out both by formal and voluntary sectors, were undertaken. A good example of cooperation between the formal and informal sectors comes from the Poznań region, where a nursery and plantation of old fruit tree varieties has been established. One of the aims of the project, co-finnaced by SGP/GEF was preservation and reintroduction of traditional fruit trees varieties by the BARKA Fundation.

A second example is the Landscape Park of the Vistula River, where, as a response to public awareness and concern about the need of preserving fruit tree germ-lines, the National Centre for Plant Genetic Resources of IHAR has been financing and supervising development of an on-farm orchards network in cooperation with the Park, local government and farmers, with help from other public and private partners (environment protection associations and non-profit making organisations) since 1997. The network has various aims: collection and characterisation of plant material (both from a biological and a cultural point of view), safe-guarding varieties on farms, didactic and pedagogic purposes, fruit production and processing and landscape restoration. Local people are directly involved in these activities. It should be stressed that both above mentioned projects have been honoured by Ford Motor Company prices for conservation of environmental and human heritage.

Some on-farm conservation activities for fruit species are clearly market oriented: the selling of fruits of peculiar varieties, or their derived products (juice, jam), is reported. The activity of two experimental nurseries in collecting, propagating and selling old varieties of fruit trees for home gardens are examples which could be introduced on a wider scale.

4.2.3. Advanced cultivars

Production of seed-material

The number of registered cultivars of agricultural plants is systematically increasing. In 2000, 917 cultivars could be found in the registers. In one year between 1986–1995 about 30–32 cultivars were registered, whereas in the previous interval only 47 were registered. The inclusion of foreign cultivars increased imperceptibly and currently represents 31%. Most of foreign cultivars are sugar-beet (75% foreign), corn and winter-rape. These are mainly hybrids, or, as rape or sugar-beet are closely connected with industry. Foreign cultivars are also common on the list of registered grasses, at 34.6%.

In parallel with the ready availability of new cultivars the production of seeds from local varieties has fallen: the year 2000 was the third year in a row that production of local seed fell. In comparison to 1997, the total area producing seeds for crops has decreased about 36.5%.

Turnover and supply of seed-material

A critical indicator of the real utilization of plant breeding programmes is the supply to farmers of certified seeds. The year 2000 was the year in which the drop in the sale of seeds of cereals and certified potatoes was checked. In comparison, 1999 showed a drop of nearly 30% in sales of cereal seeds, with an even stronger decrease in the sale of seed potatoes (48%). In this year, the introduction of market rules to the rural economies came together with a general economic crisis in Polish agriculture, which, in effect, caused a sudden break-down of the seed market. In Poland sales of qualified seeds of cereals represent about 15–30% of the total sown.

The basic law regulating the qualification of seed material and turnover of seeds is the 'Seed Law and Norms'. Similarly to other European countries, the quality of seed-material is carefully defined. The systems of certifying seeds in Poland and in other West-European states are similar, as they both follow the rules of OECD.

Prices of seed-material

In Poland the relative prices of certified seed for sowing, compared to the cost of the same grain for fodder, does not exceeds 160%. In EU countries a similar comparison gives ratio between 250% and 300%. Low prices for seed-material, theoretically profitable for farmers, did not cause an enlargement of the demand for seeds.

Market of seeds of vegetables

The current number of registered vegetable cultivars is 1,191. Almost 60% of these cultivars are of foreign origin, especially for onions (66%), leek (95%), cabbages (over 8%), carrot and tomatoes. The total area of crops grown to produce vegetable seeds in Poland has decreased by 11.6%. The total amount of seed certified by laboratory test has also decreased.

Conclusions:

1. The diversity of advanced cultivars, measured as the number of registered varieties, is increasing.
2. The last few years show a considerably increased intensity of breeding efforts, as indicated by the number newly introduced cultivars, and increases of potential yield
3. The potential benefits of improved varieties are not used as widely as they should be to make agriculture more profitable.
4. Current Polish systems of breeding and seed production can cope with likely market needs, in both the quantity and qualities of seed-material needed.
5. The current economic weakness of Polish agriculture, resulting in low demand for qualified seed material, and the lack of mechanisms of collecting royalities, makes it impossible for (plant) breeding companies to be self-financing at present.
6. New conditions, making it possible to develop and sell certified seeds commercially (on competitive market rules), would improve the situation for Polish agriculture.

Changes in crop rotation

In recent years cereal grains have dominated the agricultural crops sown in Poland, representing, 70.3% of arable land, and in some places exceeding 80%. Between 1990 and 1998, the proportion of cereals grew by about 17%, with wheat accounting for almost 30% of the increase and cereal mixtures over 40%. Among the many reasons for this increase in cereals, the most important are the economic conditions. Insufficient demand for many crop products, such as potato, rape, flax, and legumes reduced the acreages of these crops. Simultaneously, a large fall in the stock of cattle and sheep, reduced the area sown with fodder crops (by about 50%).

The greatest participation of cereals in sowings is on soils of classes IVB and V (poor soils).

Further reasons are the moderately low cost and work-load needed to cultivate cereals, and their easy storage.

The effects of cultivating high proportions of cereals are very negative. Cereals are the most precious group of cultivated plants, but, on the other hand, have bad effects on soil. Prolonged and frequent tillage causes:

- diminished content of matter organic and of humus,
- impairs the structure of the soil,
- worsens phyto-sanitary state of fields,
- reduces the biomass of soil organisms,
- decreases the quantity of useful soil organisms, and increases the number pathogenic and injurious ones,
- reduce the yields of cereals subsequently sown on the same land.

4.2.4. Weed communities of crops

Recently we have seen great changes to the synanthropic vegetation, resulting from the general economic transformations in our country. Among other things this is connected with the intensification of agriculture and industry and also urbanisation of the country. The threat to the Polish ruderal flora is constantly increasing and the rate of extinction of ruderal plant species is increasing. Because of this, interest in the problem has grown in resent years, and studies on the dying-out of these endangered segetal plant species in Poland have become more frequent; Warcholińska (1994) published a list of 103 threated segetal plant species. Few of these threated species were also covered by the 'Red List of Vascular Plants threated in Poland' or were in the 'Polish Plant Red Data Book' (Zarzycki and Kazimierczakowa 1993, Zarzycki and Szeląg 1992). Warcholińska's list of 103 taxa (species or, exceptionally, subspecies and forms), makes up over 20% of Polish segetal flora. Two species are protected by law, namely *Muscari comosum* and *Ornithogalum umbelatum*. Many of the taxa described by the list are highly specialized species, with very narrow ecological niches and have specific habitat requirements. Many of these species are represented only by small populations. *Camelina alyssum*, the weed of flax fields, has most probably become extinct in its whole range (Zarzycki and Kazimierczakowa 1993, Zarzycki and Szeląg 1992). Threatened segetal plants in Poland show include many wetland species, particularly species with Atlantic or sub-Atlantic ranges, such as *Anagallis minima, Centaurium pulchellum, Hypericum humifusum, Illecebrim verticillatum*. The Warcholińska list covers 27 species which are rare. They are threated mainly because they occur only in small numbers of sites, each often supporting only a small number of plants *e.g. Aphanes microcarpa, Juncus capitatus, Muscari comosum, Papaver strigosum, Saxifraga tridactylites, Thymelaea passerina, Vaccaria pyramidata*.

On the larger scale the main losses of plants occur on cultivated fields, where under the influence of more advanced agricultural techniques, and especially the recent widespread and impetuous use of herbicides, formerly widely distributed segetal plants are rapidly eliminated, such as: *Papaver rhoeas, Agrostemma githago, Centaurea cyanus, Adonis aestivalis, Bupleurum rotundifolium* and many others. They are replaced by expansive monocotyledonous plants, such as *Apera spica-venti*.

The most effective way to conserve these plants is to safeguard sites where these herb-rich communities occur. The floristic composition of the herb communities does not depend solely on the type of cultivated crop, but is connected very intimately with the method of soil cultivation; different associations occur in cereals as opposed to root crops. Traditionally communities of field weeds *(Secali-Violetalia arvensis)* are divided to two groups: the cereal communities *(Centauretalia cyani*) and theroot and tuber crops weeds communities (*Polygono-Chenopodietalia*). The further differentiation of these two types of communities depends mainly on the type of soil.

A special position is occupied among cereal weed communities by species associations linked with fields of flax. A group of highly specialized weeds exists, exclusively associated with flax cultures, which in the Polish flora comprise: *Camelina alyssum, Cuscuta epilinum, Lolium remotum* and *Spergula arvensis* subsp *maxima*. These plants show striking morphological convergence with flax, and also by the weight and size of their seeds. In recent years, as a consequence of the nearly com-

plete elimination of weeds from flax fields, these unique aspects of Poland's flora have been almost completely exterminated.

In both cereal and in root and tuber crops, we observe distinct differences in the floral composition of weeds growing on different kinds of soils. However, the communities are able to keep their floristic separateness only when farmers preserve traditional crop rotation systems. A vital factor affecting the chances of persistence of communities of weeds is the farmers' strategy of sowing. Seeds and fruits of many characteristic species of cereal weeds, especially at low levels of farm management, are dispersed with the seeds of crops. Seeds of characteristic species for *Centauretalia cyani* attain their highest capacity for germination soon after ripening and very quickly lose it with the passage of time (e.g. *Agrostemma githago* and *Bromus secalinus*). If farmers use carefully cleaned crop seed material then these species have almost no chance of germinating, and in consequence very quickly disappear. In contrast, most of the weeds in root and tuber fields, have seeds which retain their vitality for long periods, creating 'seed banks' in the soils. Thus the weed communities characteristic of traditionally sown cereal fields depend crucially for their germination upon being sown into the ground with cereal grains, whereas weed species characteristic of root and tuber crops are much more robust, and can regenerate from reserves of seeds accumulated in the soil.

The cereal weed communities most threatened with extinction and thus in most urgent need of protection are listed in Table 4.11. They comprise communities on calcarious soils and those of associated with flax.

Conservation of these herb-rich communities can be achieved on marginal fragments of fields. Such practical protection of crop-weed communities should not create major problems on the borders of national parks and nature reserves (nature reserve is a level of protection), especially after traditional methods of 'extensive agriculture' are restored in them. In "reservations of weeds" there should be:

- traditional and extensive agricultural management, without the use of herbicides and fertilizers or of heavy agricultural machines (which change the physical properties of the soils),
- maintain the cultivation of crops (and varieties) traditional and typical for the region,
- maintain the traditional methods of crop rotation e.g. three field system,
- exclude several successive years of cultivation of grasses on fields, and avoid the cultivation of mixtures of small-grain legumes,
- use only seed material originating from the region,
- clean the seed material using only traditional methods,
- if necessary, deliberately sow seeds of weeds assembled from nearby regions.

The first priority should be 'reservations' for the typical weeds for flax fields. The most effective places to create these are those regions, where circumstances have allowed traditional (primitive) agricultural methods to persist and thus have allowed the longest persistence of flax weed specialists.

Table 4.11. The most threatened communities of weeds

Threatened community of weeds						
Community	**Important species**	**Conservation value**	**Typical sites**	**Distribution**	**Threats**	**Factors helping Maintain the weed communities**
Consolido-Brometum	*Consolida regalis, Papaver dubium, P. rhoeas, Agrostemma githago, Centaurea cyanus*	Traditional, showy species of plants	Calcareous soils	Suwalszczyzna, Pogórze Przemyskie	Excessive use of chemicals, fields consolidation	Extensive agricultural practice, low fertilization and prohibition of use of herbicides
Caucalido--Scandicetum	*Adonis aestivalis, A. Flammea, Anagalis coerulea, Bupleurum rotundifolium, Caucalis daucoides, Conringia orientalis, Scandix pecten-veneris*	Species preferring calcareous soils	Calcareous soils	Wyżyna Małopolska, Wyżyna Lubelska, Wołyń Zachodni	Excessive use of chemicals, fields consolidation	Extensive agricultural practice, low fertilisation and prohibition of use of herbicides
Spergulo-Lolietum	*Cuscuta epilinum, Camelina alyssum, Lolium remotum, Linum ustatissimum*	Highly specialized weeds	Different types of soils	Formerly very frequent w Beskidy and North-east Poland. Highly endangered, probably extinct	Cleaning of seed material	Extensive agricultural practice, low fertilization and prohibition of use of herbicides, traditional flax cultivation

4.2.5. Grasslands

Semi-natural grass communities are characterized by a wealth of herbaceous vegetation creating flowering meadows (herb-rich meadows), which may also have *Carex* and *Juncus* if the habitat is damp enough. The most precious communities are characterized by a compostion of up to 70 species of vascular plants (e.g. xero-thermic lawns, *Molinietum* meadows). In mountainous regions many unique endemic species are concentrated in these communities. Particularly valuable are the extensive, or moderately extensive habitats, which result from traditional forms of management. Open lands in the valleys of large rivers were traditionally shaped by extensive management of grazing and mowing. Pasturage in Poland uses mowing to provide winter fodder, and sometimes litter for bedding. In extensive valleys, such as the Biebrza, different forms of maintenance were used: grazing predominated on the edges of valleys whereas the inner flooded meadows were mowed.

Salt marshes

Salt-marsh communities are rare in Poland, occurring only on the Baltic coast and around some small deposits of salt in the centre of the country. They possess considerable botanical value. These plant communities comprise rare and very specialized species. Traditionally local people use them as hay meadows and pastures, but they are of marginal agricultural value. They are threatened by abandonment, by intensive management with high levels of fertilizer use or embankment of drainage which will alter the salinity. Such communities are ranked high among communities for the protections of biological diversity at a European level and are included in the ecological network NATURA 2000.

Meadows

Meadow communities are semi-natural or, more and more often, anthropogenic. They may occur in a variety of situations: on rich and very rich soils, on undisturbed soils, mineral and organic-mineral or soils originated from low peat. Critical factors for their existence are mowing or grazing, and sometimes regulation of water levels. In agricultural landscapes meadows may occupy large or small areas, and meadows can dominate farm landscapes, especially where there is much wetland or where climatic conditions make the growing of field crops unprofitable. Until the last few years, Polish meadow communities had characteristics of spontaneous, semi-natural systems. But recently more and more farmers adopt more intensive production and traditional meadows, formerly rich with species disappear, and are replaced by (monocultures) of sown commercial varieties only.

Dry, warm meadows and lawns

Communities of dry, warm meadows and lawns with steppe characteristics are also very closely connected with agricultural areas. They occur in small pieces, or as belts in upland areas in special environments. These are warm habitats, usually situated on the southern slopes of knolls, loess and calcareous rocks. Traditionally, such places were usually extensively over-grazed and were characterized by the occurrence of many rare and of relict species of plants. In the past uniformed 'pro-

tection' of these habitats banned their traditional use and resulted in them becoming overgrown with shrubs, thereby destroying the very species the reserves were intended to protect. To retain such communities it is vital to keep them as elements of a sustainable, extensively used agricultural landscape.

In the last few years the area of semi-natural meadows and pastures has continually shrunk, as a result of farm abandonment, intensification of management or hydrological changes. Although extensive, moderately used meadows are still widespread in Poland, their acreage is still shrinking consistently: first of all as a result of reduced stocks of cattle and the reduction in grazing, which leads to successions of new vegetation types. Abandoned farmland is the main threat to the unique values of these natural open grounds, especially where former agricultural intensification met environmental barriers. In other regions meadow biodiversity is endangered by more intensive management and modern cultivation technology. The root cause of this process is the necessity to adapt Polish agriculture to the EU market and increase the profitability of production. From an environmental perspective, a crucial alternative to the abandonment of marginal agricultural lands of the intensification of production technology is the initiation of successful agri-environmental programmes.

The most important semi-naturals habitat which merit conservation by such 'green uses' are:

- Warm, dry xero-thermic lawns,
- Semi-natural hay meadows,
- Semi-natural pastures (lowland and mountainous),
- Bog – meadows,
- Meadows of outstanding ornithological value,
- Salt marshes.

Threats to the biological diversity of grasslands result from:

- neglecting or abandoning meadows and pastures, which are subject to spontaneous natural afforestation (vegetation succession),
- intensification of management on meadows or pastures (early mowing and grazing, increased stocking densities),
- Permanent changes to habitats resulting from: drainage; the elimination of spring floods; fertilizer use; liming,
- changes of agrarian structure, causing deterioration of the ecological mosaic, and the introduction of monocultures of plants over wide areas.

The aim of biodiversity conservation activities is the preservation or enlargement of the botanical diversity of these habitats, with special attention for the protection of priority species of rare plants, insects and birds. The management methods recommended to achieve this should depend on the type of grassland, and also on the management practices at present and in the past. Thus abandoned herb-rich pastures will require the restoration of a suitable grazing regime, whereas meadows where rare natural plants have suffered from over-grazing will need reduced densities of stock, at least at some times of year.

4.2.6. Biodiversity and landscape

Technically, rural landscapes belongs to the group of anthropogenic landscapes (modified by man). Richling (1992) notes that the notion of a landscape is sometimes used in course of considerations of perceptions of surroundings use; Andrzejewski (1992) ascertains that analysis of landscapes can be driven from the point of view of the visual dependence between abiotic, biotic and man-made elements, which an observer perceives on a given area. Then the visual aspect of landscape is treated as a view of the natural environment with elements of an anthropogenic infrastructure.

In Poland, the most important areas to protect are those with a diverse, fragmented structure of agricultural landscape and areas here rare and rich communities of plants and animals occur. Especially important in Poland are its calcareous and seaside landscapes. Special attention should also be given to maintaining the biological diversity of landscapes by maintaining natural habitats in (river) valley bottoms, creating a network of corridors linking a system of natural (nature reserve) areas within the country.

Especially precious are following landscapes:

- Agricultural landscape of the coasts of the Baltic Sea;
- Lowland landscape with a fine-scale mosaic structure of fields, meadows and forests;
- Traditional agriculture of glades in forests;
- Landscape of river-valleys;
- Upland calcareous landscape;
- Landscape of mountain pastures.

The selected areas cover about 60% of the agriculturally used area of the country.

4.2.7. Conservation activities

In-situ preservation of genetic resources

The introduction of a system of protected areas has been considered in Poland since the beginning of the 1980's. The main goal was to strengthen the relationships between areas with various degrees of protection. The most valuable areas, i.e. nature protection areas and national parks, constitute the main links of this network, with landscape parks and areas of protected landscape joining them into a whole 'network' system. Additional buffer zones, consisting of productive forests, afforested grounds, wasteland, meadows, tree plantations along rivers, and farms managed by extensive agricultural methods are going to be established. National parks are the most powerful way of wildlife preservation. They are established mainly on natural or nearly natural ecosystems. There are now 22 national parks in Poland, covering an area of 305,675 hectares (1% of the country's total area). Three of them (Białowieża National Park, Babia Góra National Park and S;owiZski National Park) were included by UNESCO in the International Biosphere Protection Network. The primeval forest along with the flora and fauna of the Białowieża National Park are a part of the World's Natural Heritage within the

Convention of World Natural and Cultural Heritage. The system of nature protection areas (reserves) consists of 1,251 areas covering 41,200 hectares. Until now 120 landscape parks were established, which, together with their protecting buffer zones, cover an area of 2.4 million hectares. Areas with the most typical landscapes for a given region are included in, and protected as, areas of protected landscape. These areas cover now 6.7 million hectares. At present 31% of the country's total area is protected in various ways.

Plans for conservation have to be prepared for all protected areas. The inclusion of agricultural land in the total protected area is increasing with time and varies according to the protection regime (see Table 4.12) Refugial areas of agriculture among natural ecosystems can be used to conserve plant genetic resources, and increase the value of the whole regions.

Table 4.12. Protected areas in Poland

Protection category	% of country area	% of agricultural land
National Parks	1.0	13.3
Reserves	0.5	No data
Landscape parks	7.7	36.3
Areas of protected landscape	21.6	48.4
Other	0.3	No data
Total	**31.1**	**-**

212 plant species are fully protected by the Polish law, and 28 additional species of economical or medical importance are partially protected. 418 species of endangered vascular plants are currently under investigation as the initial step toward countrywide monitoring system of endangered species. The monitoring system started with verification of stands and description of ecological parameters (number of plants, their condition) of endangered species. The study will be periodically repeated and will give an overview of changes going on in the populations. The contributors to the system stress the necessity of also monitoring archeophyte species (traditional weeds linked with cereal communities).

A database of the most endangered species of vascular plants in Poland is in preparation. An "Atlas of distribution" of all vascular plants both native and introduced, found in Poland has been published.

Plant germplasm conservation is mainly the task of agricultural institutes. Collecting and preservation of plant germplasm was inititated by Professor Kaznowski at the PINGW (State Research Institute for Rural Development) in Puławy and at the Agricultural University in Dublany (Ukraine). Germplasm preservation of plant species of economic importance has been continued since 1971 at the Plant Breeding and Acclimatization Institute. The National Department of Plant Genetic Resources has been founded on the basis of the agreement between the Ministry of Agriculture, Ministry of National Education, Polish Academy of Sciences and the Ministry of Industry. The samples gathered in the collections are recognized as a part of the national heritage.

The following main tasks have been assigned to this programme:

- protection of plant genotypes against genetic erosion by gathering them into collections,
- evaluation of the collected materials,
- conservation of the genotypes in the living state and their provision to plant breeders,
- documentation of the collected materials.

In the years 1986–1990 this programme has been realized in the form of co-operation between the collections and the central storage and documentation center localized at the Plant Breeding and Acclimatization Institute (PBAI) in Radzików. The programme has been co-ordinated by IHAR and financed by the Ministry of National Education. The programme was limited in 1990–1992 because of poor financing. Currently the collections are financed by institutions from their own means. Some of them are financed partially by the Biological Progress Fund of the Ministry of Agriculture and Food Industry (announcement of the Minister of Agriculture and Food Industry from 30 March 1993). Three universities, 9 branch institutes, 7 experimental stations (among which 6 of the Plant Breeding and Acclimatization Institute), and the Botanical Garden of the Polish Academy of Sciences are partially financed from the state budget.

The materials in the collections are gathered during collecting missions and exchanged with other gene banks, institutes, botanical gardens and plant breeders. About 60,000 accessions have been collected. They represent all economically important plant groups: cereals, fodder plants, root crops, vegetables, fruit crops, herbages and industrial plants. The most valuable part of the collections are old varieties from local populations collected during expeditions.

Collecting missions

Systematic explorations with the aim to collect landraces of agricultural crops have been started in 1971. The expeditions are carried out every year. Between 1990 and 1992 the number of expeditions performed was limited by low financing. The expeditions are organized jointly by the National Centre for Plant Genetic Resources of the Plant Breeding and Acclimatization Institute (agricultural crops and other species), the Botanical Garden of the Plant Breeding and Acclimatization Institute (grasses) and the Department of Germplasm Collection of the Institute of Vegetable Crops, and other contributors. Two to three expeditions are undertaken annually.

During the expeditions regions rich in local races of agricultural and horticultural crops (north-eastern and southern part of Poland) are visited. Seed samples are obtained from farmers or at local markets. Every accession is accompanied by relevant information. Registration of old gardens of fruit trees and collecting of medicinal and ornamental plants found in house gardens are new task recently assigned to the expeditions. More than 1,300 seed samples have been collected during the expeditions performed on the territory of Poland. In the last three years alone, 660 samples of seed have been collected.

4.2.8. Genetically modified organisms (GMO)

The first Polish transgenic crop plants appeared in 1993. Later on, Western companies strove to supply their varieties and transgenic products to the East European markets, including those in Poland. Since 1997, under individual permissions issued by Minister of Agriculture and Food Industry, transgenic varieties of crop plants appeared in strictly controlled field experiments in Poland. The development of biotechnology will, in the near future, also affect the economic output of agriculture in Poland. This implies the necessity of rules to regulate GMO crops.

Due to the risk arising from the use of products obtained from genetically modified organisms, in human and animal foods, and in the light of the possible negative ecological implications and moral reservations related to releasing such organisms into the environment, there is a need for legal regulations to be developed and introduced for handling GMO and their products. International commitments undertaken by Poland set the need for a law concerning GMO to be in compliance with international standards. Namely the following documents:

- Agenda 21 (Final documents of the UN Conference "Environment and Development" Rio de Janeiro, 3–4 June 1992)
- Convention on Biodiversity
- Cartagena Protocol

EU Directives:

- Council Directive No 90/220/EEC of 23 April 1990 on deliberate release into the environment of genetically modified organisms (Official Journal No L 117/15),
- Council Directive No 90/219/EEC of 23 April 1990 on the contained use of genetically modified organisms (Official Journal No L 117/15).
- Directive 2001/18/EC on the European Parliament and of the Council on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC

Existing regulations on GMO

In June 1996, on the initiative of the Ministry of Agriculture and Food Industry, an inter-disciplinary Consultative Group on GMO was established with the following responsibilities:

- consulting legal regulations,
- assessing applications for the release of GMO into the environment in Poland (certified field trials).

This interdisciplinary group assembles the representatives of science and government administration. Ministry of Agriculture and Food Industry appointed also a Commission for Registration of Biological and Chemical Plant Protective Agents and Transgenic Plants. The Interdisciplinary Consulting Group elaborated a format for application forms for the admission of transgenic plants to field experiments. These formats were prepared according to recommendations of the EU Council Directive 90/220 of 1990.

The Interdisciplinary Consulting Group received four applications in 1997 for the permission to conduct field experiments. At the same time the Parliament of Polish Republic addressed the need for establishing the principles for conducting experiments with GMO and assessing the risk of their release. In July 1997 an Environmental Protection Act was amended. Article 37A of this act entitles the Minister of Environmental Protection, Natural Resources and Forestry, in consultation with the Minister of Health and Social Welfare, the Minister of Agriculture and Food Industry and with the Chairman of the Committee for Scientific Research to regulate, by decrees, the following issues:

- requirements for applications for permissions to release GMO s to the environment and their marketing,
- requirements for the assessment of environmental and health hazards, including the range of studies and analyses which must be prepared.
- requirements for labelling and packaging of GMOs and products thereof.

Article 37A has been in force since 1 January 1999. The decree, containing the executive regulations, has been signed by the Minister of Environment of 8 October 1999. Application forms were prepared according to the European Union directives.

A new act "On Genetically Modified Organisms" has been accepted by Parliament of 22 June 2001. The Act regulates all aspects of contained use and deliberate realise into environment of GMO including transboundary movement. Genetically modified foodstuffs are the responsibility of the Chief Sanitary Inspector (Act of 11 May 2001 on health conditions for foodstuff and feeding).

Table 4.13. Regulations concerning GMO

Legal acts concerning GMO
Environmental Protection Act of 31 January 1980 (Journal of Law No 49/94 para. 196 – uniform text, changed Journal of Law No 133 of 29 October 1997 para. 885)
Act on genetically modified organisms of 22 June 2001 (Journal of Law 76/01 para 811)
Act regulating production conditions and placing on the market of foodstuffs:
Act of 11 May 2001 on health conditions for foodstuff and feeding (Journal of Law No 63 para 634)
Decree of Minister of Health and Social Welfare of 17 December 1973 on permissions for placing on market and importing some foodstuffs. Journal of Law No 51 para. 293
Decree of the Council of Ministers of 13 April 1973 on the rules for handling foodstuffs and stimulants of improper health quality (Journal of Law No 19, para. 110)
Regulation of Minister of Health and Social Welfare of 31 January 1972 on the sanitary control of the quality of imported foodstuff (Journal of Law No 4, para. 18)
Patenting and intellectual rights
Patent law (Journal of Law 30 October 1993 No 4)
Seed law (Journal of Law 24 November 1995 No 95.149.724)

Current patent law in Poland, in force since 1993, allows for patenting biological systems like genes (including human genes), techniques for the isolation and iden-

tification of genetic material, modified genes, technologies of gene transfer and organism modification. Patent protection of pharmaceuticals, chemical compounds, foodstuffs and food additives, and of the processes of isolation and identification of natural products, genetic technologies and transfer of biological systems, are regulated by the act (Journal of Law 30 October 1993 No 4). It is also possible to patent such Polish products in EU countries. By the decision of European Patent Office it is possible to patent: a gene, the methods of its transfer to another organism and the method of gene identification and isolation. Living organisms are also patentable. In Poland all multi-cellular organisms, except humans, may be patented.

Under an associative agreement with EU, Poland is committed to harmonize its law on intellectual property protection with the European law. Appropriate initiatives are being undertaken in order to subscribe to the convention and to be included in the European patenting system. In European Union countries, legal protection of plant varieties secures the interests of the growers. Development of transgenic plants called for actions to improve protection of the rights to varieties. Many EU countries introduced an international system of the legal protection of varieties. Countries who agreed to grant breeders exclusive rights to the commercial exploitation of new varieties adhere to the Convention of International Union for the Protection of New Plant Varieties (UPOV). According to the UPOV convention, the owner of a protected variety has to get a license from the gene owner for its introduction, but also the gene owner has to obtain permission from the owner of protected varieties to introduce a gene. In view of this convention plants obtained through transformation are qualified as "significantly derivative varieties" as opposed to "original varieties".

Control of the international trade of GMO

In 1994 Poland joined the so-called Australian Group, which comprises states who set up common principles for the control of trade in hazardous commodities. Some genetically modified organisms are qualified as such. In a Polish Act of 24 December 1993, on the principles for particular control of international trade of goods and technologies in relation to international agreements and commitments, exports are regulated, as is the import and transfer of organisms which possess pathogenic sequence of nucleic acids and originate from organisms listed on a special list of Minister of Economy. Poland has also signed Cartagena Protocol (Biosafety Protocol). The obligations coming from the Protocol are in the scope of the Act on Genetically Modified Organisms.

Organizational framework

The task of the national biosafety system is to provide for an indispensable level of biological security with respect to the release and use of genetically modified organisms by:

- assessing possible negative effects during deliberate releases into the environment,
- establishing monitoring systems,
- planning emergency actions to deal effectively with accidents,

- establishing systems to provide consent and certification for each stage of experiments and deliberate release into the environment,
- establishing a body with the mandate to provide decision advice and control on registration, consent for GMO release and codes of practice,
- developing information systems,
- establishing international co-operation,
- training personnel.

The principle of the National Biosafety System is that it builds upon existing institutions in Poland.

Co-ordinating body (National Competent Authority)

Genetically modified organisms have to be considered in three sectors of activities: contained use of GMO, deliberate release into the environment, and the placing on the market of products containing genetically modified organisms, or consisting of such organisms or their parts. In the European Union GMO issues are regulated by two directives: 90/219 (contained use) and 18/2001 (deliberate release into environment and products) These two areas of GMO application (deliberate release into environment and products) are addressed by Polish law and are under the responsibilities of the Ministry of Environment in co-operation with Ministry of Health and Social Welfare, Ministry of Agriculture, Scientific Research Committee and other ministries.

As the Minister of Environment is the National Co-ordinator for the implementation of the Convention on Biological Diversity, thus the bio-safety matter falls within his competence.

Committee for Genetically Modified Organisms

The Committee for Genetically Modified Organisms will be established by the Ministry for the Environment. The members of the Committee are representatives of the responsible ministries and group of experts. The Committee acts as the advisory body, but may also play a significant role in decision making. The Committee may ask panels of outside experts, designated by other ministries, for advice.

The Committee for Genetically Modified Organisms will be entrusted with the following responsibilities:

- preparation of recommendations for risk assessment to human health and environment,
- general recommendation for the executing agencies,
- evaluation of all applications.

Control of release of GMO

The system of control of GMO release is build upon existing law and institutions. There are several state agencies under the competent ministries with responsibility to undertake control measures in defined area of national activities. Those agencies are included in the control system for GMO. Competent Agencies which are granted responsibility for control of GMO marketing are:

- Plant Protection Inspection

- Market Inspection
- Customs Service
- Phyto-sanitary Service
- Environmental Protection Inspection
- Veterinary Inspection
- Sanitary Inspection.

Reference laboratories

The system of control of the use of genetically modified organisms and their products has to be supported by reference laboratories, which provide expertise on genetically modified plants, animals, food and feed. These responsibilities can be delegated to already existing scientific institutions. The reference laboratory will also provide technical support to the biosafety system of GMO, and will be engaged in training. The Ministry of Environment will designate the reference laboratories. The laboratory will provide expertise with respect to those products which are under their competence. The reference laboratory will also provide technical support to the biosafety system and will be engaged in the training of civil servants

Applications

Applications for GMO release and utilization are directed to the Ministry of Environment, as to General Coordinator for GMO matters in the country. The responsibility for taking decisions about foodstuffs and drugs derived from GMO is given to the Ministry of Health and Social Welfare (General Sanitary Inspector).

Applications are required for:

- Approval of GMO use in containment: such applications should supply all necessary data and be prepared according to EU Directive 90/219.
- Approval for deliberate GMO release into the environment; such applications should contain all necessary data and be prepared according to EU Directive 90/220 and its annexes.
- Approval for the introduction into the market of GMO and their products, according to EU Directive 90/220 and other EU regulations dealing with food and food products (particularly with EU Directive 93/114 and the 'Regulation of European Council and European Parliament No 258/97' on novel foods).

Each application must contain an assessment of risks to the environment and suggested procedures of risk management, as specified in the respective regulations. All costs connected with risk assessment are the obligation of the applicant. Each individual application is reviewed with regard to potential risk arising from deliberate or accidental release of GMO into environment by the Committee for Genetically Modified Organisms.

Decision making strategy

The following steps are proposed for decision making by the Minister of Environment in GMO matters.

- Applications should be delivered to the GMO General Co-ordinator.

- Formal screening by the Secretariat.
- Formal notification to the applicant that the proposal for evaluation has been received.
- Evaluation of the proposal by GMO Committee and preparation of the proposed decision for the Minister.
- The GMO Committee will present agreed draft decision proposals for discussion with NGO's and other organizations.
- The GMO Committee's final proposal will be forwarded to the Minister of Environment.
- The Minister of Environment takes the decision and publishes it in an official journal.

Information system

Establishment and implementation of an efficient and effective information system is one of the objectives of the biosafety framework programme. Such obligation accrues from the Convention on Biological Diversity and is reinforced by the Biosafety Protocol. Article 20 of this protocol refers to the issue of information exchange via a Clearing House Mechanism. The UNEP Technical Guidelines for Safety in Biotechnology recommends the establishment of national bio-safety information exchange systems. Poland has to adopt CBD standards and also observes those set up by the European Community, in respective directives, in order to comply with the negotiation process of Polish membership of the EU.

The database will provide a register of all national activities concerning GMO such as trade, industrial and legislative initiatives and products containing GMO. Thus the information gathered in the databases files will relate to:

- applications,
- laboratory and field trails,
- permissions for the release of GMO to environment/market,
- products containing GMO,
- trans-boundary movements of GMO (import and export),
- GMO risk assessment, monitoring and control.

Data maintained in the database will be available on request to institutions such as those involve in the food and pharmaceutical industry. Some information will be maintained as confidential and therefore could not be released. Confidentiality clauses could not be applied to data related to biosafety and environmental protection. International database for the purpose of Secretariat of the CBD will be available in the Biosafety Clearing House Mechanism system (BCHM).

Access to information and public participation in the decision making process

A recent survey performed by the Centre for Studies on Public Opinion (OBOP) showed that Polish society, like those of other countries, is indeed aware of and interested in biotechnology development and its implication for human life and the environment. Society demands, and has every right to be granted, access to information and to participate actively in the decision making process with regard to matters concerning GMO.

Access to information will be ensured through:

- Providing to the public information which is not covered by confidentiality clauses. Presumably, all data assembled in international database/bases will be accessible (e.g. via the internet). Information from other sources of relevant data, such as the data bases of international organizations and CHM of the Convention, has to be made available.
- Important contributions to widely acknowledged periodicals to publicise the presentation of GMO issues, and/or issuing information bulletins, which would provide information on GMO releases, ongoing or completed research with GMO, methodologies of assessment and management control of GMO hazards.

NGOs which represent society, producers and consumer organizations will be allowed to actively participate in the decision making process, regarding all activities with and related to GMO. Such participation is of particular importance with regard to the products which the public is directly interested in (e.g. agricultural crop plants, human food products, animal feed and pharmaceuticals). To achieve efficiency and effectiveness of this process the new regulation will ensure representatives of competent NGOs, 'producers' and 'consumers' organizations take part in the decision making through reviewing all proposals for decision elaborated by the Committee for Genetically Modified Organisms. This procedure will allow the public to voice their opinion, which would then have to be considered by the Minister of Environment in making the final decisions.

Conclusions

The act "On genetically modified organisms", which is to regulate most of the problems in respect to GMO, has already been accepted. This act does not address questions of protection of intellectual property rights and the implication of GMO in medicine. The act establishes rules for the contained use of GMO, releasing genetically modified organisms to the environment; it also establishes a system of control.

1. In Poland work on the elaboration and initiation of the National Biosafety Framework are driven and based on settlements and international experience.
2. Polish solutions are coherent with systems accepted in the European Union.
3. To start with, executive rules regulating releasing GMO use existing systems and structures for monitoring and controlling the risks to the environment and health of people.
4. The minimization of risks connected with research into GMO demands: creation of transparent procedures of estimating threats and undertaking decisions; continuous training of personnel responsible for undertaking decisions and controlling their realization; Creation of properly equipped centres for testing transgenic plants and animals.
5. Society has to be informed about the progress of biotechnological works, and to have influence on the undertaking of decisions relating GMO.

4.3. Animals

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4.3.1. The state of genetic resources

Introduction

The state of animal genetic resources in Poland nowadays has resulted from various processes and transformations taking place in the Polish economy, agriculture and animal sector. The tradition of intentional selective animal breeding in our country goes back to the end of XIX century, when the first Breeders' Societies and herd books were established. The genetic material available at that time for Polish breeders consisted mainly of local populations, primitive, but very well adapted to our environmental conditions. In addition, starting from XVIII century, through the annexation period, and between World War I and World War II, high quality pedigree animals were imported from different European countries by owners of large agricultural estates, and this greatly facilitated the genetic improvement of Polish livestock.

The numerous wars and uprisings, rolling over our territory, thwarted these efforts of the Polish breeders; much valuable breeding stock was slaughtered or dispersed, so the breeding programs had to be started from the scratch. It is important to realize that in inter-war period many Polish breeds had attained high levels of performance, which was lost, and only regained after many years of new selective breeding.

The introduction of a market economy in 1989 marked another breakdown in animal husbandry in Poland. The low profitability of agriculture, and especially animal production, resulted in decreasing numbers of livestock of most species. At the same time the opening of the Polish market to international competition, and the limited state control the over import of breeding stock, resulted in the introduction of a lot of exotic genetic material. The current state of animal genetic resources in Poland has, to a considerable extent, been influenced by these transformations, which took place in Poland only over the last decade.

Sources of information

The data regarding stock number comes from an annual agricultural census, carried out by the Central Office of Statistics. The census is usually based on a sample and includes 0.75% of private farms in the case of cattle, sheep and poultry and 0.5% of pig farms. Every ten years a full census, covering all agricultural farms is carried out, the last one taking place in June 1996.

The census provides information on stock number of major farm animal species, and in the case of large animals, also on the sex and basic age categories. However, the information on breed structure within each species is not available within the present system. Adding such information might be considered in preparation for the implementation of the EU Directive on animal identification and recording, the

so called "animal passports". Such a solution has already been implemented in Sweden.

The basic and the most reliable source of information on breed performance comes from the official recording scheme carried out in the active animal population. The breed structure, observed in the pedigree sector, is transposed into the whole population of given species. In the case of cattle, pigs, poultry, bees and fur animals, the National Animal Breeding Centre used to be in charge of recording and selection programmes, while the Polish Sheep Breeders' Society and Polish Horse Breeders' Association are responsible for performance recording and herd books in their respective species. Data provided in the annual reports of all these organizations were used in the preparation of this report.

Additional ways, which might be used to predict breed structure and population trends, concern the production of breeding stock (the number of animals registered in a given region in the case of geographically restricted populations) or come from direct monitoring, when breed number is very small and animals are kept in a few herds only. The last option concerns mainly indigenous breeds, usually limited in number and often classified as endangered.

The state of animal genetic resources

Table 9 (see Annex) shows the genetic diversity of the major farm animal species, as found in Poland at the end of 1999. Data concern active populations only and come from official recording schemes, carried out by the Central Animal Breeding Office, Polish Sheep Breeders' Society and Polish Horse Breeders' Association.

Cattle

Since the Second World War, cattle breeding in Poland was based on dual-purpose Black and White cattle, which constituted the majority of the cattle population. However, in the last couple of decades there was a strong trend observed, to separate these two types of use – dairy and beef. This process was supported by extensive import of Holstein-Friesian semen to upgrade the Polish dairy population and, since 1994, the implementation of a beef cattle development programme, based on various beef cattle breeds imported mainly from Europe. It resulted in successively decreasing numbers of Polish Reds and Simmentals, both breeds traditionally having a significant share of the total cattle population.

According to of Central Office of Statistics, in 1999 cattle numbers were estimated as 6,555 thousand animals, including 3,417 thousand cows. The active population constituted only 11.6% of the whole population. From among the 379,147 recorded dairy cows, 93.5% were Black and White, 4.8% Red and White, 0.9% Simmentals and 0.8% cows belonged to other breeds.

So, dairy production is in fact based almost entirely on one breed, which is characterised by high variation: from highly productive cows (having a large share of Holstein-Friesian breed in them) to a dispersed mass population of a low or medium milking capacity, which are rarely subject to any breeding effort.

In the case of beef cattle almost the whole pure-bred population, based on imported animals, is entered into herd books. In 1999 the beef cattle population

covered 16,618 cows and comprised 7 pure breeds (Limousine, Hereford, Charolais, Angus black and red, Simmental, Piemontese and Salers) and 9 types of backcross hybrids. Furthermore, the commercial population based on back-crossed material is also being developed. Currently beef cattle breeds kept in Poland represent genetic material appropriate for both extensive production systems and for intensive fattening; however, their suitability and value under the conditions of Polish husbandry requires further studies.

The changes observed in the agricultural sector resulted in dramatic decreases in the populations of Polish Red cattle, the only indigenous Polish cattle breed, and in fact the only breed preserved in Europe, which derives from *Bos primigenius Bojanus*. The Polish Red cows were crossed with Angler bulls or displaced by Black and White cattle of a better milking performance. Currently Polish Reds consist of two sub-populations, one pure-bred population and one population improved by upgrading with other dairy red breeds.

In September 2000 the Central Animal Breeding Office took steps to initiate the restitution of another autochthon cattle breed, currently regarded as extinct, the Polish White-backed cattle. Several dozen cows with phenotypes typical of this breed were recently found in the Białystok and Lublin regions.

Horses

The continuing decline of the horse population observed in the last decade resulted from more and more pronounced changes in the utilisation of this species: in cold-blood type 'working' horses, for draft or meat use, and hot-blood types, in particular Wielkopolski and Małopolski horses – from general purpose to riding, recreation and sport use. According to the data from the Central Office of Statistics the population of horses in 1999 consisted of 551.5 thousand head and was 1.7% lower than in the preceding year.

The performance recording and registration in the stud books covers only a small part of the population, only 26,501 mares in 1999. The breed structure of mares entered into the studbooks was dominated by very differentiated groups of cold-blooded horses, which encompasses different local types (35.6%) and Wielkopolski horses (23%). The Małopolski breed and noble half-blood constitute 12.7% and 12.2% respectively and the heaviest warm-blooded breed – Silesian horses 8.6%. The smallest share among mares in studbooks, below 2%, belongs to two native breeds – Polish Koniks and Hucul horses.

The growing interest in the breeding of Polish Koniks and Huculs, observed in the last decade, is due to their high suitability for family recreation, hippotheraphy, and recently also vegetation control and landscape management. Therefore, the preservation of those two breeds is not in doubt, despite their relatively limited population sizes.

Pigs

Pig production plays an important role in Polish animal husbandry, constituting over 25% of total agriculture commercial output. The pig number, between 18–20 million head, puts Poland in the first ten top pork producers of the world. Production intensity, at 95–105 head/ha, is of a medium level.

In 1999, the pig population amounted to 18,537.6 thousand animals, including 1,771.3 thousand of sows. The recording of performance covered only 31,377 sows, less than 1.8% of all breeding females. Among these, 51.7% constituted Polish Landrace and 34.8% Polish Large White, the two main dam breeds.

The progressing concentration and intensification of pig production resulted in increased use of commercial crossbreeding, the simple approach, including just two breeds, and, more frequently, two-stage crossing with the participation of three or four breeds. The continuous efforts to improve carcass quality, to increase meat content and enhance growth rate with better utilisation of feed, resulted in the dynamic development of typical sire breeds such as Duroc, Hampshire, Pietrain and 'line 990' at the expenses of decreasing populations of both white dam breeds. The share of the above mentioned sire breeds in 1999 was: 4.0, 3.4, 2.4 and 2.2% respectively.

These changes caused a dramatic decrease in the population of three native breeds: Puławy pig and Złotniki White and Spotted. These indigenous breeds are characterised by more fatty carcasses but, at the same time, their other values, such as high meat quality or the high fertility of the Puławy pig, are not yet fully appreciated.

Sheep

A dramatic decrease in the profitability of sheep husbandry decimated the population of this species, which now sustains only 9.4% of its number from 1990 and amounts to 392.1 thousand animals, including 246.7 thousand ewes.

The breed structure of the pedigree sheep population has also changed. Currently, the highest share of the population entered into the flock books belongs to the Polish Merino (31.6%) and Polish Lowland sheep (28.8%), with a significantly reduced percentage of the Polish Long-wool sheep (7.8%). The population of sire meat breeds however, has grown and currently constitutes 12.6%, with an additional 4.5% of synthetic lines and meat crossbreds.

The rapid decrease of the sheep population also affected two native breeds: Polish Mountain sheep and Olkuska sheep, and numerous local varieties of lowland and long-wool sheep. Only the populations of Polish Heath and Świniarka sheep did not change in numbers, although in the case of the latter, the number is extremely small. Compared to other species, genetic resources of sheep are the most differentiated – the flock books currently cover 33 breeds and varieties of sheep.

Goats

The renaissance of goat breeding in Poland, observed in the 1980s, was due to the increasing demand for goat milk as well as the social and economic transformations of that time. The goat breeding programme, abandoned during the post-war period, was re-established. At present, the goat population consists of commercial stock of unknown origin and low productivity and the significant number of imported breeding animals. In 1999, the population of goats amounted to 181.1 thousand animals, including 107.9 thousand females. Performance recording covered 3,223 of females (3% of total population only), belonging to six breed groups:

White Improved (53.0%), Saanan (14%), Fawn Improved (13,7%), Alpine (8.1%), crosses with Toggenbur goats (0.7%) and animals of unknown breed (10.5%).

Poultry

The intensification and industrialisation of production is most visible in the case of poultry production, where the continuous efforts to achieve higher numbers of eggs from laying hens or the maximum growth rate with the best feed conversion ratio in the subsequent generations of broilers, lead to the complete elimination of native breeds from intensive poultry farms. The genetic material currently used comprises hybrids of three or four genetic components. Small-scale or farm-yard production is generally based on purchased stock, as one-day old chicks from commercial hatcheries.

The poultry population in Poland in June 1999 was estimated as 51,814.9 thousand head, of which hens constituted 89.3% (including layers, 77.4%), geese 2.1%, turkeys 1.7% and the remaining 6.9% being ducks and other under-utilized species.

Polish pedigree breeding fully covers the demand of our producers for the breeding material of ducks and geese, but in the case of laying hens it supplies only 42%. The breeding material for broiler chickens and turkeys is completely imported. The commercial production is of an industrial nature; in 1999, 70% of egg consumption and 85% of poultry meat came from large-scale production.

In poultry, intensification of production and internationalisation of breeding activities provides a real threat to within-species diversity. Thus maintaining the indigenous breeds of hens, geese and ducks is extremely important since it protects genetic resources for the future development of this sector.

Fur animals

A difficult situation on the world fur market and lack of profitability caused a significant reduction of the population sizes of fur animals. In 1999, the estimated number of breeding females was as follows: 16 thousand females of common foxes, 38 thousand of polar foxes, 90 thousand mink, 1.5 thousand racoon dogs, 10 thousands of nutrias, 10 thousand chinchillas, 0.3 thousand polecats and 2 million rabbits.

The percentage of breeding females belonging to the active population is highly differentiated and depends on the species, from 3% in mink to 48% in racoon dogs. In 1999, the performance recording covered four colour varieties of common fox, with the total of 6,059 females and 9,344 polar fox females as well as 2,586 females of six colour varieties of mink, 30 female polecats and 686 racoon dog bitches. Within herbivorous fur animals, the recording scheme is carried out in 8 nutria varieties, (1,690 females), 24 varieties of rabbits (3,489 females) and three varieties of chinchillas (3,121 females).

The native genetic resources of fur animals comprises Polish colour varieties of White Necked and Pastel fox, Polish Beige Recessive chinchillas, Popielno rabbits and Domestic Polecat.

Bees

For over a thousand years Poland has been known as a "honey abundant land" taking pride in bee-keeping traditions and the fast development of modern apiculture in XIX and XX century. In the old times Poland was inhabited by bees belonging to subspecies of the Central-European black honeybee, *Apis mellifera mellifera*, extremely well adapted to local environmental conditions, including very severe ones at the north and east of Poland. The primeval, indigenous bee population was changing rapidly in the last 30 years due to the extensive importation of carnica bees (*A. m. carnica*) and especially the Caucasian bee (*A. m. caucasica*).

As a result, the black bees were almost completely displaced from the areas of their natural existence. These populations, of lower productivity, are very well adapted to the difficult environmental conditions and have a number of valuable features, such as very good wintering, careful swarm ability at the time of cold weather in spring and fast growth of families after stabilisation of weather conditions. Four local lines of black bees (Augustowska, Kampinoska, Northern and Asta lines) have been successfully preserved by bee-keepers in apiaries of Kampinos and Augustów forests and are currently included in the conservation programme. In 1999, the Polish registry books contain entries on 28 lines of Carnica bee, 8 lines of Caucasian bee and 5 lines of Central-European bee.

Bees represent important animal genetic resources, not only because of their products but first of all because of their ecological functions. Therefore, the rapid decrease of bee populations, observed in the beginning of 1990s, where the number of bee families dropped from 2 millions to 1 million, creates a lot of concern.

Fish

The animal genetic resources used and farmed in Poland include also numerous species of fish, in particular carp, and since, the 1950s, also the rainbow trout. In the 1930s Poland became the biggest carp producer in Europe, which was a driving force in the development of a genetically improved breeding stock. At present, Polish fish producers use more than twenty lines of carp and two strains of rainbow trout. They were selected from the local genetic material (Zatorski, Starzawski, Gołyski and Knyszyński carp) or from the stock derived from imported material.

Future development of aquaculture in Poland will be based on a sustainable carp production, but it will also include such valuable species as tench, grass carp, pike and two species of catfish (European and African). It is also important to increase production of 'fingerlings' of different species required for the restitution of wild fish populations in natural water bodies, especially rivers.

4.3.2. Native breeds – their value and place in the production system

Imported high-quality seed stock plays a valuable role in livestock development programmes in Poland and is widely used both for upgrading and crossbreeding. However, there are numerous native breeds and varieties developed on the basis of locally adapted genetic material, which are still kept in our country. Indigenous breeds are characterised by numerous features, which may have a substantial prac-

tical application in the future. Usually they have lower nutritional requirements and are able to utilise feed of lower quality, they are resistant to diseases, they reproduce well and express good maternal abilities, they are hardy and therefore their herd-life is much longer than the so called cultural, highly productive breeds. Moreover, very often they provide products of unique quality and value.

Puławy and Złotniki Spotted pigs are well know for high meat quality and a very good meat taste, due to the increased content of intra-muscular fat, which makes their meat very suitable for the production of cured or smoked products. Similarly, the meat of Polish Heath sheep, thanks to it special taste and aroma, which reassembles game meat, has exceptional culinary values. The milk of Polish Red cows is regarded as more tasty than the milk of Black and White cows. The eggs of hens from the Green-legged Partridge breed have specific health and culinary values because of their lower cholesterol content, and the hens themselves are very well adapted to yard or small-scale production. However, the unique high value food products provided by native breeds haven't found yet their niche markets, as this requires significant outlays for promotion and marketing.

Indigenous breeds have also many other values, for instance the pelts of Polish Heath Sheep are perfect for fur coats as they are light in weigh, very warm and durable. Olkuska sheep are characterised by exceptional litter size, up to 7 lambs in a litter, Puławy pigs have both very good prolificacy and maternal abilities. Our native horse breeds, Polish Koniks and Huculs are most useful for hippotherapy and recreation. Thanks to their good adaptation to difficult and often extreme environmental conditions, they can be kept semi-wild and used for landscape management.

It may be assumed that native breeds also have many other useful characteristics and values, which are not yet fully appreciated; and the recognition of these will be one of the conditions for their better and wider utilisation and thus provide for their successful conservation.

4.3.3. Distribution of idigenous animal genetic resources

Native breeds are kept throughout the whole territory of Poland, however in many cases there is a strict connection between the breed and the area of its origin. For example the upland type of Polish Red cattle is kept in the Małopolska region and the valley type, in the Northen-East Poland. The Hucul horses originated in the East Carpathian Mountains, while Polish Koniks are found throughout the country, in particular, in the Mazury and Wielkopolska regions. Polish Mountain sheep are connected with Nowosodecki region and Olkuska sheep, as name itself indicates, with the former administrative region of Olkusz. The Polish Heath sheep, typical of Northern-East Poland, are now also kept in Western Poland and the flock of the Świniarka breed is located in the Kielce region.

In the case of pigs, both of Puławy and Złotniki breeds are kept in their traditional areas of origin, the Lublin and Poznań regions. The protection of genetic resources of poultry, carried out mainly by the Animal Husbandry Institute, and is based at two centres, one located in Szczytno (laying hens), the second in Dworzyska (waterfowl). Furthermore, conservation flocks of poultry are kept at several Agricultural Universities. Polish varieties of different fur animal species are usually

maintained on the farms or in the areas they derive from. In the case of bees, conservation apiaries are located in the areas where local populations survived. The distribution of genetic resources of fish is strictly connected with the location of Fish Research Stations, conducting breeding work.

Native breeds are kept mainly on private farms. However, it should be emphasised, that in the case of certain species, the significant part of animal genetic resources is located also in the public sector and in particular on the experimental farms belonging to research institutes and agricultural schools and universities.

4.3.4. Threats to animal genetic resources

The necessity to adapt Polish agriculture to a free market economy, and thus the quick increase of the productivity of agriculture, forced a significant intensification of production, especially on economically strong farms, capable of rapid transformation. The intensification affected both plant production, where new agricultural technologies allow crop yields at the level of EU countries, as well as animal production, where the use of highly productive genetic material assures high performance.

The genetic resources of farm animals maintained in Poland are significant and differentiated. However the strong trend toward intensification brings about a high threat to native populations of lower productivity, especially when their other values are not fully recognised and appreciated by the market and consumers.

In particular, in the case of poultry, pigs and dairy cattle, intensification of production leads to the preference of intensive breeds, where long-term selection led to the fixation of high performance levels. These breeds, created in the conditions of highly controlled environments which allows securing of all the needs of the animals, requires high production inputs, well balanced and intensive nutrition, extensive prophylactic care and appropriate management (high-input, high-output). Only a few such intensive international breeds were created within each species of farm animals, which however, due to their value, have been spread out all over the world. At present, an unrestricted access to the best genetic material and its extensive use in Polish animal husbandry has resulted in continuous displacement of local breeds.

The present situation of native breeds was very much affected by the breakdown of the public sector in Polish agriculture, as many state and research farms used to participate in conservation efforts, having herds and flocks of local breeds. This genetic material was exposed to extremely difficult legal and organisational changes and in many cases did not survive the transformation period, being sold or slaughtered.

Another area having an impact on, and providing a threat for the maintenance of animal genetic resources, is the lack of awareness, understanding and appreciation of the many roles and values of these resources. Such lack of awareness is found in different groups of stakeholders, from decision-makers through local authorities to the general public.

4.3.5. Conservation of animal genetic resources

Legal basis

Conservation efforts to preserve native breeds of domestic animals have a long tradition in Poland, with the successful restitution programmes for Polish Koniks and Polish Heath sheep providing good examples. In many cases, the maintenance of indigenous rare breeds was possible thanks to the involvement of agricultural research institutions and financed through their scientific programmes, with additional budgetary support from the state. Ratification of the Convention on Biological Diversity in January 1996, which calls *inter alia* for the conservation and sustainable use of agricultural biological diversity, as well as the participation of our country in the FAO Global Strategy for the Management of Farm Animal Genetic Resources, initiated a concerted action in the field of animal genetic resources. In July 1996, the Minister of Agriculture and Food Economy charged the Central Animal Breeding Office with the responsibilities of the National Focal Point for Animal Genetic Resources and requested its cooperation with the FAO in this area. Following this decision, the Advisory Board and specific Working Groups on cattle, horses, sheep and goats, pigs, poultry, fur animals, bees and fish were established.

Institutional framework

The Central Animal Breeding Office, after 25 years of service, concluded its activities at the end of 2000. Since the 1st January 2001 a new organization, the National Animal Breeding Centre, established by the Minister of Agriculture and Rural Development, has taken over responsibilities in the area of animal breeding as a legal successor of the Central Animal Breeding Office. The National Animal Breeding Centre comprised three Regional Divisions with quarters in Parzniew, Poznań and Koszalin. The main field of activities includes: performance recording and breeding value estimation, publishing official evaluation results, operating milk and pedigree testing laboratories, managing data and information systems to support recording and evaluation, estimating demand for breeding stock production as well as keeping herd books, development of breeding programmes and supervision of their implementation. The NABC will also be responsible for all technical training of staff involved in breeding activities.

According to its terms of reference, the National Animal Breeding Centre was also entrusted with the tasks required of the National Focal Point for Animal Genetic Resources, so all activities already undertaken by the CABO regarding conservation and sustainable use of animal genetic resources are being continued within the new structure.

Technical programme of work

The activities undertaken by the Advisory Board and Working Groups focused initially on collecting data and information which allowed the creation of the National Database as well as providing Polish data for the global FAO database DAD-IS (Domestic Animal Diversity – Information System, http:\\www.fao.org\dad-is).

In 1999, the preparation of the National Animal Genetic Resources Conservation Programme was initiated, in which conservation objectives and priorities, as well

as conservation methods, activities and organizational framework were identified. The separate breeding programmes on the conservation of animal genetic resources of specific populations, which constitute the integral part of the National Programme, were also developed. The Minister of Agriculture and Rural Development has accepted these programmes for implementation in May 2000. Each of such programmes presents the origin and history of the breed in question, the justification for its conservation, defines conservation goals and provides a timetable of activities, as well as determining the scope of *in-situ* and *ex-situ* conservation methods. The programmes also set up recording and selection procedures and identify organisations in charge of their implementation.

In total, 32 breeding programmes to conserve animal genetic resources were accepted and these programmes include 75 breeds, varieties and strains of farm animals, as follows:

Cattle Polish Red Cattle;

Horses Polish Koniks and Hutsul Horses;

Pigs Puławy, Złotniki Spotted, Złotniki White;

Sheep Polish Heath sheep, Świniarka, Olkuska sheep, colour variety of Polish Mountain sheep, Wielkopolska sheep, Polish Lowland sheep of Żelazna and Uhrusk variety, Corriedale, Pomorska, Kamieniecka, colour variety of Polish Merino, Leine, Booroola;

Hens programme covers 10 breeds and strains: Green-Legged Partridge ZK and Z11, Yellow-Legged Partridge, Polbar, Rhode Island Red R11 and K22, Rhode Island White A33, Sussex S66, Leghorn G99 and H22;

Geese programme covers 16 breeds and varieties: Zatorska, Biłgoraj, Lubelska, Kielecka, Sub-Carpatian, Kartuska, Rypińska, Suwalska, Garbonosa, Pomeranian, Roman, Landes SD01, White Italian WD02, ND12, Slovak, Gorkowska;

Ducks programme covers 13 breeds and strains: Polish Pekin P11, P22 and P33, Mini Duck K2, Khaki Campbell Kh1, Danish Pekin P8, English Ducks A1, A2 and A3, French Pekin P9, Orpington O1, KhO1, synthetic group A;

Fur animals White Necked Fox, Polish Pastel Fox, Domestic Polecat, Polish Beige Recessive Chinchilla, Popielno White Rabbit;

Bees lines of *Apis mellifera mellifera* including North Bee, Asta, Kampinos Bee and Augustów Bee;

Fish Rainbow Trout strains of spring and autumn spawning; Carp lines of Gołysz, Knyszyn, Ukraine, Lithuania, Starzew and Zator.

Table 10 (see Annex) presents summary data on all populations of animal genetic resources, which are included in the conservation programmes.

Implementation of animal genetic resources conservation programmes has been entrusted to Polish Sheep Breeders' Society (sheep and goats), Polish Horse Bre-

eders' Association (horses) and the National Animal Breeding Centre (all remaining species). It is expected that in the very near future other Breeders' associations/organizations will take over responsibilities regarding the keeping of herd books and implementation of breeding programmes. The first step, undertaken last year, included all three native pig breeds.

The conservation programmes are carried out successfully till now, with farmers being involved in their implementation on a long-term, contract basis. Animal genetic resources programmes will allow restitution and maintenance of valuable native breeds, varieties and strains of farm animals, which testify to the history of Polish animal breeding and may provide a significant contribution to future development of animal production in Poland.

Financial support

Since the 1960s, genetic improvement of livestock and conservation of farm animal diversity has been financially supported by the Ministry of Agriculture. Every year, in a special regulation issued by the Minister, both the level of support, and a scope of activities eligible for support has been announced.

In the case of animal genetic resource conservation, the number of females within each population (herd) eligible for support, as well as the premium level per head, are provided in this annual regulation. Additionally, the activities carried out in this area by the CABO and currently the NABC are identified and provided for. In 2000, the budget planned for co-ordination and supervising of conservation activities amounted 133,800 PLN.

The premium paid for each female included in the conservation programmes varies depending on the species in question and takes into account the general profitability of production, maintenance costs and farmers' perception of the level of support. This premium should contribute to maintenance costs and should make up for lower productivity of native breeds and the additional labor connected with breeding work carried out within a herd or flock. In 2000: Polish Red cows were entitled to support of 1100 PLN per head; mares of Polish Koniks and Huculs to 430 PLN; sows of Puławy and Złotniki breeds, 550 PLN; while ewes of all breeds/varieties to 110 PLN only. Geese and ducks were given 58 PLN per head while lying hens received 13 PLN. Fox females were provided with 120 PLN while remaining fur animal species with 50 PLN per female. Carps and rainbow trout were provided with 50 PLN per female spawner, while each bee family was supported by 70 PLN (1 EUR = 3,7 PLN , 29.10.2001).

The financial support, provided by the state budget is perceived by most farmers as too low to serve as an incentive. An additional concern is it's decrease over time. In 2001, the total budget for genetic improvement has been decreased by 19%. Moreover, the relevant regulation is issued annually and signed very late by Minister, usually in March, which creates additional anxiety and concern.

International co-operation

Poland is actively involved in international cooperation in the area of animal genetic resources, contributing to the development of the FAO work programme, being a member and presently chairing the Intergovernmental Technical Working

Group on Animal Genetic Resources for Food and Agriculture, a subsidiary body to the FAO Commission on Genetic Resources for Food and Agriculture.

The National Focal Point has participated in establishment and supports activities of the European Regional Focal Point, located in the Bureau des Ressources Genetiques in Paris. The National Focal Point has been also involved and contributed to development of regional programmes on AnGR, discussed during a workshop of Baltic and Nordic countries.

4.3.6. Further opportunities

Although the conservation programmes have been developed, and have already entered the implementation phase, the legal basis for animal genetic resource conservation and sustainable use are not established in a satisfactory way. The new breeding law, of 20 August 1997, on the organization of animal breeding and reproduction, which came into force on 9 April 1998, has no paragraph, which directly and specifically addresses animal genetic resources.

In the first chapter, article 1, it is said that "the law regulates matters related to breeding and conservation of animal genetic resources, performance recording and breeding value evaluation, herd book keeping, as well as supervision over breeding and reproduction of farm animals". It is the only place in the breeding law, where AnGR are directly mentioned. The interpretation of this article is such that all further articles also have respect to animal genetic resources. However, this device is not satisfactory; therefore an anticipated amendment of the breeding law will provide an opportunity not to be missed for incorporating better reference to issues on AnGR conservation and sustainable use.

Another opportunity for mainstreaming, and further consolidation and enhancement, of AnGR activities should be forced by the adoption of the National Biological Diversity Strategy, which has been through consultation and is approaching a final stage of preparation. This Strategy makes provisions for development of sectoral strategies and action plans, in our case a National Agro-biodiversity Strategy. Development of such a strategy will provide a legal framework for all activities in the area of conservation and sustainable use of agro-biodiversity and will enable better cooperation between all institutions, organizations and stakeholders. It will also contribute to fulfilling the national obligations regarding implementation of the work programme on agricultural biological diversity of the Convention on Biological Diversity as adopted by decision V/5.

4.3.7. Final remarks on animal genetic resources

It is clear that Poland is well advanced in the area of conservation of animal genetic resources, many indigenous breeds being for years included in conservation/ restoration activities and the national conservation programme being approved by the Ministry of Agriculture and Rural Development. However, the legal basis for these activities is not satisfactory, and requires strengthening, wherever possible. Another area requiring adjusting and tiding up relates to financial support. At present, financial support for AnGR conservation consists of a small share of the overall state support for animal genetic improvement, while it would be much better and effective if such support was granted in a separate regulation.

For some time there has been on-going discussion on the possibility of establishing an agro-biodiversity fund, to support all activities in this field, concerning plant, animal and other components of agro-biodiversity. Development of the National Agro-biodiversity Strategy should support and speed up implementation of such proposed solutions.

4.4. Legislation

4.4.1. The state of legislation

The Constitution of Poland contains Article 12, par. 2, devoted to nature protection, which states 'that the state secures protection and a rational management of the natural environment, which is a common property'. Article 71 also proclaims 'a citizen's right to take advantages of the natural environment and requiring the duty of its protection.

The acts concerning the environment may be divided into three groups:

1. Acts devoted specially to the questions of environment protection: the 1980 Act on Protection and Management of Environment and the 1991 Act on Nature Protection.
2. Acts regulating management of particular elements of the environment, including also the problems of its protection: the 1991 Act on Forests; the 1982 Act on Protection of Agricultural and Forest Grounds, etc.
3. Acts partially concerning problems of environmental protection which regulate various aspects of social and economic life: for example the 1989 Act on the Local Government etc.

The basic law normalizing protection and management of the environment is the Act of 31 January 1980 (consolidated text Journal of Law from 1994 No 41, item. 196 with later changes). This act also qualifies requirements for the protection of the environment from injurious factors affecting soils, water and air, and also the requirements for protection of each component of nature.

The especially essential articles of this act have been introduced from the act of 29 September 1997 about changes to the law about protection and formation of the environment and changes of other regulations (Journal of Law No 133, item. 885). These records widen the requirements placed to elaborate studies and local management plans in areas relating to the protection of biological diversity, and also define, in this regard, detailed requirements for management of different elements of the environment: for example, when preparing and executing engineering works relying on the regulation of water levels or the building of flood defences, the need to maintain the biological diversity of the river valley and of especial areas in a natural state of equilibrium, must be taken into account. Similar recording refers to reclamation works. Solutions to these dilemas are especially important in Polish circumstances, where significant natural wealth remains in many river valleys and on boggy areas comparatively little transformed by man.

Also very important is the introduction of Article 37a on 'rules of conduct with genetically modified organisms (GMO)'. This article partly removed a legal gap

relating to the requirements of the Biodiversity Convention. However, these regulations do not properly take into account the complex nature of this problem, as well as the range of necessary research and their practical utilization.

Detailed activities about the protection of biological diversity were enforced in Law from 16 October 1991 about the preservation of nature (Journal of Law No 114, item. 492 with later changes). The law (art 2.2) defines, among other things, that the aim of the preservation of nature is:

- Maintenance of ecological processes and stability of ecosystems;
- Maintenance of biodiversity;
- Assurance of geological heritage;
- Maintenance of the continuity of existence of plant species or animals, together with their habitats, or restoring them to a proper state;
- Holding, or restoring to a proper state, natural habitats, and of also other resources of nature and it components;
- Developing proper attitudes of people with respect to nature.

However, there are nevertheless gaps in the above acts, among other things: legal protections for landscapes; regulations about seed production of forest trees; and also the need to take environmental problems into account when preparing other laws or programs of work, and the requirement for estimations of their influence on environment problems and the protection of biological diversity.

Similarly, other acts have inter-relationships with the protection of biological diversity: for example problems in the use of natural resources or to leadership of economic activity in natural environment. These are among others: Geologic Laws, Mining Laws, and Water Laws.

At present, in all state agencies, intensive work on the unification of legislation is going on, also in the area of protection of biological diversity, with legal rules, which become obligatory for Poland at the moment of integration with the European Union. Special pressure is put on the following aspects as having immediate influence on the state of biological diversity: preservation of nature, agriculture, forestry, spatial management, water management, marine management, tourism, etc. In accordance with an obligatory approach in the EU, protection of biological diversity will demand the elaboration of a complex system of legal acts, creating mechanisms for effective implementation, together with monitoring to ensure compliance with the law, and also containing recommendations relating education, scientific evaluations, etc

Government and municipal administrations, at regional and local levels, are increasingly responsible for the protection and sustainable use of biological diversity, with respect to environmental protection and spatial management. In the last few years, ecological NGOs (local, national and international) have increasingly become more and more serious and significant partners of the public administration, with regard to activities for the protection of biological diversity.

During an international conference organized by United Nations Environment and Development (UNICED) in June 1992, in Rio de Janeiro, Poland signed the Convention on Biological Diversity.

Ratifying the Convention in 1996, Poland has become a party to the Convention and accepted all obligations resulting from this important document, noting that its premises, which form the basis of the Convention, refer considerably to realities affecting Poland, especially the following facts:

- the biological resources of a country decrease gradually (deterioration of ecosystems, extinction of wild species, and races of domesticated),
- hitherto existing forms and methods of preservation of nature are not fully effective,
- A lack of systems for identifying, and sharing, the benefits coming from possessing and wisely using biological resources.

In the light of accepted obligations, each country is obliged to work out a national strategy, plans and programmes relating the protection of biological resources and their sustainable use; these include, in due measure possibilities and if necessary, protection of biological resources and sustainable use of their elements in sectorial economic plans, programs and strategies.

An amended Law on the preservation of nature (amendment from 7 of December 2000) introduced a duty of preparing, by the proper minister, a 'National strategy of protection and sustainable use of biological diversity' (art. 34.2). The Board of Ministries in the New ecological policy of the state undertook the same obligation in August 2000.

4.4.2. Proposed National Strategy for the Protection of Biodiversity

The 'National strategy of protection and sustainable use of biological diversity' is addressed first of all to government administrations at different levels and to municipal authorities, which directly manage biological resources, or can have a significant influence on its state. Simultaneously, the Strategy is addressed to all policy makers, supporting organizations and all societies, as part of a strategy for the whole country.

In previous years a set of strategic documents has been prepared relating to the social and economic development of the country, and to the management of the environment. The most important documents are:

- Poland 2025 – Long-term strategy of permanent and sustainable development (accepted by the Board of Ministries on 26 July 2000);
- New ecological policy of the state (Ministry of Environment; accepted by the Board of Ministries on 13 June 2000);
- National Strategy for protection of the environment (Ministry of Environment, 2000).

The national strategy of protection and sustainable use of biological diversity, most widely behaves as a 'New ecological policy of the state'. In the document it has been ascertained, that the protection of biological diversity and landscape are important areas of ecological safety of the country. One of the goals is the creation of conditions favourable to the protection of biological diversity. The most important aims are:

- Realization of a strategy for the sustainable social and economic development of the country;
- Improvement of the environment by limitation of threats to the conservation of biological diversity and the landscape;
- Conservation, reintroduction and enriching of the diversity of nature;
- Achievement of wide acceptance for the maintenance of the whole natural and cultural heritage of Poland.

The enforcement of the 'New ecological policy' creates a profitable legal environment, institutional and organizational, for initiating the 'National strategy of protection and sustainable use of biological diversity'.

The New ecological policy of the state has defined also the main directions of activities, and aims for the protection of biological diversity, partitioned into three temporal sections: short-term, to year 2002, medium-term, to 2010 and long-term, to 2025.

Urgent short-term aims are:

- Elaboration and acceptance of the 'National strategy of protection of biological diversity' as realized obligations coming from the Convention;
- Inclusion of settlements of the strategy into branch programmes and strategies in the spheres of: agriculture, forestry, tourism and recreation, spatial management, transportation, water management, sea management, education, and culture;
- Inclusion of settlements of the strategy into programmes of sustainable development and protection of the environment, prepared at regional level;
- Linking several present departments into a single governmental organization responsible for sustainable development and protection of the environment;
- Appointment of an 'Office of Main Conservator of Nature' as an agency superintended by the Ministry of environment;
- Strengthening of services for the preservation of nature acting at central and local levels, and in national parks;
- Organization at local level of cells, or of positions, responsible for the protection of biological diversity.

Medium-term aims in the area of agriculture are:

- Monitoring of re-gaining biological resources from their natural habitats for the needs of *ex-situ* conservation;
- Enforcement of legal rules regulating biological safety of the countryside, and assurance of financial sources for risk assessment coming from the use of biotechnology;
- Activities for the maintenance of varied agricultural landscapes of medium size;
- Legal and financial support of the forms of agriculture that use methods of production that do not disturbe the natural equilibrium, first of all ecological and integrated agriculture;

- Protection and management of biological diversity on the whole territory of the country; Protection of many species and their natural habitats depends on the method of maintaining the whole environment where they live;
- Maintenance of traditional agricultural practices in precious natural regions, as tools for the protection and sustainable utilization of biological resources;
- Holding back from the introduction of alien species, which can threaten the natural integration of ecosystems and of habitats, or can threaten native species.

Based on elaboration of the present Strategy, several of projects prepared by different institutions, and presenting different points of view or relating to selected elements of biological diversity have been agreed. Especially important are:

1. Strategy for the protection of living resources of nature in Poland (Ryszkowki, Bałazy 1991);
2. Author's versions of the strategy of protection of biological diversity (Cieślak 1995, 1999);
3. Project of National strategy and plan of action for protection and rational use of biological diversity (NFOS, 1998).

The following subjects for agriculture are formulated in the Strategy:

1. Elaboration of a national strategy for the protection of agricultural biological diversity (agro-biodiversity) embracing protection used by man, agricultural ecosystems, genetic resources of cultivated plants, and domesticated animals and wild species and their natural habitats.
2. Elaboration of programme for the protection of threatened plant varieties used in agriculture, which have to specify: methods of protection, minimal size of population, conditions of storage of genetic material in gene banks.
3. Creating the institution of the National Bank of Plant Genetic Resources, which will be responsible for initiation and monitoring of complex programmes of protection *ex-situ* genetic resources of genetic plants, wild and cultivated.
4. Elaboration of a national programme and regional programmes for the protections of population for threatened native races of farm-animals, which have to specify, which methods of protection have to be used with reference to given races.
5. Qualification in programmes of protections the needs of each race of animals and range of usage of cryoconservation and delimitation of institution responsible for leadership of *ex-situ* banks.
6. Preparation of a programme for the diversification of agricultural crops and creations of markets local products for originating from them.
7. Support for production and introducing onto the market of brand-name products originating from protected populations of animals.
8. Elaboration and initiation of system of encouragement and of financial compensations for the undertaking of agri-environmental activities.

9. Elaboration of a Code of Good Agricultural Practices for protection of biological diversity.
10. Introduction of training programmes for farmers about good agricultural practices and the protections of biological diversity.
11. Delimitation of areas used in agriculture which have unique natural values.
12. Elaboration of national programmes of management and protection of sensitive areas from changes of farming methods, especially in mountainous areas.
13. Estimation of the influence of letting fields lie fallow, and of abandoning grass-lands, on the biological diversity, and preparation of programmes of management.
14. Realization of obligations resulting from international agreements and European obligations, in this regard, especially: resulting from Global Plan of Action FAO and active participation in programmes of the European Community.

Present legislation on seed production also limits the maintenance of 'landraces'on farms. The commercialisation of 'Landrace seeds' is discouraged by both the 'Intellectual Property Rights' held on defined varieties and by the need to meet the International Union for the Protection of New Varieties of Plants (UPOV) standards (especially considering uniformity) to obtain the status of a variety.

The present Seed Industry Law, introduced in 1995, is more restrictive with regard to the commercial use of local and obsolete varieties than the previous one. In Poland any variety, in order to be used commercially, has to enter the Register (Polish National List). Criteria for registration are well known – distinctiveness, uniformity and stability. These requirements in practice preclude anything other than breeding material from registration. The Register lists 302 cultivated plant taxa of economic importance. A 'landrace' belonging to one of those 302 taxa cannot be registered and therefore cannot be put on the market, as, by definition, it does not meet uniformity standards.

There is, however, a group of plants for which cultivars do not need to be entered in the Register and thus their commercial use is much less restricted. First of all, the name of the variety does not need to be known and its seed material that is made available for trade must only meet sanitary and sowing value requirements specified by Polish standards. Moreover, the requirements for certified seed established for registered varieties are not applied to this group. Therefore 'landraces', obsolete varieties and other kinds of plant genetic material, such as populations, could be commercially utilized within this category of plants.

New amendment to the Seed Industry Law currently in force, will include a new category of varieties "local populations". A list of local populations will be published by the Ministry of Agriculture. This is first step to official recognition of 'landraces' and obsolete varieties in our agricultural system. However a framework needs building for their registration and marketing.

We consider that rules to be established for the trade of local and obsolete varieties or other kinds of PGR should include the following conditions:

1. Seeds of the local or obsolete varieties could only be put on sale by the farmers/producers of seeds.
2. The farmers/producers of seeds could only sell them from their own farm or at the local market.
3. Commercial seed material from a local or obsolete cultivar would have to be accompanied by the seed quality certificate obtained from the Seed Testing Laboratory of the Seed Inspectorate, which is the government agency responsible for testing seed material.
4. If the trade takes place outside the farm, the farmer/producer of the seed material would have to display (in writing) to buyers of seed his name and address as well as the name of the variety, information about it and the fact that the seed is not certified.

The reception and application by state members of Directive 98/95/CE of the Council of European Communities of 14 December 1998, may solve problems related to 'landrace' seed commercialisation in Europe. Nevertheless, after reception its sound implementation would need a list (Register) of existing landraces to be compiled after extensive regional surveys to investigate and evaluate the situation. The Register would: firstly permit acknowledgement of the existence of autochthonous material belonging to different agriculture areas which are peculiar for biodiversity and local knowledge, traditions and history of inhabitants, etc; secondly offer a basis for taking appropriate safeguards.

The urgent need for rural development in the pre-accession countries has been recognized by the European Union in the structure of the main aid programmes under Agenda 2000. These include one programme, SAPARD, which is aimed directly at agriculture and rural development. Three other programmes – PHARE, ISPA and INTERREG – can be used to some degree for the funding of rural development.

Agri-environmental programmes

In Poland there is no organizational system responsible for achieving the long-term agri-environmental programmes, comparable to those ongoing in the European Union. Subsidies are for ecological farming, conservation of genetic resources of plants and domesticated animals and analysis of soil to indicate the requirement for fertiliser use. However, rules about giving subsidies are distant from those required by the EU. The overall aim is the preparation of targeted agri-environmental programmes, which will reach full range of initiation after integration of Poland to European Union. In the pre-accession phase agri-environmental programmes will be tested in the form of pilot projects in the framework programme SAPARD.

The starting of pilot agri-environmental programmes at selected sites will be possible after confirmation of the programme by the European Commission and after authorization of the 'Code of Good Agricultural Practices' by the Ministry of Agriculture and the Ministry of Environment.

The tasks of the national agri-environmental programme were worked out in accordance with requirements of the EU (Council Decisions 1257/1999 and 1750/1999).

General tasks:

- Diminution of the consequences of intensive agriculture that are injurious to the environment, or the long-term wasting of agricultural land from farming uses.
- Diffusion of good agricultural practices, and the increase of 'ecological culture' among rural communities.
- Maximization of profitable environmental effects resulting from integrated, extensive and ecological systems of agricultural production.
- Conservation or restoration of the natural values of key habitats and traditional forms of their use, with the aim of maintaining the biological diversity of agricultural areas.

Detailed tasks:

- Assurance of circumstances for the survival of populations of threatened species, which have developmental needs dependant on the *traditional* agricultural landscape and methods; in the case of species showing considerable decreases of population sizes during the last 20 years, the halting and reversal of those declines.
- Increased retention of natural water resources, and the counter-action of pollution of ground and underground waters.
- Counteraction of the degradation of soils as a result of water and wind erosion.
- Maintenance of traditional crops and races of domestic animals (genetic resources).

Local environmental priorities should be defined, individually, for each region and should be implemented by long-term plans of environmental protection and nature conservation for each voivodship. Priorities should be based on the ranking of areas of initiation of agri-environmental programmes, and also be a starting point for qualifications for the rules for the selection of applications.

Criteria for the choice of key-areas to develop agri-environmental programmes result from the estimation of the natural values of different types of agricultural landscape and from estimations of the degrees of threats to them. The most important criteria are acknowledged as:

- Species of plants and of animals threatened with extinction because their life-cycles depend on agricultural methods and areas of traditional (extensive) systems of cultivation.
- Species threatened with extinction by transformation of the character of habitats, agrocenosis having conspicuously high degrees of species variability, and playing key functions in the agricultural landscape.
- Structural elements within the agricultural landscape, worthy or maintenance because of their cultural functions, both natural and aesthetical.
- Rich mosaics of small fragmented fields within agricultural landscapes which promote the survival of many key-species, and which are threatened by transformation into 'crop mono-culture' landscapes.

- Counteraction to threats of agricultural productive space caused by water and wind erosion, water pollution and the decrease of the natural level of surface--water.

Structure of agri-environmental programmes

The National agri-environmental programme will consist of the three following schemas:

- Conservation of biological variability in agricultural areas.
- Conservation of environment and of agricultural landscape.
- Development of ecological agriculture.

Schema 1. Conservation of biological variability in agricultural areas – will be initiated on special areas with unique natural values. An aim of activities in the scheme will be first of all the protection of biological diversity (natural and semi-natural agrocenosis) threatened with transformation. Every selected area will possess a specific structure of environmentally precious agrocenosis, whose maintenance will depend on the continuation of traditional forms of agricultural use. The schema will be introduced in protected areas, the protective buffer zones of these areas and lands outside the system of legal nature reserves, which also realize the accepted criteria.

Schema 2. Protection of the natural environment and countryside will be initiated for the territory of the whole country. The outline schema foresees the maintenance and restoring of natural values, protection of genetic resources accumulated in landraces under cultivation and of races of farm-animals, formation of structure of landscape, counteraction of erosion and increase of natural water retention etc.

Schema 3. Development of organic agriculture and rules for organic agriculture on all farm. Payments will comprise 2 and 3 year periods for shifting to methods of organic agriculture and three years after obtaining a certificate for the farm.

4.5. Influencing agriculture policy for biodiversity conservation

Land used for agricultural production, which covers about 60% of the country (18,650,000 ha) are subject to intensive ecological processes impacting upon the conservation of biological diversity. Family farms, covering just a few hectares and with limited capital, are dominant. These have traditional methods of management and are of low productivity. It has been estimated that only 30% meet European food production standards, though this is a favourable situation from the ecological point of view since it has allowed many areas to retain high biological diversity in both the agrocenoses themselves and in agricultural zones as a whole. Recent years have seen agriculture transformed to meet to the conditions of a market economy.

The sectors which have major influences on agriculture policy are agriculture and the environment. In both sectors a set of important activities has been undertaken,

which have influenced the maintenance of biological diversity. These are strategies, legislative initiatives and operational programmes.

The basic objectives of agricultural policy, which is aimed at a permanent transformation of rural areas and agriculture, are set out in the Medium-Term Development Strategy for Agriculture and Rural Development (1998). The Coherent Structural Policy for Agricultural and Rural Development is a more detailed development of the Medium-Term Strategy for Agriculture and Rural Areas and is focused on structural changes of rural areas and agriculture within the period of 2000–2006. The Policy will be implemented by a number of operational programmes, including the SAPARD Programme (Community Support for Pre-accession Measures for Agriculture and Rural Development in the Applicant Countries of Central and Eastern Europe in the Pre-accession Period). The targets of SAPARD programme "restructuring the agrarian sector" and "sustainable development of rural areas, protection of the natural environment and cultural heritage" can have a direct influence on biodiversty.

In the sector of protection of the environment a set of initiatives has been undertaken, which refer to the environment, in this context to areas used by agriculture. Strategic documents relating to the social and economic development of the country, and to the management of the environment have been prepared. The most important document, referring directly to biodiversity, is the New Ecological Policy of the State (2000). In the document it has been ascertained that protection of biological diversity and the landscape are important areas of ecological safety for the country. One of the goals is the creation of conditions for favourable protection of biological diversity. The enforcement of the New Ecological Policy of the State creates a profitable legal environment, both institutional and organizational, for initiating of the National Strategy of Protection and Sustainable Use of Biological Diversity, which will determine, with other 12 strategies, tools for realising the Policy.

As urgent short-term aims have been defined, development and acceptance of the National Strategy of Protection and Sustainable Use of Biological Diversity, as the realization of obligations coming from the Convention, requires inclusion of operational tasks of the strategy into branch programmes and strategies in the spheres of: agriculture, forestry, tourism and recreation, spatial management, transportation, water management, sea management, education, and culture.

The legal basis of development, and also in the future implementation of the National Strategy of Protection and Sustainable Use of Biological Diversity, is article 35.2 of a recently amended Act on Preservation of Nature, which binds the Minister of Environment to prepare a National Strategy of Protection and Sustainable Use of Biological Diversity, together with a plan of action.

An operational task formulated in the Strategy embraces related aims, both *ex-situ* conservation and *in-situ*. Formulated assignments are especially important for the realization of agri-environmental programmes. The operational tasks of the strategy will be subject of discussion with the agricultural sector.

Recently created or amended acts create legal a environment for biodiversity conservation and biosafety.

New amendment of the Seed Industry Law, currently enforced, includes new category of varieties "local populations". A list of local populations will be published by Ministry of Agriculture. This is first step to official recognition of 'landraces' and obsolete varieties in our agricultural system. However a framework needs building for their registration and marketing.

The introduction of article 37a, into the law about the protection and formation of environment and changes of other regulations (Journal of Law No 133, item. 885) is very important, on rules of conduct with genetically modified organisms (GMO). This partly removed a legal gap relating to requirements of the Biodiversity Convention. Currently a new act has been prepared "On Genetically Modified Organisms", which will be enter into force at the end of 2002.

On 1 February 2001 Parliament accepted the Act on Ecological Agriculture. The law supports usage of crop rotation and other of natural methods of retaining or increasing biological activities of soil; selection of species and cultivars of plants and of races of animals, which should take into account their natural resistance to diseases; peculiarities from landraces of plants and local races of animals should be used. The Act on Protection of Agriculture and Forest Lands limits the intended use of land for other purposes than agriculture and forestry.

The basic legal act normalizing protection and formation of the environment is the Act of day 31 of January 1980 (consolidated text Journal of Law from 1994 No 41, item. 196 with later changes). This act also qualifies requirements about the protection of the environment from injurious factors for soils, water and air and also the requirements for protection of each component of nature.

In the above acts there are nevertheless gaps, among other things in the range of legal protections for landscapes, which needs taking into account in preparing estimations of influence on environment problems of protection of biological diversity, or legal status of plant genetic resources.

The planed Budgetary Law for Agriculture for 2001 takes into account enlarged expenditure on agriculture connected with the necessity to adjust Polish agriculture towards the European Union's. Among other biological progress, developments in plant and animal production and organic agriculture will be financed from the fund, provided by the Minister of Agriculture. In the projected budgetary law for the year 2001 there are included funds originating from European Union on implementation of PHARE programmes and the SAPARD programme.

Sources from the fund of biological progress in agriculture and of animal production are mostly directed, in accordance with statutory destination, to increase production by increasing the productivity of new cultivars. They are intended for a limited number of key species, and other minor species are not supported financially. This could turn around the positive recent tendency of increasing the number of cultivars in the National Register.

Poland is well advanced in the area of *ex-situ* conservation of plant genetic resources, as a national network of plant genetic resources has been established. The national programme is co-financed by the Ministry of Agriculture and Rural Development. However the annual basis of its finance, lack of funds for investments and the lack of a legal basis for these activities are not satisfactory. At pre-

sent, financial support for the conservation of genetic resources is coming from the same fund as biological progress in plant and animal production, and is decreasing gradually, according to approved rules for the whole fund. Effective and stable support for plant the conservation of genetic resources could be granted by separate regulation.

The basis for the formulation of the SAPARD operational programme is the National Programme of Preparation for EU Membership (NPAA), which identifies, among others, environmental aspects of agriculture. The 'Agri-environmental Measures and Afforestation' are considered as complementary axes of the SAPARD programme. Under Agri-environmental programmes payments will be made to farmers which will allow for the requirements of environment. Analyses to determine the amount of payment for farmers who participate in the agri-environmental measures have not been completed yet. They will be continued in the first stage of implementation of the pilot programme.

Development of a single National Agri-environmental Programme has been planed, comprising elements from three schemes:

1. Conservation of biological diversity in agricultural areas;
2. Conservation of the environment and the agricultural landscape;
3. Development of ecological agriculture.

It should be stated that all members of European Union are obliged to initiate agri-environmental programmes in legal frames define by Council Regulation 1257/1999.

Agri-environmental activities comprise 14% farms in the European Union. Contracts embraced over 27 million hectares (19.5% of agriculture land in European Union). In Poland according to natural conditions, the scale of the programme should be even wider, up to 60% of the agriculturally used territory of the country.

Poland has specific conditions for biodiversity conservation:

Environmental conditions

- Agricultural lands are major forms of land use;
- Rural areas are more rich in natural values than in neighbouring countries;
- Existing system of nature protection cover 31% of Poland;
- Poland's location, on the border between Atlantic and continental types of climate, secures high diversity at all levels;
- The mosaic of small, fragmented fields and the extensive methods of farming.

Economical conditions

- Lower technical level of agriculture;
- Difficult economic situation for farmers;
- Necessity of deep structural changes in agriculture.

Other

- Developed system of *ex-situ* conservation;
- Important changes in the legal system;

- Implementation of agrienvironmental programmes.

As agri-environmental programmes at present determine the single and main mechanism of initiation of protection of biological diversity on agricultural areas, the acceptance at governmental level of 'The Code of Good Agricultural Practices' is necessary. The official approval of the code is an indispensable condition to the start of the pilot programmes.

The main problem for Polish agriculture is the very difficult economic situation, which drives farmers to use any methods likely to rapidly improve the situation in agriculture. The formation of large farms and intensification of production is supported, what can quickly polarise changes, causing economic development of some regions but marginalization of areas where conditions for agricultural are difficult. Alternatives are agri-environmental programmes, which will support the sustainable development of agriculture and conservation of the environment.

Conservation of biodiversity in the agricultural environment is a very new task for biodiversity conservation. The following studies have been considered as important for action in agricultural environments:

- regional inventories and characterisation of landraces and old cultivars grown on farms,
- studies on the management and conservation of sensitive areas,
- delimination of areas used in agriculture with unique natural values,
- studies on the effects of abandoning arable lands and grasslands on biological diversity,
- studies on the use of landraces in organic farming,
- ethno-botanical and socio-economic research,
- research and extension studies for little known crops, including seed production, marketing and distribution.

At present all state agencies are undertaking intensive works on unification of legislation, also in the area of protection of biological diversity, with legal rules, which become obligatory for Poland at the moment of integration with the European Union. Special pressure is put on the spheres having immediate influence on the state of biological diversity, such as agriculture. In accordance with the obligatory approach of the EU, protection of biological diversity will demand the elaboration of a complex systems of legal acts, creating mechanisms for effective implementation, together with methods for monitoring compliance with the laws, and containing also recommendations relating to education, science, etc.

The Act about 'Access to Information about the Environment and its Protection' and the 'Assessment of Influences on the Environment' (Dz. At. 2000. 109. 1157), requires that projects, policies, strategies and plans of any programmes (especially agricultural demand), assess their influence on the environment. The Medium-Term Strategy for Agriculture and Rural Areas, as a governmental strategic document, should be subject to assessment as regards its environmental impact.

The protection and sustainable use of biological diversity increasingly requires government and municipal administration at regional and local level in respect of protection of the environment and spatial management. In the last few years new

and increasingly important and significant partners of public administration, in the sphere of biological diversity protection, have arisen in the form of local, national and also international pro-ecological non-governmental organizations (NGOs).

Conclusions:

1. The areas of agricultural production cause intensive ecological impacts upon the conservation of biological diversity.
2. The proposed solutions at strategic levels are coherent.
3. The proposed legal solutions, especially at the stage of their implementation, must to a greater extent, take into account the needs of conservation of the environment.
4. The threats to biological diversity can be moderated by agri-environmental programmes.
5. Agri-environmental programmes must be strengthened by the development of suitable research and by the acceptance of the indispensable legal framework, in particular the legal status of the 'Code of Good Agricultural Practice'.
6. In Poland further work is needed on the elaboration and initiation of the 'National Biodiversity Safety Framework' based on legal settlements and international experience. Polish solutions are coherent with the system accepted in European Union.

Appendix Poland 4.1

Targets for the Coherent Structural Policy for Agriculture and Rural Development

T.1. Creation of adequate working and living conditions in rural areas so as to allow rural people to achieve their economic, educational, cultural and social potential

T.1.1. Development of physical infrastructure

An improvement in physical infrastructure is a basic pre-requisite for the success of rural development programmes.

According to the present regulatory framework, local and regional authorities are given responsibility to select and partly finance new investments. Supplementary funding from the national budget is provided for specific investments in accordance with operational programmes. Detailed conditions for supporting improvements in infrastructure facilities will be specified in future operational programmes.

T.1.1.1. Water supply and sewage systems

Increasing access to water supplies, together with a rapidly growing number of collective water installations, results in an increased amount of sewerage and drainage requirements. A balanced development of water supply, sewage and sewage treatment systems, is required as follows:

- construction of collective water facilities so that 70–75% of farms are supplied with a sufficient amount of good quality water,
- installation of adequate water treatment equipment on the remaining 25–30% of farms that have separate domestic water intakes or supply systems,
- modernisation of existing water treatment plants,
- construction of farm sewage treatment facilities on about 60 to 70% of farm holdings,
- construction of sewage collection networks with common sewage treatment plants for about 30–40% of farm holdings located in densely populated areas,

- construction of a dispersed network of sewage treatment plants with intake points to collect sewage from farm holdings and agricultural and food processing plants.

Public support for the development of water supply and sewage systems will be given by means of grants paid in instalments (in advance and on completing an installation). Beneficiaries may include local authorities of one or several communities (collective projects) as well as individual households for on-farm facilities. Public support is provided on condition that beneficiaries secure their own contribution as set out in the operational programme.

The public contribution will vary regionally according to the existing infrastructure, community revenue and the extent of the participation of beneficiaries in the investment works.

T.1.1.2. Solid waste management

Appropriate measures will be implemented jointly by the Ministries of Agriculture and Rural Development and Environmental Protection. In the medium-term, it is intended to build new dumping sites for over 2,000 communes, and to fence and seal off 1,650 existing ones. Special stations for the recycling of packaging and unused pesticides will also be established.

The construction and modernisation of waste management and treatment facilities within villages, communes and larger regions, will be supported with public subsidies granted mainly to commune and district administration boards. Subsidies will be given only for construction and modernisation of official dumping sites equipped with isolation screens and which guarantee collection of any seepage and other forms of pollution.

Waste management investments will be financed from:

- the budgets of local and regional authorities
- funds and foundations dealing with environmental protection,
- the state budget,
- farmers, rural dwellers and companies etc. intending to use the dumping sites,
- other funds, including foreign aid.

The rate of public support will be defined in the operational programme.

T.1.1.3. Development of telephone network

The programme aims at providing telephones on 85% of farms by 2005.

To this end multiple technology will be used, such as stationary telephones, radio telephone systems and cellular telephones. Adequate telecommunication infrastructure to provide rural schools with access to the Internet is also vital.

Investments in the telephone network will be financed mainly from the resources of Polish Telecom (TP S.A.) and licensed operators. Since rural telecommunication systems are expensive and bring low returns, some support can be provided to private operators in the form of incentives for the establishment of organisational structures such as legal persons (non-profit, for the period of investment only) and

supplementary funding by rural people, local self-government authorities and foreign aid.

Funding from foreign aid earmarked for telephone networks is under the supervision of the Government Representative for Rural Telecommunications.

T.1.1.4. Sources of energy

The main intention of the programme is to modernise and develop the existing power supply network as well as to increase the number of users of gas for household and production purposes. A further aim is to develop alternative energy sources such as bio-gas and wind power. The availability of electricity and gas is a prerequisite for improving both living and working conditions. Unlike coal, these sources are environmentally friendly. At least 20,000 km of medium – and low voltage rural lines and about 5,000–5,500 transformer stations per year are expected to be upgraded. This scale of annual renovation for five years will just be sufficient to prevent further overall deterioration of the rural power network and to develop other infrastructure.

Public support can be given for the construction and modernisation of: the power supply network in rural areas (re-electrification), the gas supply network and alternative sources of energy. Beneficiaries of public aid will include investors in re-electrification projects, local authorities representing rural dwellers interested in obtaining supplies of gas and householders and others who install alternative sources of energy.

T.1.1.5. Network of local roads.

Although the overall density of farm utility roads is sufficient in most provinces (voivodships), their technical standards need to be upgraded, both in terms of spatial planning and surface quality. The planned target is to modernise 80 thousand km of communal and farm utility roads by 2006.

T.1.2. Improvement of social infrastructure in rural areas

T.1.2.1. Activities aimed at improving the educational system in rural areas

The low educational levels of rural people is the main barrier to structural adjustment and rural development. Overcoming this problem is thus a priority area of government policy and considerable funds will therefore be assigned to improve the situation. Short and medium term measures aimed at improving education in rural areas will be implemented by a partnership of the competent Ministries of Education and Agriculture.

Incentives for teachers working in rural areas.

High quality teachers are necessary to improve rural education. Teachers of subjects in high demand (foreign languages, information technology, science and finance) should have some incentive to work in rural areas.

The proposed measures include:

- a fund to provide supplements to teachers who specialise in deficit subjects and who undertake to work in rural areas for at least 5 years;
- credit to support teachers with establishment costs.

Teaching equipment to enable proper vocational training.

The upgrading of instructional processes requires modern equipment in teaching classrooms, especially for subjects such as languages, finance, book keeping, computing and accessing information (*inter alia* through the Internet). Equipment in existing school workshops will be gradually modernised in line with the available resources to enable students to become familiar with novel technologies.

Transport facilities for commuting students

It is proposed to finance school-bus transportation for children from areas with no primary schools to those that have such schools. It is also proposed to provide secondary school pupils with such public transport facilities that will allow them to commute to school quickly.

Stipend aid

It is necessary to provide scholarships for rural youths who learn or study outside their place of residence. Local authorities, the government and non-governmental organisations (NGOs) should contribute to this form of assistance. The support system will be aimed at reimbursing the costs of boarding, commuting, purchase of school manuals and school fees.

Bank guarantees to young rural people (e.g. from Agency of Restructuring and Modernisation of Agriculture – ARMA) should give them better access to credit.

T.1.2.2. Mobilisation of local communities

In the last decade, great efforts have been made to mobilise local resources, often with remarkable results. People at the level of the communes have established organisations to support local development, supported in some cases by the GMINA programme. There is evidence of the vital role of local self-governments and spontaneous self-organisation for the development of local business activities. Support for local societies, mainly at the commune level, will create conditions for natural self organisation and local collaboration.

Greater involvement of local communities in the development process will be encouraged by:

- establishing regional partnerships for local initiatives (business support centres):
- establishment of legal, economic and tax consulting services,
- training in the creation of local leaders,
- support for using local development potential,
- setting up local partnership networks.

T.1.2.3. Activities to upgrade health care standards in rural areas

Within the framework of the ongoing reforms of health policy in Poland, it is planned to create family health units. These units are based on co-operation between a family doctor, a community nurse and a social worker. The installation of family health groups within local communities will facilitate regular communication with actual and potential patients. Moreover, such units should speed up the diagnosis of pathological phenomena, improve the efficacy of prophylactic measures, and actively assist in health promotion within well understood family environments. The institution of a family doctor may become the most important element in pursuing the health objectives specified in the *National Health Programme*.

In order to raise health care standards for the rural population, the following priorities have been established:

- large scale health education;
- prevention of diseases, in particular the occupational diseases of farmers, by means of a system of detection, diagnosis and identification;
- better access to medical services;
- improved legislative and information activities about occupational safety and hygiene standards in agriculture;
- providing health centres and doctors' surgeries in villages and small towns with diagnostic and therapeutic equipment;
- intensified activities to improve the state of the environment and of drinking water especially, of harmful pesticides and their residues.

T.1.2.4. Reform of farmers' social insurance system

The ongoing implementation of the reforms to the social welfare system also includes amendments to the social insurance system for farmers. This system provides pensions and disability allowances. According to the adopted framework, farmers will continue to be covered by a social insurance system that is separate from all other vocational groups. Its rationale is to enhance rural structural change and to ensure that farmers have fair conditions of social security.

Since the budget subsidy will support only definite structural and social goals, it is assumed that the major changes in the amended act will cover disability and old-age pensions, and they will concern in particular:

- establishment of more rational rules for farmers' contributions in the system's financing – the contribution will vary according to achieved incomes or owned farming acreage;
- the maximum possible correlation of the farmers' social insurance scheme with the adopted changes in the general state insurance scheme, ZUS (Institution of Social Insurance), including the principle of creating insurance capital, while maintaining the specificity of the agricultural system,
- introduction of mechanisms to stimulate structural change in agriculture.

One of these mechanisms will be an early-retirement scheme prepared along the lines of the existing EU scheme.

T.1.3. Better conditions for economic activities and job creation outside agriculture

Incentives to encourage economic activities in rural areas focus primarily on business development and job creation outside agriculture.

Incentives to economic activities will cover non-agricultural activities in rural areas, agri-food processing and marketing, rural tourism and initiatives enhancing the value of rural areas as a place to live.

Support to enterprises and business initiatives in rural areas will continue to be given by the following means:

- incentives to investors and business people,
- an improved system of guarantees and securities for loans,
- preference to be given to investment projects that improve the physical infrastructure,
- promotion of the countryside as an attractive place to invest,
- financial support and economic advice for starting new businesses,
- loans, credits and subsidies for business projects which create new jobs,
- support for "self-employment" in the form of very small loans or "micro-loans".

Support will be granted on condition that the proposed projects observe environmental rules and do not undermine sustainable rural development. The level of support for economic activities in rural areas will vary in accordance with the regional differences in needs reflected in development strategies.

T.2. Restructuring the agrarian sector

T.2.1. Improved agrarian structure

The effectiveness and competitiveness of the Polish agri-food sector can be greatly strengthened by improvements in the structure of the industry and increasing the average farm size. Improvements in agrarian structure in the form of fewer larger farms with more consolidated land holdings will involve changes in land ownership brought about either by sale and purchase or some other form of transferring cultivation rights e.g. by exchange. Improvements in the distribution of land can also be achieved by giving private farmers priority if they wish to farm land owned by the State treasury, or by allowing existing farmers to settle on State land in exchange for their current land holdings. Similarly, the constraints on land transfer between generations can be improved by the system of structural pensions.

The State continues to give support for land purchase, especially for young farmers, so as to stimulate an increase in farm size. Measures will be taken to make it easier under civil law to complete transactions on the sale and purchase of land by farmers who are adequately qualified and who intend to increase the size of their holdings. The process of land consolidation and exchange will be accelerated.

Another element of the management of the State Treasury Agrarian Property is the introduction of limited tenders for purchase or lease of agrarian property. The tenders will be addressed only to farmers willing to increase the size of their holdings, former employees of state farms, repatriates, persons who fulfil the requirements defined in the agricultural settlement programme, farmers who handed over their farms to the State Treasury for public purposes or members of production co-operative societies who intend to establish a farm. The tenders will be addressed to one or more of the groups.

T.2.2. Instruments for farm modernisation

Farm modernisation, which is needed to increase production efficiency together with improved quality, sanitary and environmental standards, are key measures to improve the competitiveness of Polish agriculture. The most effective investments will be those upgrading production facilities throughout the food chain, starting with farming, through processing and on to the retail level. Improved efficiency resulting from more modern and larger farms, together with the benefits of more joint action taken by producer groups, should result in agricultural producers having a stronger position in the marketing chain.

State assistance for farmers to adjust to the requirements of a market economy will target only those holdings with marketable produce: it will assist their adjustment to the market, both in terms of efficiency and quality. The following measures are involved:

- interest rate subsidies on credit for farm modernisation, and in particular for the adoption of new technology, both in primary production and processing,
- grants for investments aimed to improve produce quality and sanitary conditions,
- guarantees for investment credits,
- free specialist consulting services for agricultural production, the setting up and management of holdings, business and finance, marketing;
- assistance with farm accounting,
- preferences given to benefits from instruments of agrarian structural improvement (first option on land from the state resources),
- exemption from taxes and subsidies for landscape preservation for marginal land taken out of agriculture.

Producers who have contracts to deliver produce to agricultural and food processing plants, or to other customers for agricultural materials and products, will be given priority for the above types of support.

Small farmers with low output but efficient production will only be supported financially if they organise themselves into mutual interest groups; mainly by support for self-organising producers' groups which, for example, share machines, buy and sell inputs and outputs together or adopt common quality standards.

To be eligible for public support for farm modernisation, beneficiaries must be able to demonstrate some of the following outcomes:

- they will produce high quality agricultural products,

- they will reduce production costs,
- some of their activities will be carried out in association with other farmers,
- they will adopt organic production and/or enhance environmental protection,
- they will produce agricultural products for industrial use,
- they will develop or set up activities which provide alternative sources of income including agro-tourism, handicraft or on-farm processing enterprises,
- they will produce traditional or regional products,
- they will rationalise energy consumption.

T.2.3. Strengthening the position of farmers on agricultural product markets

The aim of strengthening the position of farmers in the food chain is especially important given the much more competitive environment brought about, for example, by the rapid growth of hyper-markets in food retailing. Producer groups have an important role in primary markets and their activities will be fostered by legal sanctions and State financial support. Wholesale or secondary markets have been developing more or less successfully for several years now. The State will strengthen and accelerate its support based on the existing, considerable, allocation of funds. The responsibility for organising and financing regional markets will rest with the new regional governments.

The State will also assist in improving the overall efficiency of agricultural markets by:

- improving the systems of collection, processing and dissemination of market information,
- the establishment of institutions dealing with agricultural and food product promotion.

T.2.3.1. Support for producer groups, and financial management consulting services

The law on agricultural producer groups, and the support measures for assisting groups and associations of agricultural producers, envisages various types of farmers' organisations as being an essential part of the agricultural and food marketing regime. Moreover, farmers' organisations and groups will be an important influence on the size of farms and the form of agricultural output. The benefits of this restructuring should improve the economic efficiency of farming and help to supply good quality, and possibly low-cost, products.

A registered group of agricultural producers (i.e.meeting the minimum legal requirements) will be able to apply for preferential credits and public subsidies to help them pursue the statutory goals of the groups and their associations.

T.2.3.2. The restoration and development of agricultural co-operatives

The planned governmental measures are mainly amendments to the law that will lead to equal treatment of farmer-owned agricultural co-operatives, private farms and producers' groups. This will encourage the co-operatives that are already operating in rural communities to change their practices; it will also stimulate farmers to establish new co-operatives controlled by themselves and thus to act in their economic interest. The purpose of the act on agricultural co-operatives, the draft of which is now being prepared by the MARD, is to speed up the reforms in keeping with mainstream organisational trends.

T.2.3.3. Support to agricultural market infrastructure

The Government plans are to concentrate on the existing "Programme for the Establishment and Development of Wholesale Markets and the Warsaw Commodity Exchange". The Ministry of Agriculture and Rural Development, having drawn on the experience of existing EU Member States, intends to support the development of the infrastructure for market institutions such as market information, market promotion and trade and distribution institutions. However, the Government intends to further concentrate public assistance used for these purposes into larger institutions so as to facilitate the management and control of funding.

T.2.3.4. Support to the system of market information

The Ministry of Agriculture and Rural Development has taken steps to establish an integrated market information system with PHARE support. The project seeks to establish a system together with the required hardware and software. Data about the market, consisting of commodity prices, and the state of supply and demand at different levels of the food marketing chain, will be gathered. The system will be co-ordinated by the Ministry of Agriculture and Rural Development as part of its statutory activities. The information will be collected at no extra charge by numerous institutions such as the Chief Inspectorate of Agricultural Purchasing and Processing, commodity exchanges, wholesale markets, agricultural and food processing plants etc. The system will be compatible with EU requirements in terms of data collection and transmission etc.

T.2.3.5. Support for organisations promoting agricultural and food products.

It is planned to set up appropriate government or NGOs to promote Polish agricultural and food products on domestic and foreign markets. According to a draft new law the system will initially be co-financed from public sources. EU experience demonstrates that the promotion of agri-food products can be worthwhile.

It is envisaged that planned Polish food marketing institutions will receive public financing for the initial five years. Annual allocations will be provided for in the budget.

T.2.4. Implementation of biological improvement

Biological improvements are one of the main ways in which Polish agriculture can be developed. It involves the introduction of new, more efficient plant varieties and animal breeds, and new methods of utilising natural conditions.

Co-financing by the State of plant and animal breeding will be carried out in the following ways:

- direct subsidies for plants and animals breeding tasks; pursued by creators of those plant and animal breeds that are annually defined as preferable,
- direct subsidies for certified plant and animal breeding material,
- subsidies for operations defined as government procurement such as the evaluation of breeding material, artificial insemination of farm animals and the maintenance and development of strategic animal species and varieties of plants.

T.3. Sustainable development of rural areas, protection of the natural environment and cultural heritage

Protection of the natural environment and resources constitutes an integral part of structural and rural development policy. Natural resources are not only a necessary input in agriculture but also a vital part of the heritage for the whole of society.

Adoption of a new policy framework in respect of agriculture and rural areas with stronger emphasis on environmental issues will help to:

- address environmental issues related to agriculture;
- develop new farm development activities in regions displaying high scenic and natural values (for instance in the Less Favoured Areas, mountains or areas which are or will be legally protected) and also where nature conservation may constitute the basis for tourist development;
- preserve the variety of genetic resources of Polish livestock and crops;
- address problems of marginal land management;
- change the agricultural production in polluted areas from food to commodities with industrial uses, such as alcohol and oils.

Instruments to attain these objectives will basically consist of the following:

- investment support aimed at environmental improvement;
- subsidies for farmers who apply agricultural production methods designed to protect the environment;
- subsidies for farmers who plant forests on farmland;
- training and demonstrations.

T.3.1. Support for investment in environmental protection

Actions to improve water quality

Support instruments, financed partly from public sources, for the protection of water quality will include: subsidies towards the construction or renovation costs of farm household waste disposal; installations and equipment for the proper storage (i.e. safe for the environment and for people) of natural fertilisers and silage in the form of manure slabs; liquid manure and silage effluent tanks; household drainage connections. The draft act on fertilisers and fertilising has been prepared, and includes an obligation to build such installations within 5 years from the effective date of the act.

Actions designed to protect soils

In the case of the control of soil erosion, public funds will be used for the construction (and restoration) of reservoirs (including silted-up reservoirs), as well as investments connected with land property consolidation (for instance access roads).

Actions designed to improve water retention using small installations.

In order to improve water retention, subsidised investments will be available for the construction of small dams, pools and ponds, sluice gates and culverts. Subsidies will also be available for the planting of trees and grass on eroded land.

Actions designed to maintain landscape values and rural heritage

In order to maintain and improve the landscape, subsidies will be granted to reimburse the costs of planting trees in open areas to create shelter-belts to prevent soil erosion. The costs of introducing landscape elements to improve the water balance or the ecological quality of the land will also be eligible for such subsidies, together with the costs of maintaining traditional rural buildings.

In addition, local authorities will also be eligible for assistance (from the central budget, the EU and other sources) for investments in infrastructure aimed at environmental protection. They will be able to use it for the construction of sewage systems, sewage treatment plants and for the renovation and creation of waste dumping sites, including those for packaging and for the residues of plant protection products.

T.3.2. Subsidies for farmers applying agricultural production methods designed to protect the environment

As environmentally-friendly farming methods tend to be less profitable than traditional ones, farmers are to be encouraged to adopt them by paying them compensation for the lower income and additional costs incurred. This approach is consistent with EU legislation.

In Poland, direct payments will be granted to:

- farmers who apply the recommended farming methods in areas of high landscape value, such as National Parks, designated parts of Landscape Parks and other areas subject to future legal protection,
- farmers adopting appropriate farming methods in less favoured areas (LFA),
- farmers who undertake activities intended to reduce water pollution and land erosion or to improve water retention and other landscape elements,
- farmers who carry on organic farming or switchover to such farming methods and who apply integrated production methods,
- farmers who rear rare species of animals or grow rare crops,
- farmers who invest in energy-saving facilities or machines for cultivation and treatment of crops which are particularly useful for environmentally-friendly farming (swing and reversible ploughs, cultivating sets, weed removers, fertiliser distributors for precision sowing, safe spraying machines).

T.3.3. Subsidies for farmers who plant trees on arable land

The aim of the National Programme for Afforestation, which has been in existence since 1995, is to afforest 700,000 hectares before the year 2020. At present, about 18,300 hectares per year are being afforested, mainly on low quality agricultural land transferred from the State Treasury Agricultural Property Agency to the State Forestry Management.

The Government plans to increase expenditure on afforestation and to introduce incentives for afforestation for private landowners. To this end, the National Programme for Afforestation will be supplemented with subsidies for farmers in line with EU Legislation. Amendments of the programme are being worked out jointly by the Ministry of Environmental Protection, and the Ministry of Agriculture and Rural Development, in accordance with the priorities of the National Programme of Preparation for EU membership.

Payments for farmers undertaking to afforest their land (depending on the regional situation and funds available) will be made in the form of co-financing subsidies to reimburse:

- planting costs,
- maintenance costs, in the first 5 years of forest cultivation,
- investment expenditures for forest infrastructure (fire breaks, water intake points, forest roads etc.).

T.3.4. Support to training and demonstration activities

Education, training and demonstration projects are deemed to be one of the best methods to help protect the natural environment in agricultural areas in Poland. The training will cover the following topics:

- dissemination of Codes of Good Agricultural Practices,
- statements about the dangers for the natural and cultural environment resulting from agriculture, and about ways of counteracting those dangers,

- methods of recording the use of fertilisers and plant protection products and agro-technical treatments,
- protection and enrichment of biodiversity on farms,
- beneficial production methods for the natural environment (systems of integrated production and organic farming, rational utilisation of abandoned land).

T.3.5. Protection and promotion of rural heritage: folk art and handicrafts, as well as folklore and regional traditions

The value of the cultural uniqueness of the different Polish regions, as revealed in traditional folk art and handicrafts, is to be protected and promoted through State support. Incentives for the promotion of the broadly defined rural heritage (handicraft, crafts, music, traditions and ceremonies) have been, and will continue to be, an important element of State cultural policies. The wealth of traditions and Poland's rural culture should be carefully maintained and developed, not only by local communities, but also by national institutions. In particular support will be targeted for indigenous culture such as art, handicraft and music.

Appendix Poland 4.2

Pillars and their aspects in the Pact for Agricultural and Rural Areas

P.I. Support for agriculture and its environment

P.1) Intervention in the market of selected agricultural products

In the year 2000 intervention was concentrated on wheat, rye, butter, skimmed milk powder, pig meat, starch, honey and rape. In the year 2001 a new intervention instruments will be implemented to provide:

- Licenses for the export of pig meat, skimmed milk powder, starch and sugar,
- Subsidies for private storage of butter and pig meat,
- Production fees charged on sugar beet and sugar producers,
- Monitoring of sugar reserves and system of fees dedicated to storage and storage of sugar compensation,
- Subsidies for milk consumption in kindergartens and schools,
- Subsidies to Extra-grade milk.

From 2002 the following instruments will be implemented:

- Licenses for export and import of the rest of the products included in EU intervention system;
- Extension of intervention mechanisms to other grains,
- Subsidies for extended processing of butter and skimmed milk powder used as fodder,
- Milk quota administration system,
- Subsidies for production of sugar used as raw material in the chemical industry and for non-food use.

The implementing institutions will be: Ministry of Agriculture and Rural Development (MARD), Ministry of Finance(MF), Agricultural Market Agency (AMA), Ministry of Economy(ME), in agreement with farmers organizations. **Financing**: State budget, AMA budget, pre-accession assistance. After accession EU funds.

P.2) Turnover credit for agriculture

subsidies to interest rates on preferential credits for buying-up basic farm products and purchase of means of production for farmers.

As foreseen in the negotiation position of Poland, such support will be continued for 5 years after the accession of Poland to the EU (in the case of purchase of means of production). Subsidies for buying-up basic farm products will be gradually withdrawn when the private storage system will start to be implemented and interest rates on commercial credits decline.

Implementing Institutions: MARD, MF, Agency for Restructuring and Modernisation of Agriculture (ARMA) in co-operation with banks which have agreements with ARMA.
Financing: State budget.

P.3) Investment in agricultural holdings (especially aimed at farm modernization and product quality improvement):

- subsidies to interest rates on preferential credits for investments in agricultural holdings included in the dairy sector restructuring programme, purchase of machines for common use included in the same program,
- subsidies to interest rates on preferential credits for investments in agricultural holdings included in the SAPARD Operational Programme for Poland in Measure 2 (Investments in agricultural holdings), Measure 4-componenet 4.3 (Diversification of economic activities in rural areas providing for multiple activities and alternative income), Measure 5 (Agri-environmental measures and afforestation (pilot projects)).

Implementing institutions: MF, MARD, ARMA, Ministry of Environment.
Financing: State budget and SAPARD funds.

P.4) Improvement in farm land structure:

- subsidies to interest rates on preferential credits for purchase of arable land up to 100 ha,
- subsidies to interest rates on preferential credits for the creation, or equipping, of agricultural holdings included in the settlement programme
- subsidies to interest rates on preferential credits for young farmers,
- concentration and exchange of arable land,
- structural pension system,
- promotion of multi-annual renting of land.

After accession with FEOGA funds:

- structural pension system for farmers,
- compensatory payments for farms situated on LFA,
- agri-environmental measures,
- afforestation.

Implementing institutions: MARD, ARMA, The State Agricultural Property Agency (SAPA).
Financing: State budget, SAPARD funds, SAPA funds.

P.5) Improvement in efficiency of protection against excessive or subsidized agricultural products imports

In the pre-accession period Poland will apply instruments for the protection of Polish markets according to commitments agreed at the GATT/WTO Uruguay Round and described in international agreements signed by Poland.

Implementing institutions: MARD, ME, Plant Protection Inspection Service, Veterinary Inspection, Agricultural and Food Quality Inspection, AMA.
Financing: Implementation will not increase the expenditure of public funds.

P.6) Support for the creation of producer groups

Support for creation, and the first years of operational costs, of producer groups will be grant aided under the Polish act on producer groups and their associations, following changes in other acts accepted by the Polish Parliament on 26 September 2000. In addition, investments made in favour of producer groups or their associations by the food processing industry as well as the investments of the producer groups will be financially supported by SAPARD Operational Programme for Poland under Measure 1 (Improvement in processing and marketing of food and fishery products).

Implementing institutions: MARD, ARMA, Agricultural Chambers, farmers organisations.
Financing: State budget, SAPARD funds.

P.7) Development and up-to-date organization of agricultural market

On base of "Program for setting up and development of major sales markets and Warsaw Commodity Exchange – stage I" and "Coherent Structural Policy for Agricultural and Rural Development".

Implementing institutions: MARD, AMA, ARMA, SAPA (land), local governments, farmers organisations, Agricultural Chambers, Competition and Consumer Protection Service.

P.8) Biological progress:

- subsidies to qualified sowing material,
- subsidies for plant's and animal's gene bank,
- subsidies for selected breeders and breeding units,
- partial co-financing of herd books, spreading of high value animal breeds,
- partial co-financing of research for the improvement of the breeding quality of animals, biotechnology of reproduction, methods of feeding and maintaining of animals,
- subsidies to scientific research in plant breeding,
- subsidies for research to ensure adequate genetic material for organic agriculture,

After the accession:

- subsidies for biological progress implementation in animal and plant production,
- co-financig of scientific research in agriculture and implementation of its results.

Implementing Institutions: MF, MARD, State Committee for Scientific Research.
Financing: State budget

P.9) Tax regulations in agriculture

Implementing Institution: MF.
Financing: State budget

P.10) Modernisation of food-industry and improvement food products quality:

- subsidies to interest rates on preferential credits for the food industry,
- subsidies to interest rates on preferential credits for the creation of new non-agricultural jobs for rural areas inhabitants,
- subsidies to interest rates on preferential credits for "Program for Restructuring of Dairy Sector",
- Grants foreseen in the SAPARD Operational Programme for Poland under Measure 1 (Improvement in processing and marketing of food and fishery products).

Implementing institutions: MARD, ME, Ministry of the Treasury, ARMA, regional (voivodes) governments, food industry.
Financing: State budget, SAPARD funds.

P.II. Development of entrepreneurship and creation of non-agricultural jobs

P.11) Creation of business areas in gminas (communes)*

Implementing institutions: Gminas, MARD, ARMA, Regional Development Agency, NGO's, self-governments, SAPA, Agricultural Chambers, Ministry for Regional Development and Construction, Agricultural Extention Service.
Financing: State budget, regional government budget, additionally after accession Structural Funds.

* Since January 1st , 1999 there is a new territorial division in Poland. It consists of 16 Voivodships (Provinces), 308 Poviats (Districts), 65 cities with Poviat status and 2,489 Gminas (Communes).

P.12) Improvement of road net, access to water supply system, drainage, sewage, gas and electricity

Implementing institutions: MARD, Ministry of Environment, Ministry of Transport and Maritime Economy, ARMA, SAPA.
Financing: State budget, self-governments budget, pre-accession funds (SAPARD, ISPA) in the future Structural Funds.

P.13) Improvement of telecommunication system

Implementing institutions: Gminas and/or local companies founded for initiation of telecommunication development on rural areas. Additionally Government's Plenipotentiary for Telecommunication on Rural Areas, ARMA.
Financing: Gmina's budget, private contribution, pre-accession funds and (in the future) Structural Funds.

P.14) Investment in natural environment protection

- Measures for waste management,
- Measures for the neutralisation of dangerous waste,
- Water protection,
- Land for environment protection infrastructure,
- Implementation of Good Agricultural Practice,
- Vocational training for farmers concerning environmental protection.

Implementing institutions: MARD, Ministry of Environment, ARMA, SAPA, Gminas, Voivodships.
Financing: State budget, Gminas budgets, environment protection funds, Bank of Environment Protection credits, pre-accession funds (SAPARD, ISPA) and after accession Structural Funds.

P.15) Other investments in modernization (modernisation of existing infrastructure)

Implementing institutions: Local governments, SAPA, ARMA.
Financing: State budget, pre-accession funds, land (SAPA) and after accession Structural Funds.

P.16) Improvement in availability of external capital for small and medium sized enterprises:

- Implementation of regulations facilitating application of leasing, credit guarantees and public assistance for private sector,
- Extension of accessibility of credit guarantees for small and medium enterprises,
- Co-financing of investments in new technologies and increasing the competitiveness of small and medium enterprises,

- Preferential credits and subsidies for new jobs creation,
- Micro-credits addressed to microenterprises, unemployed, employed in agriculture switching to non-agricultural jobs.

Implementing institutions: Ministry of Justice, MF, ME, National Economy Bank, SAPA, Ministry of Labour and Social Affairs, MARD, local governments, foundations, NGOs.
Financing: State budget, local governments budget, foundations, World Bank Loan, SAPA budget, pre-accession funds and after accession Structural Funds.

P.17) Improvement of accessibility of information for small and medium sized enterprises:

- Promotion and facilitation of accessibility of national and EU regulations to small and medium enterprises (SME),
- Creation of national and foreign public procurements in order to facilitate participation of SME in public contracts,
- Collecting and processing of foreign offers for SME and offers of SME for export.

Implementing institutions: Ministry of Labor and Social Affairs, MARD, ME, The Office of Public Procurement, Ministry of Foreign Affairs, Agencies for rural Development, local governments, Agricultural Chambers, farmers organisations, business support centres, Ministry of Labor and Social Affairs, National Economy Bank.
Financing: State budget, pre-accession funds and in the future Structural Funds.

P.18) Extension service and vocational training

Implementing institutions: ME, Ministry of Labour and Social Affairs, Regional Extension Centres, Local Extension Service, local governments, Agricultural Chambers, farmers organisations, local and regional development agencies, SAPA, Ministry of National Education, Polish Banks Association, NGOs.
Financing: State budget, training participants, pre-accession funds and in the future Structural Funds.

P.19) Support for Export:

- subsidies to interest rates on preferential credits for medium and long-term export credits,
- Simplification of rules for export credits insurance (for SME) managed by Export Credit Insurance Corporation Co,
- Subsidies for participation of SME in fairs and trade missions abroad,
- Export subsidies.

Implementing institutions: ME, MF, MARD, ARMA, AMA, ECIC Co., Polish Fund for Promotion and Development of Small and Medium Enterprises, regional government, trade chambers.

Financing: State budget, AMA budget, ECIC Co. budget, foreign assistance funds and in the future Structural Funds.

P.20) Promotion of investments in rural areas

Implementing institutions: Gminas, Poviats, local and regional development agencies, NGOs, Agricultural Chambers.
Financing: local governments budgets, pre-accession funds, NGOs and in the future Structural Funds.

P.21) Development of a network of local institutions supporting entrepreneurship:

- Subsidies for the activities of local institutions, development of consulting services for SMEs based on a National Service System,
- Subsidies for the creation and activity of producer groups.

Implementing institutions: ME, Polish Fund for Promotion and Development of Small and Medium Enterprises, MARD, local governments, ARD, Agricultural Chambers, SAPA, Extension service, ARMA, NGOs, producer groups, rural co-operatives.
Financing: State budget, ARMA budget, local governments budget, pre-accession assistance funds and in the future Structural Funds.

P.22) Development of tourism and agri-tourism in rural areas:

- Law establishment for agri-touristic and tourist activity,
- subsidies to interest rates on preferential credits for investments and subsidies to investments in agri-tourism and tourism in rural areas,
- promotion of agri-tourism and tourism in rural areas in Poland and abroad.

Implementing institutions: MARD, Ministry of Transport and Maritime Economy, ME, Ministry of Health, MF, ARMA, Agricultural Chambers, Polish Tourism Organisation, Polish Federation of Rural Tourism, extension service, State Treasury foundations, RDA, NGOs.
Financing: Local governments budgets, pre-accession assistance funds and in the future Structural Funds.

P.23) Development of modern food-processing industry and storage:

- Broader access for credits and loans for food-industry,
- Modernisation and restructuring of existing food-industry and improvement in marketing of their products.

Implementing institutions: MARD, ARMA.
Financing: Investors contribution, pre-accession assistance funds and in the future Structural Funds.

P.24) Improving levels of youth education:

- Grants, credit guarantees, loans and students credits for young people living in rural areas applying to secondary and high schools,
- Advisory service for youth choosing future profession,
- Development of vocational training services and vocational training in order to facilitate adjustment of rural areas inhabitants professional skills to market demand,
- Rising the level of education in rural schools by continuous vocational training of rural teachers.

Implementing institutions: Ministry of National Education (MNE), Gminas, Poviats, local governments, NGOs, extension service.

Financing: State budget, SAPA, ARMA, National Economy Bank, local governments budgets, pre-accession assistance funds and in the future Structural Funds.

P.25) Development of adults continuous education system:

- Vocational training,
- Vocational training for local rural leaders,
- Vocational training for unemployed graduates in rural areas in order to adjust their non-agricultural skills to **market demand.**

Implementing institutions: MNE, MARD, Poviats, SAPA, extension service, ARMA, State Treasury foundations, NGOs, Agricultural Chambers, employment-office, local government.

Financing: State budget, local governments budgets, pre-accession assistance funds, World Bank loan and in the future Structural Funds.

P.26) National Program for Afforestation Enhancement:

- Afforestation of State and private-owned land,
- Subsidies to afforestation of private land, week arable land.

Implementing institutions: State Forestry, SAPA, MARD, ARMA, Ministry of Environment.

Financing: State budget, Forest Fund, funds for environmental protection, pre--accession assistance funds and in the future Structural Funds.

P.27) Program for water management infrastructure arrangements including drainage system

Investments in drainage system as new jobs for rural inhabitants.

Implementing institutions: Gmina's, Poviat's and Voivodship's governments.

Financing: State budget and local government budgets.

P.28) Public works included in unemployment reduction programs

Implementing institutions: local governments and National Employment Office.
Financing: State budget and local governments budgets.

P.III. Support for complex social policy for agriculture and rural areas and improvement of living conditions on rural areas

P.29) Education of kindergarten children

Implementing institutions: MNE, local governments.
Financing: State budget, local government budgets.

P.30) Modernization of primary schools

Implementing institution: MNE, local governments.
Financing: State budget, local government budgets.

P.31) Creation of modern colleges

Implementing institution: MNE, local governments, State Sports Administration (SSA).
Financing: State budget, local governments budgets and special funds of SSA.

P.32) Increase the accessibility of secondary schools to youths living in rural areas and improving the standards of secondary schools in rural areas

Implementing institution: MNE, local governments.
Financing: State budget and local governments budgets.

P.33) Establishment and development of universities and improvement in their accessibility for youth originating from rural areas

Implementing institution: MNE, local governments.
Financing: State budget and local governments budgets.

P.34) Grant and credit system for students

Implementing institution: MNE, local governments, universities, National Economy Bank, ARMA, MARD.
Financing: State budget, universities, local governments budgets.

P.35) Training and practice for teachers

Implementing institutions: MNE, local governments, National Center for Supplementing Teachers' Education at the Ministry of National Education, Regional Methodological Centers for Teachers.
Financing: State budget and non-budget resources.

P.36) Contracts for teachers working in rural areas

Implementing institutions: MNE, local governments.
Financing: State budget, part of the general subsidy allocated for educational purposes.

P.37) Supporting the institutions and cultural and sport initiatives in rural areas

Implementing institutions: Ministry of Culture and National Heritage, MNE, State Sports Administration, local governments.
Financing: State budget, local governments budgets, special funds of SSA.

P.38) Improvement in quality and accessibility of social security for rural areas inhabitants:

- Health prophylaxis,
- Vocational training and practices for doctors and nurses,
- Practice for individuals and groups for basic health-care personnel in rural areas.

Implementing institutions: MH, Patient's Sickness Funds, Rural Medical Institute, Post Graduate Training Centre for Nurses and Midwives, local governments.
Financing: State budget.

P.39) Promotion and assurance of work hygiene and safety conditions in rural areas

Implementing institutions: MARD, The Fund for Social Insurance for Farmers (FSIF), MH, National Labour Inspectorate, Ministry of Labour and Social Affairs.
Financing: The FSIF Fund for prevention and Rehabilitation, State budget.

P.40) social help for rural areas inhabitants:

- Improvement in social help for older and sick people living in rural areas,
- Improvement in social help for children living in rural areas,
- Advisory for families living in rural areas.

Implementing institutions: Ministry of Labour and Social Affairs, local governments, Patient's Sickness Funds, National Fund for Rehabilitation of Handicapped.
Financing: State budget, local governments budgets, Patient's Sickness Funds, National Fund for Rehabilitation of Handicapped.

P.41) Improvement in farmers social security system

Implementing institution: MARD.
Financing: State budget.

P.42) Health, social and professional rehabilitation of handicapped rural areas inhabitants:

- Creation of strategy,
- Advisory,
- Rehabilitation,

Implementing institutions: MH, Ministry of Labour and Social Affairs, local governments, National Fund for Rehabilitation of Handicapped, FSIF.
Financing: State budget, local governments budgets, National Fund for Rehabilitation of Handicapped funds, The FSIF Fund for Prevention and Rehabilitation, Patient's Sickness Funds, Labour Funds.

P.IV. Institutionalisation of partnership and social dialog in the area of agriculture and rural areas

In order to prepare Polish agriculture and rural areas to join and participate in the European Union, and to assure coordination and necessary Pact modifications, during its realisation, the following bodies will be created:

P.43) Secretariat of Polish Rural and Agricultural Organisations for Integration and Cooperation With EU

The Secretariat will be established on the basis of decision of participants of Pact for Agriculture and Rural Areas in Brussels. The role of the Secretariat will be to promote Polish rural areas and agriculture in EU organisations and institutions and support Polish rural and farmers organisations in their activities on EU forums. Initially, in the pre-accession period, the Secretariat will be financed by State budget.

P.44) Polish Agriculture Forum

The Forum will be established to prepare Polish agricultural sector to integration with EU, solve problems and conflicts concerning Polish agriculture, based on dialogue between social partners. The Forum will be formed by representatives of:

- Agricultural trade unions,
- Agricultural sectors organisations,
- Agricultural employees and employers,
- Agricultural Chambers,
- Agricultural co-operatives,
- The government.

P.45) Rural Development Council

The Rural Development Council will be in charge of measures foreseen under Pillars II and III of the Pact. The Council will be formed by representatives of:

- Social organisations contributing to rural development,
- Agricultural Chambers,
- Local governments,
- The government.

The council will work in co-operation with Polish Agriculture Forum.

Appendix Poland 4.3

Priority Axes, Measures and Scheme details of the SAPARD Operational Programme for Poland

Table A1. List of the Measures/Schemes/Components

Measure	Scheme	Component	Page
1. Improvement in Processing And Marketing of Food and Fishery Products			
	1.1. Capital Grants Scheme for Processing Products of Animal Origin Including Fish		
	1.2. Support for Restructuring the Processing and Improving the Marketing of Fruit and Vegetable Products		
2. Investments in Agricultural Holdings			
	2.1. Restructuring of Milk Production		
	2.2. Modernisation of Specialised Livestock Farms		
		2.2.1. Modernisation of Beef Cattle Farms	
		2.2.2. Restoration of Sheep Production	
		2.2.3. Modernisation of Pigs and Poultry Production	
	2.3. Diversification and Valorisation of Agricultural Production		
3. Development of Rural Infrastructure			
	3.1. Water Supply for Rural Households Including Water Purification		
	3.2. Waste Water Purification and Disposal		
	3.3. Solid Waste Management		
	3.4. Gmina and Poviat Roads in Rural Areas		
	3.5. Energy Supply		
	3.6. Rural Telecommunication		
4. Diversification of Economic Activities in Rural Areas			
	4.1. Capital Grants Scheme for Investment in Rural Diversification		
		4.1.1. Supporting the Additional Sources of Sustainable Income for Farms	
		4.1.2. Job Creation Scheme for Rural Dwellers	
		4.1.3. Enhancing the Attractiveness of Rural Areas for Tourism	
	4.2. Marketing and Promotion of Diversification of Economic Activities in Rural Areas		

Measure	Scheme	Component	Page
5. Agri-Environmental Measures And Afforestation (Pilot Projects)			
	5.1. Agri-Environmental Measures (Pilot Project)		
	5.2. Afforestation (Pilot Project)		
6. Vocational Training			
7. Technical Assistance			

Priority Axis 1: Improvement of the Efficiency of the Agri-Food Sector

Measure 1: Improvement in Processing and Marketing of Food and Fishery Products

Scheme 1.1: Capital Grants Scheme for Processing Products of Animal Origin Including Fish
Scheme 1.2: Support for Restructuring the Processing and Improving the Marketing of Fruit and Vegetable Products

Measure 2: Investments in Agricultural Holdings

Scheme 2.1: Restructuring of Milk Production
Scheme 2.2: Modernisation of Specialised Livestock Farms

Component 2.2.1: Modernisation of Beef Cattle Farms
Component 2.2.2: Restoration of Sheep Production
Component 2.2.3: Modernisation of Pigs And Poultry Production

Scheme 2.3: Diversification and Valorisation of Agricultural Production

Priority Axis 2: Improvement of Conditions for Economic Activities and Job Creation

Measure 3: Development of Rural Infrastructure

Scheme 3.1: Water Supply for Rural Households Including Water Purification
Scheme 3.2: Waste Water Purification and Disposal
Scheme 3.3: Solid Waste Management
Scheme 3.4: *Gmina* and *Poviat* Roads in Rural Areas
Scheme 3.5: Energy Supply
Scheme 3.6: Rural Telecommunication

Measure 4: Diversification of Economic Activities in Rural Areas

Scheme 4.1: Capital Grants Scheme for Investment in Rural Diversification

Component 4.1.1: Supporting the Additional Sources of Sustainable Income For Farms
Component 4.1.2: Job Creation Scheme for Rural Dwellers
Component 4.1.3: Enhancing the Attractiveness of Rural Areas for Tourism

Scheme 4.2: Marketing and Promotion of Diversification of Economic Activities in Rural Areas

Complementary Axis

Measure 5: ***Agri-environmental Measures and Afforestation (Pilot Projects)***

Scheme 5.1: Agri-Environmental Measures (Pilot Project)
Scheme 5.2: Afforestation (Pilot Project)

Measure 6: ***Vocational Training***
Measure 7: ***Technical Assistance***

Priority Axis 1: Improvement of Efficiency of the Agri-Food Sector

Measure 1: Improvement in Processing and Marketing of Food and Fishery Products

Schemes Under Measure 1

Scheme 1.1. Capital Grants Scheme for Processing Products of Animal Origin Including Fish
This aid scheme covers the sectors for: milk, meat (red and white) and fish processing.

Beneficiaries of the Scheme 1.1.
Beneficiaries will include businesses involved in milk and fish processing, slaughtering, cutting and processing of meat as well as agricultural and fishery producer groups and their associations.

Levels of aid under Scheme 1.1.
The maximum rate of aid is up to 50% of the total eligible costs. For industrial plants the level of aid cannot exceed 1,400,000 EUR over the programming period. In addition, a plant may receive in total up to 250,000 EUR for investments in favour of producer groups or by the producer groups and their associations.
The entity may apply for assistance several times over the duration of the Programme. However the minimum aid per project cannot be less than 30,000 EUR.

Scheme 1.2: Support for Restructuring the Processing and Improving the Marketing of Fruit and Vegetable Products

Beneficiaries of capital grants for Scheme 1.2.
Support may be given to fruit and vegetable processing plants and fruit and vegetable producer groups and their associations.

Levels of aid under Scheme 1.2.
The maximum rate of aid is up to 40% of the total eligible costs, but aid shall not exceed 250,000 EUR per plant during the programme implementation. With regard to the investments carried out by the agricultural producer's groups aid shall not exceed 500,000 EUR during the programme implementa-

Table A2

Investments	Sector	Rate of public assistance
Investments strictly aimed at adjustments to the EU requirements	Milk sector	50%
	Meat sector	40%
	Fish sector	40%
Investments strictly aimed at increased 'added value', quality improvement, etc.	Milk sector	40%
	Meat sector	30%
	Fish sector	30%
Investments strictly aimed at decreasing negative impacts on the environment	Milk, meat, fish sectors	30%

Table A3

Investments	Rate of public assistance
Investments strictly aimed at adjustment to the EU requirements	40%
Investments strictly aimed at increase of value added, quality improvement, etc	30%
Investments strictly aimed at decreasing negative impact on the environment	30%

tion period. The entity may apply for assistance several times over the duration of the Programme. However, the minimum aid per project cannot be less than 30,000 EUR.

The above targets have been set the expected breakdown of funds between sectors:

- milk: 35–45%
- meat: 30–40%
- fish: 5–15%
- fruit and vegetable: 10–20%

Measure 2: Investments in Agricultural Holdings

Schemes Under Measure 2

Scheme 2.1: Restructuring of Milk Production

Beneficiaries of aid for Measure 2.

Aid can be granted to a farmer (i.e. a natural person who is dealing in agriculture on his/her own account being the owner or tenant of a farm), and subject to social insurance on the basis of the Law on social insurance of farmers.

Level of aid for Scheme 2.1.

The rate of aid is 50% of eligible costs subject to a maximum grant of 20,000 EUR aid per applicant or 25,000 EUR aid where installing a manure tank is included.

Scheme 2.2. Modernisation of Specialised Livestock Farms

Component 2.2.1. Modernisation of beef cattle farms.

Level of aid for Component 2.2.1.
The rate of aid is 50% of eligible costs, subject to a maximum grant of 12,000 EUR aid per applicant or 17,000 EUR aid where a liquid waste tank is included.

Component 2.2.2. Restoration of sheep production.
Level of aid for Component 2.2.2.
The rate of aid is 50% of eligible costs, subject to a maximum grant of 12,000 EUR aid per applicant.

Component 2.2.3. Modernisation of pigs and poultry production.
Level of aid for Component 2.2.3.
The rate of aid is 50% of eligible costs, subject to a maximum grant of:
- 15,000 EUR aid per applicant in pig sector;
- 12,000 EUR aid per applicant in poultry sector.

Scheme 2.3: Diversification and Valorisation of Agricultural Production.

Level of aid for Scheme 2.3.
The level of aid is 50% of eligible costs, up to 12,000 EUR aid per beneficiary.

Priority Axis II: Improvement of Conditions for Economic Activity and Job Creation

Measure 3: Development of Rural Infrastructure

Schemes Under Measure 3

Rate of grant aid for Schemes 3.1 to 3.6.
The regulations are the same for all schemes 3.1 to 3.6. The amount of grant shall be in line with the Council Regulation 1268/1999 as well as with the Polish budgetary provisions set for supporting investments carried out by the local governments from the central budget* and as such it shall not exceed 50% of the total eligible costs; the grant might be increased to 75% according to current Polish law. The rate of grant aid lower than the statutory limits laid down in the Polish legislation and in the Council Regulation 1268/99; it will depend solely upon the needs indicated by the beneficiary.

Scheme 3.1. Water Supply for Rural Households Including Water Purification.
The upper ceiling of grant for a *gmina* under Scheme 3.1. is 200 000 EUR per investment.
The upper ceiling of grant for inter-*gmina* associations under Scheme 3.1. is the number of *gminas* participating in the association multiplied by 200,000 EUR per investment.

* As of today, *gminas* which: (a) deal with large-scale unemployment (structural unemployment), (b) have income in terms of per capita income below 60 per cent of the national average, (c) have on their territories former USSR military bases may be awarded a grant up to 75 per cent of the eligible investment costs, as laid down in the Self-Governments' Revenues Act over the period 1999 – 2000 of November 26, 1998.

Beneficiaries of aid under Scheme 3.1.
Gminas and inter-*gmina* associations*.

Scheme 3.2. Waste Water Purification and Disposal.
The upper ceiling of grant for a *gmina* under Scheme 3.2. is 400,000 EUR per investment.
The upper ceiling of grant for inter-*gmina* associations under Scheme 3.2. is the number of *gminas* participating in the association multiplied by 400,000 EUR per investment.
In the case of investments in on-farm waste water disposal and treatment facilities, the real estate owner will be required to contribute to the total project costs. Such investments will be financed only if there are no technical and economic grounds for the construction of a public waste-water disposal network. After such investment in individual farm and/or houses' and sewage treatment facility is completed, the real estate owner will cover all the operational costs. Contribution from inhabitant's own funds will be between 10 and 50 per cent of the total eligible cost of the project. The *Gmina* Council will set with its resolution the percentage of the personal contribution, equal for all real estates where the investment is to be put into effect.

Beneficiaries of aid under Scheme 3.2.
Gminas and inter-*gmina* associations.

Scheme 3.3: Solid Waste Management.
The upper ceiling of grant for a *gmina* under Scheme 3.3. is 300,000 EUR per investment.
The upper ceiling of grant for inter-*gmina* associations under Scheme 3.3. is the number of *gminas* participating in the association multiplied by 300,000 EUR per investment.

Beneficiaries of aid under Scheme 3.3.
G*minas* and inter-*gmina* associations.

Scheme 3.4: *Gmina* and *Poviat* Roads in Rural Areas.
The upper ceiling of grant for a *gmina* or p*oviat* under Scheme 3.4. is 100,000 EUR per investment.
In the case of investments in access roads to agricultural land, farmers whose fields will be connected to public road network will be required to contribute to the total project costs. Contributions from farmers' own funds will be between 10 and 50 per cent of the total eligible cost of project implementation. The *Gmina* Council will set with its resolution the percentage of the personal contribution, equal for all farm land owners.

Beneficiaries of aid under Scheme 3.4.
Gminas; Poviats.

Scheme 3.5. Energy Supply.
The upper ceiling of grant for a *gmina* under Scheme 3.5. is 100,000 EUR per investment.

* Inter-gmina association is aimed at joint implementation of gmina statutory public tasks and was defined in Gmina Self-Government Act of March 8, 1990.

The upper ceiling of grant for inter-*gmina* associations under Scheme 3.5 is the number of *gminas* participating in the association multiplied by 100,000 EUR per investment.

Beneficiaries of aid under Scheme 3.5.
G*minas* and inter-*gmina* associations.

Scheme 3.6: Rural Telecommunication.
Upper ceiling of grant for a *gmina* under Scheme 3.6. is 20 000 EUR for investment.
Upper ceiling of grant for inter-*gmina* associations under Scheme 3.6. is the number of *gminas* in the association multiplied by 20 000 EUR per investment.

Beneficiaries of aid under Scheme 3.6.
G*minas* and inter-*gmina* associations.

Geographical coverage of Measure 3.
This measure covers the whole territory of Poland except for towns and cities with more than 7,000 inhabitants.

Measure 4: Diversification of Economic Activities in Rural Areas Providing for Multiple Activities and Alternative Income

Schemes Under Measure 4

Scheme 4.1: Capital Grants Scheme for Investment in Rural Diversification.

Component 4.1.1. Supporting the additional sources of sustainable income for farms.

Beneficiaries of Component 4.1.1.
Natural persons: farmers, and household members (according to the Polish law on Social Security).

Levels of aid under Component 4.1.1.
Grants is 50% of the total eligible costs of the project subject to a ceiling of 6,000 EUR aid.

Component 4.1.2. Job creation scheme for rural dwellers.

Beneficiaries of Component 4.1.2.
Entrepreneurs* creating sustainable jobs for rural dwellers.

Levels of aid under Component 4.1.2.
Grant is 50% of the total eligible costs of the project subject to a ceiling of 6,000 EUR aid per one new full-time job equivalent, subject to a ceiling of 36,000 EUR per entrepreneur.

Component 4.1.3. Enhancing the attractiveness of rural areas for tourism.

Beneficiaries of Component 4.1.3.
NGOs**, *gminas* and inter-*gmina* associations.

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* As defined in Law on Economic Activity.

** The following entities are excluded: natural persons, informal groups, political organisations, trade unions, profit oriented economic units.

Level of aid under Component 4.1.3.
The grant is 50% of the total eligible cost of the investment, subject to a ceiling of 25,000 EUR aid. The upper ceiling of grant for inter-*gmina* associations under Component 4.1.3. is the number of *gminas* participating in the association multiplied by 25,000 EUR per investment.

Scheme 4.2: Marketing And Promotion Of Diversification Of Economic Activities In Rural Areas.

Beneficiaries of Scheme 4.2.
Formally registered non-governmental organisations, farmers organisations, self-governmental units, economic organisations, agricultural advisory centres, and other organisations not excluded in the footnote*.

Maximum level of aid Scheme 4.2.
The level of aid is 50% of the total eligible costs, subject to a ceiling of 100 000 EUR aid.

Geographical coverage of Measure 4.
This Measure will cover the whole territory of Poland. Component 4.1.1. and 4.1.2. covers the whole territory of Poland except for towns and cities with more than 7 000 inhabitants.

Complementary Axis

The complementary axis will improve the efficiency of all investment support to farmers granted under measure 1, 2, 4, and 5.

Preparation of target agri-environmental and afforestation programmes requires pilot implementations. They will enable to test theoretical assumptions relating to the measures proposed, to verify payment calculations and to establish measurable indicators of monitoring and programme implementation results control. Representatives of implementing bodies on national and regional level will be trained and relevant administrative procedures, including eligibility of application for participation, will be developed. Experiences gained will form the basis for the preparation of target programmes implemented throughout the country after accession to the European Union.

Adjustment of the Polish agricultural and rural sector needs to be reinforced by the enhancement of human capital in rural areas to prepare farmers to function in new market, legal and social conditions to be brought to Poland by its entry to the Single Market. Analysis of educational levels of farmers reveal a big scope for improvement in both management, efficiency improvements, as well as marketing skills in both conventional agriculture and outside.

Support under Technical Assistance will be directed towards ensuring the efficiency of Programme implementation, monitoring and control at the central, regional and local level and the effective targeting of Program beneficiaries.

* The following entities are excluded: natural persons, informal groups, political organisations, trade unions, profit oriented economic units, schools and research institutes, and their subsidiaries.

Measure 5: Agri-Environmental Measures And Afforestation (Pilot Projects)

Scheme 5.1. Agri-Environmental Measures (Pilot Project).

Beneficiaries of Scheme 5.1.
Under agri-environmental programmes payments will be made to farmers who have at least 3 ha farms (their own property or multi-annual leases) and comply with the requirements provided for in the contract over a 5-year period.
Joint applications by farmers farming on adjacent areas can also be made. No minimum size limit for organic holdings is required. Participants will also be obliged to attend training courses for 20 hours, to keep farm accounts and apply at least basic rules of good agricultural practices.

Level of support under Scheme 5.1.
Analyses to determine the amount of payment for farmers who participate in the agri-environmental measures have not been completed yet. They will be continued in the first stage of the pilot programme's implementation. Payments for farmers participating in the agri-environmental programmes shall be set taking into account: additional costs incurred and income foregone as a result of applying certain farming practices as well as incentives (up to 20% of income forgone and additional cost). Payments will only be set for practises going beyond the usual good agricultural practices. An average level of payments in the agri-environmental programme is estimated at 120 EUR/hectare. Maximum payments for non-organic holding will be up to 6,000 EUR per year (10,000 EUR per year for organic farms).

Scheme 5.2: Afforestation (Pilot Project).

Beneficiaries of Scheme 5.2.
The afforestation pilot project shall be open to farmers or farm tenants for whom farming is the main source of income and who undertake the afforestation measures on an area above 0.1 ha. The project will exclude farmers who avail themselves of an early retirement pension or have plantations of Christmas trees. Afforestation projects covering above 50 ha, especially afforestation of pastures, shall be subject to environmental impact assessments.

Level of support under Scheme 5.2.
The maximum payment for forest plantations, including amendments and supplements for the following year, is estimated at 1,500 EUR/ha. The upper limit of the reimbursed costs of protecting the forest plantation against animals, if necessary, can be equal to no more than 1,000 EUR/hectare. The average annual cost of maintenance of forest plantations is estimated at 100 EUR/ha.

Geographical coverage for Measure 5.
Measure 5 shall operate in selected areas.

Measure 6: Vocational Training.

Beneficiaries of Measure 6.

Final beneficiaries of Measure 6 are:
- agricultural extension centers and services,
- business support institutions and centers (non-profit-making),
- specialized training institutions, of which agricultural schools, vocational
- schools,
- universities and research and development centers and their subsidiaries,
- agricultural chambers,
- local authorities at gmina, district and voivodship level,
- farmers organizations and associations,
- producer groups and associations of producer groups,
- private training companies and consortia.

Ultimate beneficiaries of Measure 6 are:
farmers and other persons involved in agricultural activities and forestry activities and their conversion*.

Rates of aid under Measure 6.
The rate of public aid for training projects will be 100%.

Measure 7: Technical Assistance.

7.1. Action taken upon Commission's initiatives.
According to regulation Council No 1268/99, up to 2% of the Programme might be allocated to technical assistance undertaken upon Commission's initiative such as feasibility studies, exchange visits, controls and evaluations.

7.2. Complementary activities for Technical Assistance will be as follows.

7.2.1. Program management and monitoring:
- support for the central, regional and local institutions in the field of Programme implementation, monitoring, control and evaluation,
- initiation and support for local and regional development partnerships, and
- upgrading IT systems so as to ensure proper programme monitoring and control.

7.2.2. Information and publicity campaigns:
- information campaigns for potential beneficiaries and including support in project preparation and management and training to develop acquaintance with relevant *acquis communautaire*,
- preparation of suitable informational literature.

7.2.3. Studies and pilot projects:
- ancillary studies relating to the implementation of measures, covering amongst others efficiency of the implementation system, optimisation of project selection and evaluation, identification of development and market opportunities, drafting of technical specifications and others as required,
- preparation of farm development plans for agri-environmental and afforestation pilot projects and others,
- relevant pilot projects in areas related to measures being implemented.

* This includes household members, defined by Polish Law on Farmers Insurance (of 20 December 1990).

7.2.4. Evaluation:

- establishment of an Analysis and Evaluation Unit, with a view to monitoring and evaluating under a specific programme to be agreed in Partnership with the Commission.

Appendix Poland 4.4

Table 1. Animal genetic resources in Poland (as recorded in the end of 1999)

No	Name of population/breed/variety/ strain or line within given species	Number of females recorded (entered into herd/flock books*)	
		Number	%
	DAIRY CATTLE		
1.	Black and White	354489	93,5
2.	Red and White	18316	4,8
3.	Polish Simmental	3488	0,9
4.	Polish Red Purebred	220	0,1
5.	Polish Red Improved	1536	0,4
6.	Jersey	678	0,2
7.	Others	420	0,1
	TOTAL	379147	100,0
	BEEF CATTLE		
1.	Limousine (LMS)	2882	17,3
2.	Crossbreds LMS	4919	29,6
3.	Hereford (HEF)	2222	13,4
4.	Crossbreds HEF	438	2,6
5.	Charolaise (CHL)	1417	8,5
6.	Crossbreds CHL	1118	6,7
7.	Angus (AAG and RAG)	523	3,2
8.	Crossbreds AAG and RAG	161	1,0
9.	Simmental (SIM)	497	3,0
10.	Crossbreds SIM	1000	6,0
11.	Piemontese (PMT)	184	1,1
12.	Crossbreds PMT	266	1,6
13.	Salers (SAL)	650	3,9
14.	Crossbreds Blonde d'Aquitaine	196	1,2
15.	Synthetic Crossbreds	31	0,2
16.	Crossbreds Welsh Black	114	0,7
	TOTAL	16618	100,0
	HORSES		
1.	Małopolski	3366*	12,7
2.	Wielkopolski	6086*	23,0
3.	Silesian	2267*	8,6
4.	Noble Half-blood	3245*	12,2
5.	Coldblooded	9436*	35,6
6.	Polish Konik	431*	1,6
7.	Hucul	346*	1,3
8.	Thoroughbred	794*	3,0
9.	Arabian	530*	2,0
	TOTAL	26501*	100,0

No	Name of population/breed/variety/ strain or line within given species	Number of females recorded (entered into herd/flock books*)	
		Number	%
	PIGS		
1.	Polish Landrace	16210	51,7
2.	Polish Large White	10930	34,8
3.	Pietrain	1071	3,4
4.	Duroc	1240	4,0
5.	Hampshire	763	2,4
6.	Synthetic Line 990	678	2,2
7.	Puławy	286	0,9
8.	Belgian Landrace	73	0,2
9.	Złotniki Spotted	69	0,2
10.	Złotniki White	57	0,2
	TOTAL	31377	100,0
	SHEEP		
1.	Polish Merino	33818*	31,6
2.	Polish Lowland	25419*	23,8
3.	Wielkopolska	4609*	4,3
4.	Polish Corriedale	279*	0,3
5.	Uhrusk	200*	0,2
6.	Żelazna	200*	0,2
7.	Polish Longwool	829*	0,8
8.	Polish Sub-Carpatian	1762*	1,6
9.	Pomeranian	5847*	5,5
10.	Kamieniec	1634*	1,5
11.	Polish Mountain	10357*	10,0
12.	Polish Heath	1632*	1,5
13.	Świniarka	163*	0,1
14.	Leine	288*	0,3
15.	Kent	108*	0,1
16.	East Friesian	375*	0,3
17.	Romanov	85*	0,1
18.	Finn sheep	79*	0,1
19.	Olkusz	89*	0,1
20.	Ile de France	4429*	4,1
21.	Polish Blackheaded Mutton	3766*	3,5
22.	Suffolk	1994*	1,9
23.	Berrichon	2930*	2,7
24.	Bergschaf	130*	0,1
25.	Texel	177*	0,1
26.	Charolaise	98*	0,1
27.	Dorset Horn	38*	0,0
28.	White Alpine	93*	0,1
29.	Merino - Booroola	28*	0,0
30.	Colored variety of Polish Merino	109*	0,1
31.	Merino - Finn	442*	0,4
32.	Synthetic lines	2830*	2,6
33.	Backcross hybrids	2076*	1,9
	TOTAL	106913*	100,0

No	Name of population/breed/variety/ strain or line within given species	Number of females recorded (entered into herd/flock books*)	
		Number	%
	GOATS		
1.	White Improved	1707	53,0
2.	Saanan	451	14,0
3.	Fawn Improved	442	13,7
4.	Alpine	261	8,1
5.	Crosses with Toggenbur	22	0,7
6.	Unknown breed	340	10,5
	TOTAL	3223	100,0
	LAYING HENS		
1.	Leghorn	5541	16,2
2.	Rhode Island Red	8472	24,7
3.	Rhode Island White	9621	28,1
4.	Sussex	4376	12,8
5.	New Hampshire	1973	5,8
6.	Barred Rock	2577	7,5
7.	Polbar	166	0,5
8.	Green-Legged Partridge	966	2,8
9.	Yellow-Legged Partridge	557	1,6
	TOTAL	34249	100,0
	GEESE		
1.	Zatorska	213	3,4
2.	Biłgoraj	108	1,7
3.	Lubelska	152	2,4
4.	Kielecka	160	2,6
5.	Sub-Carpatian	150	2,4
6.	Kartuska	154	2,5
7.	Rypińska	157	2,5
8.	Suwalska	151	2,4
9.	Garbonosa	81	1,3
10.	Pomeranian	87	1,4
11.	Roman	122	2,0
12.	Landes SD-01	276	4,4
13.	ND12	260	4,2
14.	Slovak	114	1,8
15.	Gorkowska	75	1,2
16.	White Italian	3988	63,8
	TOTAL	6248	100,0
	DUCKS		
1.	Polish Pekin	2829	49,7
2.	English Duck	2162	38,0
3.	Mini Duck	125	2,2
4.	Khaki Campbell	105	1,8
5.	Danish Pekin	114	2,0
6.	French Pekin	141	2,5
7.	Orpington	111	1,9
8.	KhO1	110	1,9
	TOTAL	5697	100,0

No	Name of population/breed/variety/ strain or line within given species	Number of females recorded (entered into herd/flock books*)	
		Number	%
	COMMON FOXES		
1.	Silver	5819	96,0
2.	Red	105	1,7
3.	Polish Pastel	107	1,8
4.	Polish White Necked	28	0,5
	TOTAL	6059	100,0
	POLAR FOXES	9344	
	MINKS		
1.	Natural Dark	1837	70,9
2.	Pastel	610	23,6
3.	Platinum	25	1,0
4.	White Hedlunda	17	0,6
5.	Palomino	80	3,1
6.	Double Pearl	20	0,8
	TOTAL	2589	100,0
	POLECATS	30	
	RACCOON DOGS	686	
	NUTRIAS		
1.	Standard	764	45,2
2.	Greenland	620	36,6
3.	Pearl	25	1,5
4.	Black	176	10,4
5.	Sable	25	1,5
6.	Snow	25	1,5
7.	Ambergold	25	1,5
8.	Pastel	30	1,8
	TOTAL	1690	100,0

No	Name of population/breed/variety/ strain or line within given species	Number of females recorded (entered into herd/flock books*)	
		Number	%
	RABBITS		
1.	White Gigant	100	2,9
2.	Grey Gigant	749	21,5
3.	Black Gigant	7	0,2
4.	Germany Giant Spot	129	3,7
5.	White Big Lop	28	0,8
6.	Grey Big Lop	63	1,8
7.	Big Lop	5	0,1
8.	New Zealand White	1168	33,5
9.	New Zealand Red	196	5,6
10.	Danish White	38	1,1
11.	Californian	444	12,7
12.	French Silver	96	2,8
13.	Blue of Vienna	106	3,0
14.	White of Vienna	11	0,3
15.	Big Chinchilla	85	2,4
16.	Rex	12	0,3
17.	Castorrex	32	0,9
18.	Popielno White	30	0,9
19.	Termond White	142	4,1
20.	Dutch	6	0,2
21.	Black Tan	6	0,2
22.	Alasca	26	0,7
23.	Rabbit of White Guards hairs	4	0,1
24.	Rabbit of Bourgogne	6	0,2
	TOTAL	3489	100,0
	CHINCHILLAS standard & black and velvet	3121	

No	Name of population/breed/variety/ strain or line within given species		Number of females recorded (entered into herd/flock books*)	
			Number	%
	BEES			
1.	Carnica:	CT46	50*	6,0
2.		Cp	12*	1,4
3.		Cr	7*	0,8
4.		Ca	4*	0,5
5.		Cb (Sub-Carpatian)	26*	3,1
6.		Beskidka	51*	6,1
7.		Bałtycka	59*	7,0
8.		Marynka	15*	1,8
9.		N	9*	1,1
10.		T	10*	1,1
11.		SK	6*	0,7
12.		J	3*	0,3
13.		Kujawska	29*	3,5
14.		Tb	29*	3,5
15.		Ab	24*	2,9
16.		S	14*	1,7
17.		R	20*	2,4
18.		Dobra	55*	6,6
19.		Nieska	5*	0,6
20.		Kortówka	53*	6,3
21.		Niw	15*	1,8
22.		PWJOT	6*	0,7
23.		Alpejka	9*	1,1
24.		Jugo	8*	1,0
25.		CJ10	31*	3,7
26.		AlSin	44*	5,2
27.		CNT	21*	2,5
28.		PA	9*	1,1
29.	Caucasian:	KPW	14*	1,7
30.		W	10*	1,2
31.		Woźnica	8*	1,0
32.		Kp	10*	1,2
33.		Puławy	14*	1,7
34.		M	13*	1,5
35.		Pb	18*	2,1
36.		KBrz	16*	1,9
37.	Black bee (*A. mellifera mellifera*):			
		Kampinos	42*	5,0
38.		Augustów	22*	2,6
39.		Asta	26*	3,1
40.		North	15*	1,8
41.		Nor (Norway)	6*	0,7
	TOTAL			100,0

No	Name of population/breed/variety/ strain or line within given species	Number of females recorded (entered into herd/flock books*)	
		Number	%
	CARP		
1.	Gołyski	326	40,0
2.	Knyszyński	6	0,7
3.	Starzawski	85	10,4
4.	Zatorski	100	12,3
5.	Hungarian	87	10,7
6.	French	11	1,3
7.	Yugoslavian	2	0,2
8.	German	6	0,7
9.	Ukraine	12	1,5
10.	Israel	180	22,1
11.	Lithuania	0	-
	TOTAL	815	100,0
	RAINBOW TROUT		
1.	Strain of autumn spawn	560	15,7
2.	Strain of spring spawn	3010	84,3
	TOTAL	3570	100,0

Table 2. Populations included in animal genetic resources conservation programmes (end of 1999)

Name	Origin[1)]	Period of creation	Population size	Number of herds recorded	Number of animals recorded (entered into herd books*)		Trend in population size[2)]	Conservation priorities	Expected number of females
					females	males			
Cattle									
Polish Red Purebred	R	XIX	1000	16	220	20	M	1	750
Pigs									
Puławy	R	early XX	1000	21	286	45	R	1	500
Złotniki Spotted	R	50.	165	4	69	13	R	1	
Złotnikia White	R	1946-62	30	2	57	8	R	2	
Horses									
Hucul	R	1924		-	346*	72*	S	1	250
Polish Konik	R	1806	600	-	431*	122*	S	1	
Sheep									
Polish Heath	R	XVIII	2000	6	1632*	38	S	1	1500
Świniarka	R	XVIII	174	2	163	10	R	1	
Olkusz	R	30.	100	5	89*	16	S	1	
Merino-Booroola	I	1988	35	1	28*	5	M	1	
Colored variety of Polish Merino	W	1980-90	200	1	109*	14	S	1	
Colored variety of Polish Mountain	R	XV	1000	4	100	4	M	1	
Leine	I	50.	500	1	288*	38	S	2	
Uhrusk	W	1957	700	8	500*	30	M	2	
Wielkopolska	W	1948-77	7900 [3)]	43	4609*	144	M	2	

Żelazna	W	1954	269	1	189*	10	M	2	
Polish Corriedale	W	1955	2000 3)	9	279*	7	M	3	
Kamieniec	W	1965	2400 3)	17	1634*	70	M	3	
Pomeranian	W	70.	8000 3)	88	5847*	255	M	3	
Hens									
Polbar	R	1946	186	1	168	18	S	1	550
Green-Legged Partridge ZK	R	1923	567	1	507	60	S	1	
Green-Legged Partridge Z11	R	end of XIX	599	1	539	60	S	1	
Yellow-Legged Partridge	R	1960	617	1	557	60	S	1	
Leghorn G99	W	1960	614	1	554	60	S	1	
Leghorn H22	W	1960	666	1	546	60	S	1	
Rhode Island Red R11	W	1974	609	1	549	60	S	1	
Sussex S66	W	1950	596	1	536	60	S	2	
Rhode Island Red K22	W	1984	1129	1	1009	120	S	2	
Rhode Island White A33	W	1984	1766	1	1581	185	S	2	
Ducks									
Polish Pekin P33	R	1978	139	1	109	30	S	1	200
Mini Duck K2	W	1982	170	1	125	45	S	1	
Khaki Campbell Kh1	W	1971	140	1	105	35	S	1	
Danish Pekin P8	W	1978	164	1	114	50	S	1	
Pekin P11	R	1970	258	1	208	52	S	1	
Pekin P22	R	1962	248	1	195	53	S	1	
English Duck A1	W	1977	214	1	164	50	S	2	
English Duck A2	W	1977	118	1	88	30	S	2	
English Duck A3	W	1977	156	1	106	50	S	2	
French Pekin P9	W	1978	191	1	141	50	S	2	
Orpington O1	W	1979	151	1	111	40	S	2	

KhO1	W	1970	141	1	110	31	S	2	
Synthetic line A	W	1992	390	1	300	90	S	3	
Geese									
Zatorska	R	1961	263	1	213	50	S	1	200
Biłgoraj	R	1971	148	1	108	40	S	1	
Lubelska	R	1972	204	1	152	52	S	1	
Kielecka	R	1972	210	1	160	50	S	1	
Sub-Carpatian	R	1972	198	1	150	48	S	1	
Kartuska	R	1972	203	1	153	50	S	1	
Rypińska	R	1972	197	1	157	40	S	1	
Suwalska	R	1972	191	1	151	40	S	1	
Garbonosa	R	1977	111	1	81	30	S	1	
Pomeranian	R	1981	117	1	87	30	S	1	
Roman	W	1978	172	1	122	50	S	2	
SD01	W	1977	366	1	276	90	S	2	
WD02	W	1977	298	1	218	80	S	2	
ND12	W	1977	330	1	260	70	S	2	
Slovak	W	1981	164	1	114	50	S	2	
Gorkowska	I	1978	105	1	75	40	S	2	
Fur animals									
Polish Pastel fox	R	1972	193	1	107	75	S	1	200
Polish White Necked fox	R	1970	35	1	28	6	S	1	
Domestic polecat	R	60.	350	1	30	7	M	1	150
Popielno White rabbit	R	1950-85	180	1	30	15	S	1	100
Polish Beige Recessive chinchilla	R	1957	30	4	22	8	S	2	100
Bees									
Augustów	R		1400 families	4	140 families		M	1	200 families

Kampinos	R		1400 families	2	115 families		M	1	
faromanNorth	R	end of 50.	36 families	3	40 families		M	1	
Asta	R	end of 60.	150 families	2	100 families		M	1	
Carps									
Zatorski	R	1955	150	1	100	50	S	1	100
Starzawski	R	1976	202	2	85	34	S	1	
Gołyski	R	1954-56	730	2	219	13	S	1	
Knyszyński	R	1966	243	1	6	11	S	1	
Lithuania	I	1995	480	1	-	82	R	2	
Ukraine	I	1986	360	1	12	23	R	2	
Rainbow trout									
strain of autumn spawn	I	1962	560	1	102	458	S	1	100
strain of spring spawn	W	1986	3010	4	2150	860	R	1	

1) Origin: R – indigenous; W – created; I – import
2) Trend in population size: M – decreasing; S – stable; R – increasing
3) The selection programme based on upgrading using prolific breeds is carried out.

Annex

Table 1. Instruments of supporting development of agriculture and rural development including environmental protection measures

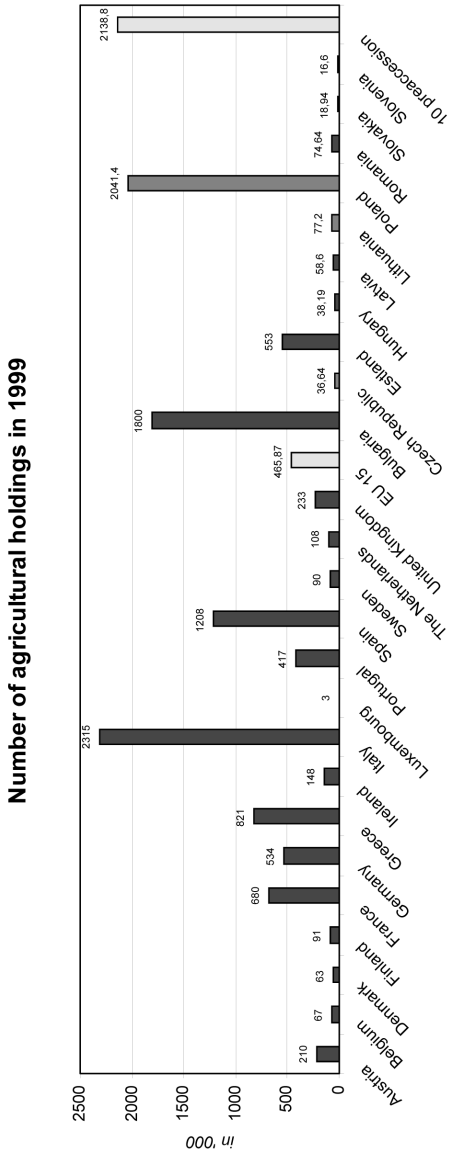
Instrument, donor	Country	Duration	Total budget	Average budget for each programme	Who is the beneficiary	Environment where it applies
SAPARD EU + CZ	Czech Republic	2000–2006 or till the date of accession of the Czech Republic to EU	154 Mio EUR from EU, more the state contribution 50 mil EUR (250 Mio CZK per year = 7,1 Mio EUR per year), more the private, not still clearly specified, contribution	There is not still the specified division of the finance between the Measures, the first use of SAPARD financing is supposed in automn 2001. 2/3 of finance going under the responsibility of the Ministry for local development, 1/3 the Ministry of Agriculture	Food processing industry, producer groups and their associations, farmers, municipalities, entrepreneurs NGOs	Environmental aspects must be taken into consideration under all measures, Directly only the agri-environmental measures can be considered as the biodiversity support
SAPARD EU + LT	Lithuania	2000–2006 or till the date of accession of Lithuania to EU	537,65 Mio EUR including private contribution	Measure 1 - 276 Mio EUR Measure 2 - 129 Mio EUR Measure 3 - 45 Mio EUR Measure 4 - 52 Mio EUR Measure 5 - 20 Mio EUR Measure 6 - 2,8 Mio EUR Measure 7 - 4,9 Mio EUR Measure 8 - 5,7 Mio EUR including private contribution	M1 – food processing industry, producer groups and their associations, farmers M2 – agricultural and other entities engaged in the processing of agricultural and fishery products M3 – farmers and private legal entities, registered in rural areas M4 – farmers and other agricultural entities; permanent rural dwellers; municipalities, if investments concerns water management systems M5 – private landowners or their associations and municipalities or their associations M6 – farmers – private landowners and long-term leasers M7 – legal entities engaged in science, studies, education, consultation and other activities M8 – legal entities responsible for conducting the operations	Directly M5, M6, Environmental aspects must be taken into consideration under all measures

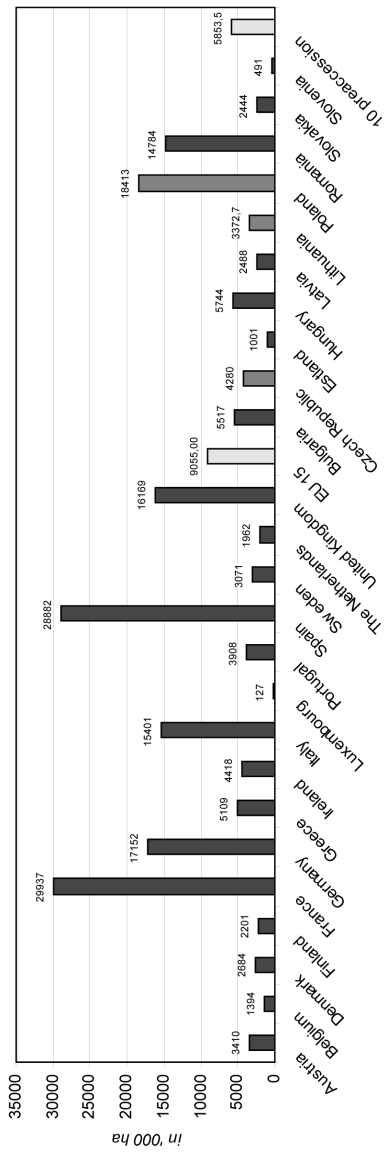
SAPARD EU + PL	Poland	2000–2006 or till the date of accession of Poland to EU	2 659 Mio EUR including private contribution	Measure 1 - 1 195 Mio EUR Measure 2 - 554 Mio EUR Measure 3 - 445 Mio EUR Measure 4 - 362 Mio EUR Measure 5 - 30 Mio EUR Measure 6 - 34 Mio EUR including private contribution	M1– food processing industry, producer groups and their associations M2 – Farmers M3- gminas, inter-gminas associations, poviats M4 – farmers, farm household members, entrepreneurs, NGOs, gminas and inter-gminas associations M5 – farmers M6 – farmers	Directly M5, Environmental aspects must be taken into consideration under all measures
Coherent Structural Policy for Rural Areas and Agriculture Development CZ + EU + World Bank	Czech Republic	2000–2006	- Yearly State budget; - Local democracy governments budget; - Sources from EU pre-accession assistance, - Private contribution (rural dwellers, businesses); - Structural Funds (after accession)	–	Local communities, farmers, private telecom operators, rural householders, rural youth, teachers, schools, investors, producer groups, local self-governments, Czech food marketing institutions	Sustainable development of rural areas, protection of the natural environment and cultural heritage are the principal aims of the activity
World Bank Private Agricultural Development Programme World Bank	Lithuania	1996–2001	30 Mio USD	–	Farmers, private small and medium enterprises in rural areas	-
Coherent Structural Policy for Rural Areas and Agriculture Development PL + EU + World Bank	Poland	2000–2006	Yearly State budget; Local self-governments budget; Sources from EU pre-accession assistance, Private contribution (rural dwellers, businesses); Structural Funds (after accession)	–	Local communities, farmers, private telecom operators, rural householders, rural youth, teachers, schools, investors, producer groups, local self-governments, Polish food marketing institutions	Under objective 3 Sustainable development of rural areas, protection of the natural environment and cultural heritag

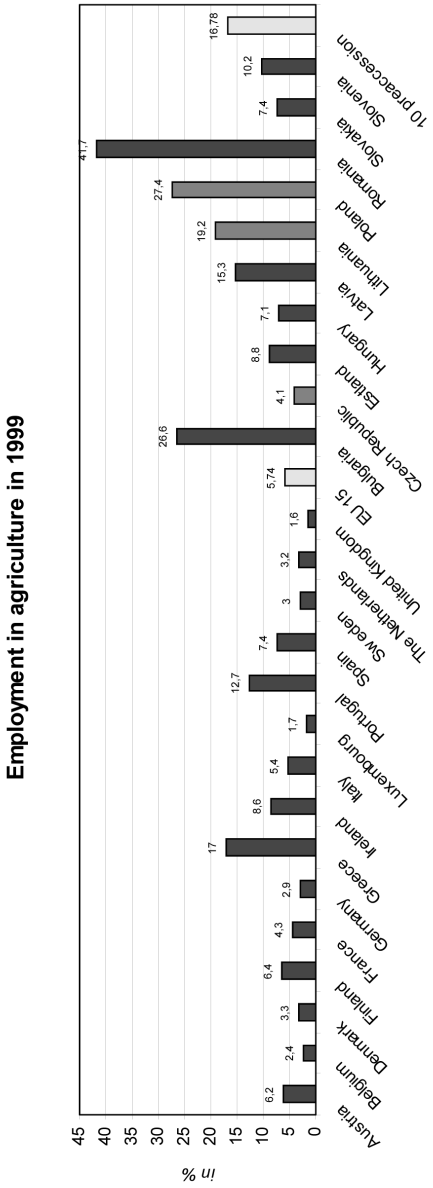
Agriculture Budget + EU + World Bank	Czech Republic	2001	13 920 360 thousand CZK (the external contribution is estimated about 13 000 thousand CZK - reality in 2000)			The Part of the budget going directly or non-directly to the support of environment is to be 6 840 000 thousand Kc
Special Rural Support Programme State budget	Lithuania	2001	265 997 thousand LTL	Organic farming – 500 thousand LTL	Farmers, agricultural enterprises	Includes direct payments for organic farming
Pact for Agriculture and Rural Areas State budget, Agencies budgets, state funds	Poland	2001, 2002	13 677 547 thousand PLN	Pillar I – 9 376 096 thousand PLN Pillar II – 3 734 272 thousand PLN in the year 2001 Pillar III – 562 238 thousand PLN in the year 2001 Pillar IV – 5 000 thousand PLN for the year 2001	Pillar I – farmers, producer groups, scientific institutions, food industry Pillar II – rural inhabitants, rural communities, SME, farmers, food industry Pillar III – schools, rural youth, teachers, medical staff, rural inhabitants Pillar IV – Polish agricultural sector and rural areas as a whole	Pillar II p.14 and 26
EU accession process, etape „Revitalisation" State budget, Agencies budgets, state funds	Czech Republic	2000, 2001, 2002	Lack of summarised data	Pillar A – Regulation of the market and the support of income Pillar B –Environmental measures Pillar C – Modernisation and transformation of the enterprises Pillar D – Common services and the preparation to the EU accession	Pillar A – farmers, producer groups, scientific institutions, food industry Pillar BI – rural inhabitants, rural communities, farmers, food industry Pillar C – farmers, rural inhabitants Pillar D – Polish agricultural sector and rural areas as a whole	

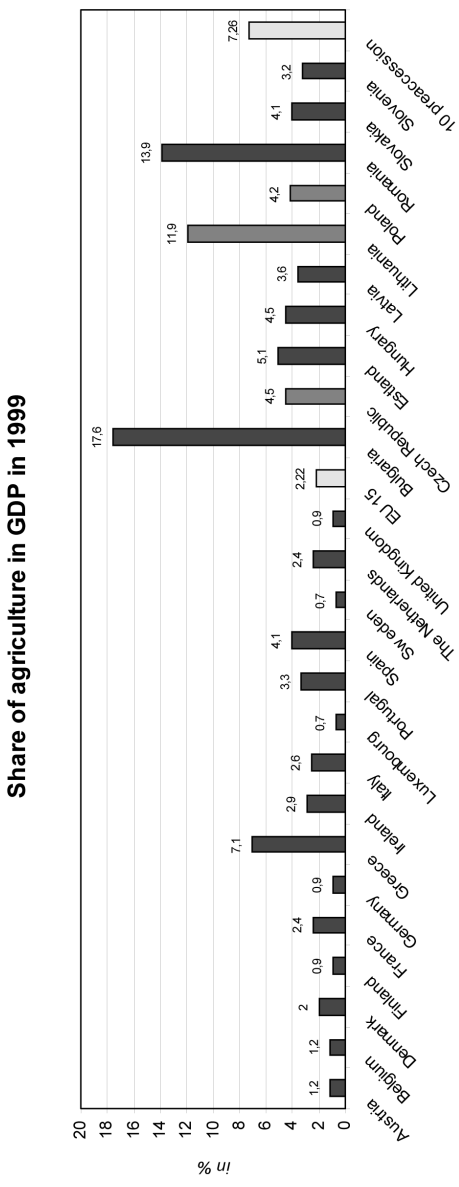
PHARE project Strengthening the Capacity of the Ministry of Agriculture and Related Institutions to Manage and Administer the EU Acquis for Agriculture (CAP) and Rural Development EU + LT	Lithuania	2001–2002	2 Mio EUR	The project is still under preparation	Ministry of Agriculture, Rural Credit Guarantee Fund, State Veterinary Service, State Plant Protection Service, State Laboratory of Milk Control, Lithuanian International Agricultural Trade Agency and other social and economic partners	Environmental aspects must be taken into consideration
Pact for Agriculture and Rural Areas State budget, Agencies budgets, state funds	Poland	2001, 2002	13 677 547 thousand PLN	Pillar I – 9 376 096 thousand PLN Pillar II – 3 734 272 thousand PLN in the year 2001 Pillar III – 562 238 thousand PLN in the year 2001 Pillar IV – 5 000 thousand PLN for the year 2001	Pillar I – farmers, producer groups, scientific institutions, food industry Pillar II – rural inhabitants, rural communities, SME, farmers, food industry Pillar III – schools, rural youth, teachers, medical staff, rural inhabitants Pillar IV – Polish agricultural sector and rural areas as a whole	Pillar II p.14 and 26

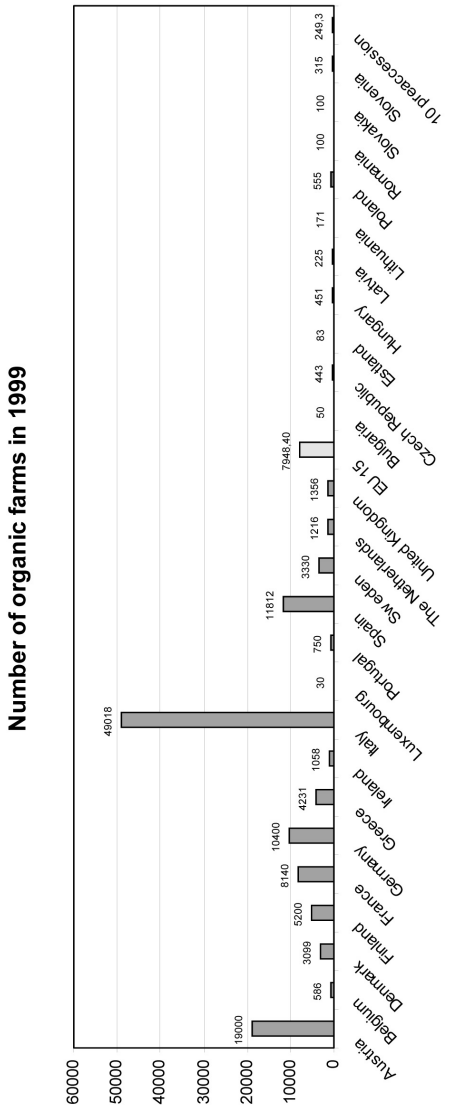
AGRICULTURE AND NATURE PROTECTION IN 15 EU and 10 PREACCESSION COUNTRIES												
Country	**Indicator for 1999**											
	No. of farms in '000 1997	**Agriculture land in '000 ha**	**Emplyment In agriculture in %**	**Agriculture in GDP in %**	**Agr. land for afforestation in %**	**Nature protect. Areas in %**	**Forests in %**	**No of plant species in flora**	**No of animal species in fauna**	**Abondoned land in '000 ha**	**No of organic farms**	**Area of organic farming in '000 ha**
Austria	210	3410	6,2	1,2							19000	272
Belgium	67	1394	2,4	1,2							586	18,5
Denmark	63	2684	3,3	2,0							3099	60,2
Finland	91	2201	6,4	0,9							5200	137
France	680	29937	4,3	2,4							8140	315,8
Germany	534	17152	2,9	0,9							10400	452,3
Greece	821	5109	17,0	7,1							4231	15,8
Ireland	148	4418	8,6	2,9							1058	32,5
Italy	2315	15401	5,4	2,6							49018	958,7
Luxembourg	3	127	1,7	0,7							30	1
Portugal	417	3908	12,7	3,3							750	48
Spain	1208	28882	7,4	4,1							11812	381
Sweden	90	3071	3,0	0,7							3330	184,2
The Netherlands	108	1962	3,2	2,4							1216	23
United Kingdom	233	16169	1,6	0,9							1356	240
EU 15	*465,87*	*9055*	*5,74*	*2,22*							*7948,4*	*209,33*
Bulgaria	1800	5517	26,6	17,6							50	0,5
Czech Republic	**36,641**	**4280**	**4,1**	**4,5**	**5**	**3,1**	**33,1**	**41000**	**30000**	**52**	**443**	**110**
Estland	553	1001	8,8	5,1							83	4
Hungary	3819	5744	7,1	4,5							451	34,5
Latvia	58,6	2488	15,3	3,6							225	20
Lithuania	**77,2**	**3372,7**	**19,2**	**11,9**	**0,3**	**11,5**	**30,7**	**16180**	**1796**	**—**	**171**	**4**
Poland	**2041,4**	**18413**	**27,4**	**4,2**	**20**	**22**	**28,2**	**11000**	**33066**	**—**	**555**	**9,5**
Romania	7464	14784	41,7	13,9							100	10
Slovakia	1894	2444	7,4	4,1							100	60
Slovenia	16,6	491	10,2	3,2							315	3
10 preaccession	*5436,5*	*5853,5*	*16,78*	*7,26*							*249,3*	*25,5*

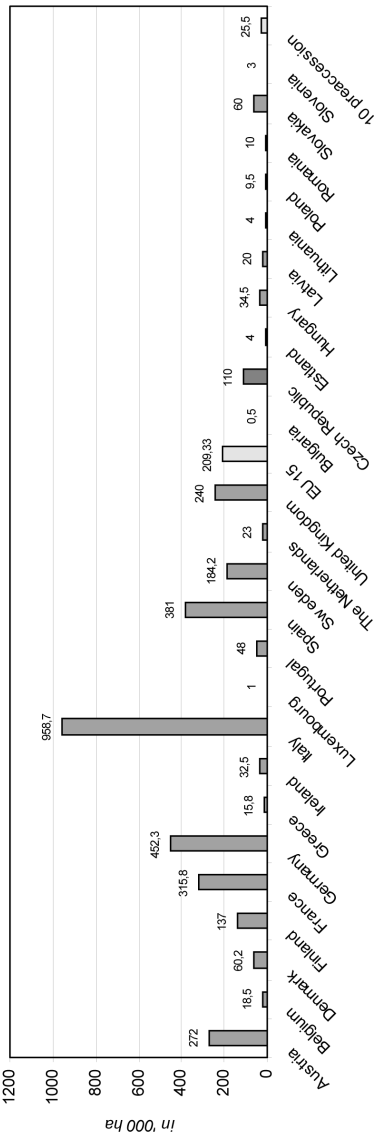

Number of agricultural holdings in 1999
in '000
2500
2000
1500
1000
500
0
Austria
Belgium
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Luxembourg
Portugal
Spain
Sweden
The Netherlands
United Kingdom
EU 15
Bulgaria
Czech Republic
Estland
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia
10 preaccession
210
67
63
91
680
534
821
148
2315
3
417
1208
90
108
233
465,87
1800
36,64
553
38,19
58,6
77,2
2041,4
74,64
18,94
16,6
2138,8

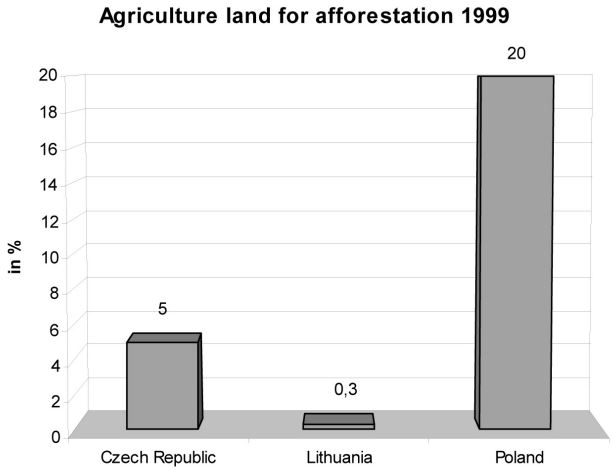

Agriculture land in 1999
in '000 ha
35000
30000
25000
20000
15000
10000
5000
0
Austria
Belgium
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Luxembourg
Portugal
Spain
Sw eden
The Netherlands
United Kingdom
EU 15
Bulgaria
Czech Republic
Estland
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia
10 preaccession
3410
1394
2884
2201
29937
17152
5109
4418
15401
127
3908
28882
3071
1962
16169
9055,00
5517
4280
1001
5744
2488
3372,7
18413
14784
2444
491
5853,5

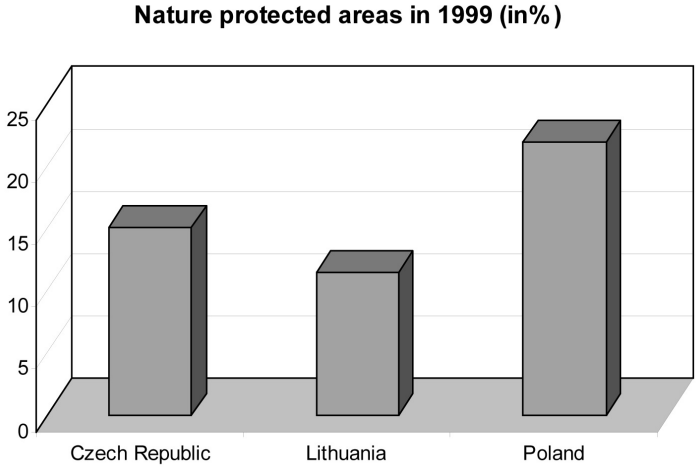

Employment in agriculture in 1999
in %
45
40
35
30
25
20
15
10
5
0
Austria
Belgium
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Luxembourg
Portugal
Spain
Sw eden
The Netherlands
United Kingdom
EU 15
Bulgaria
Czech Republic
Estland
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia
10 preaccession
6,2
2,4
3,3
6,4
4,3
2,9
17
8,6
5,4
1,7
12,7
7,4
3
3,2
1,6
5,74
26,6
4,1
8,8
7,1
15,3
19,2
27,4
41,7
7,4
10,2
16,78

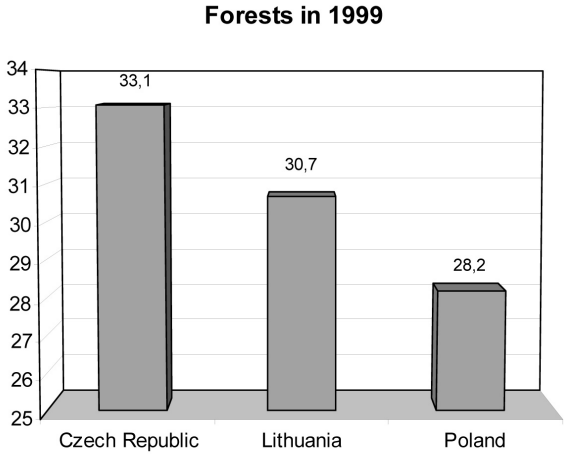

Share of agriculture in GDP in 1999
in %
20
18
16
14
12
10
8
6
4
2
0
Austria
Belgium
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Luxembourg
Portugal
Spain
Sw eden
The Netherlands
United Kingdom
EU 15
Bulgaria
Czech Republic
Estland
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia
10 preaccession
1,2
1,2
2
0,9
2,4
0,9
7,1
2,9
2,6
0,7
3,3
4,1
0,7
2,4
0,9
2,22
17,6
4,5
5,1
4,5
3,6
11,9
4,2
13,9
4,1
3,2
7,26

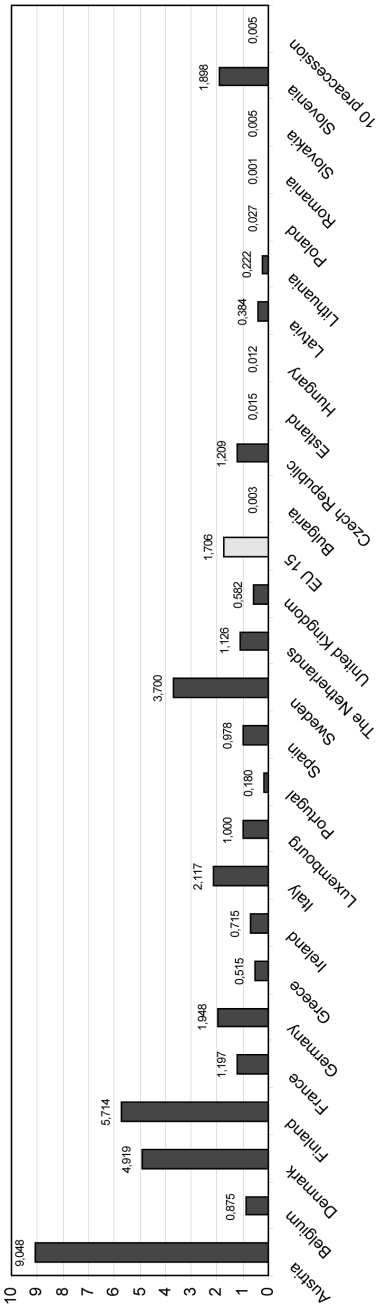

Number of organic farms in 1999
60000
50000
40000
30000
20000
10000
0
19000
586
3099
5200
8140
10400
4231
1058
49018
30
750
11812
3330
1216
1356
7948,40
50
443
83
451
225
171
555
100
100
315
249,3
Austria
Belgium
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Luxembourg
Portugal
Spain
Sw eden
The Netherlands
United Kingdom
EU 15
Bulgaria
Czech Republic
Estland
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia
10 preaccession

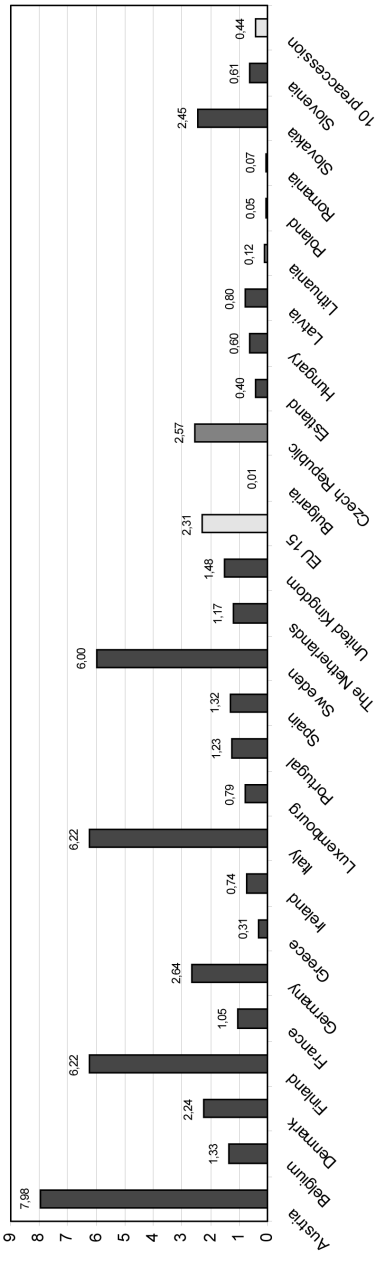

Area under organic farming in 1999
1200
1000
800
600
400
200
0
in '000 ha
272
18,5
60,2
137
315,8
452,3
15,8
32,5
958,7
1
48
381
184,2
23
240
209,33
0,5
110
4
34,5
20
4
9,5
10
60
3
25,5
Austria
Belgium
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Luxembourg
Portugal
Spain
Sw eden
The Netherlands
United Kingdom
EU 15
Bulgaria
Czech Republic
Estland
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia
10 preaccession


Agriculture land for afforestation 1999
in %
20
18
16
14
12
10
8
6
4
2
0
5
0,3
20
Czech Republic
Lithuania
Poland


Nature protected areas in 1999 (in%)
25
20
15
10
5
0
Czech Republic
Lithuania
Poland


Forests in 1999
34
33
32
31
30
29
28
27
26
25
33,1
30,7
28,2
Czech Republic
Lithuania
Poland


Organic farms as % of all holdings
10
9
8
7
6
5
4
3
2
1
0
9,048
0,875
4,919
5,714
1,197
1,948
0,515
0,715
2,117
1,000
0,180
0,978
3,700
1,126
0,582
1,706
0,003
1,209
0,015
0,012
0,384
0,222
0,027
0,001
0,005
1,898
0,005
Austria
Belgium
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Luxembourg
Portugal
Spain
Sweden
The Netherlands
United Kingdom
EU 15
Bulgaria
Czech Republic
Estland
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia
10 preaccession


Organic hectares as % of agricultural area
9
8
7
6
5
4
3
2
1
0
7,98
1,33
2,24
6,22
1,05
2,64
0,31
0,74
6,22
0,79
1,23
1,32
6,00
1,17
1,48
2,31
0,01
2,57
0,40
0,60
0,80
0,12
0,05
0,07
2,45
0,61
0,44
Austria
Belgium
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Luxembourg
Portugal
Spain
Sw eden
The Netherlands
United Kingdom
EU 15
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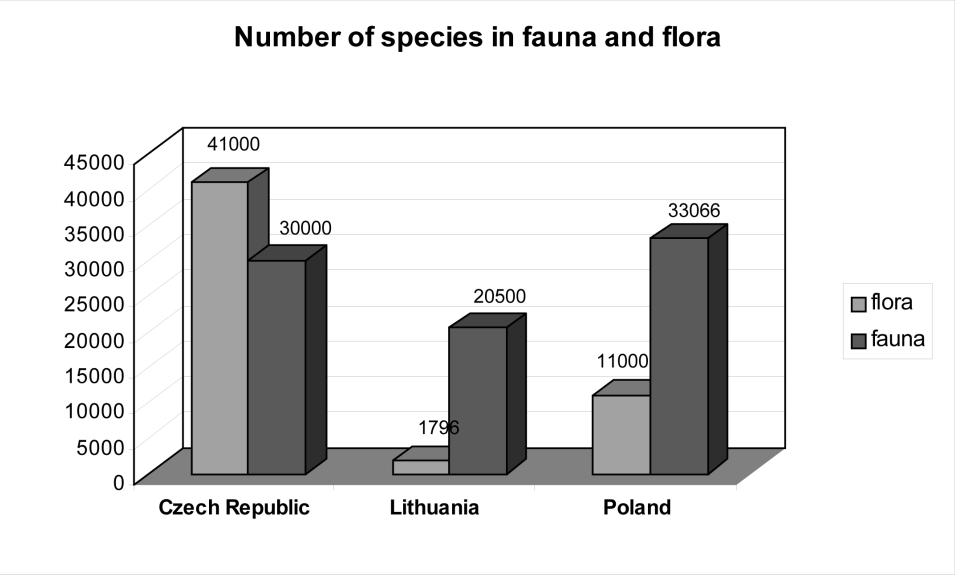
Poland
Romania
Slovakia
Slovenia
10 preaccession


Number of species in fauna and flora
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
41000
30000
1796
20500
11000
33066
Czech Republic
Lithuania
Poland
flora
fauna